ATTITUDES OF ACADEMIC STAFF AND STUDENTS TOWARDS INTERNET USAGE FOR ACADEMIC PURPOSES

IN ALZAWIA UNIVERSITY, LIBYA

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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

The University of Huddersfield

March 2017

Copyright statement

Abstract

The modern society is in the transition process from the Information Age to the Interaction Age so the attitude of academics and students towards Internet use is continuously changing. This study aims to investigate the attitudes of lecturers and students from Al-Zawiya University (AZU), Libya, towards the use of Internet technology for academic purposes and to formulate a set of recommendations for upgrading the quality and effectiveness of ICT implementation within the School of Engineering from AZU.

The action research approach is used to develop a novel framework for increasing the effectiveness of ICT implementation in AZU. The framework aims to improve the Internet skills of lecturers and students, increase the impact of the Internet on their academic efficiency, solve the problems they face while using the Internet, and increase their satisfaction with the Internet facilities provided by AZU. This new framework is built on the basis of different existing models and frameworks (a two-dimensional model for ICT integration in education, the ASSURE model, an framework for HE internationalisation, the ICube model for teaching and learning activities in modern Higher Education institutions).

The study includes an analysis of existing Internet use by academic staff and students which looks at various features of Internet usage, including purposes for using the Internet and users' level of satisfaction with the Internet facilities provided by the university. The SPSS package is employed for qualitative analysis of sixty students' answers to the questionnaires and shows that people's skills, computing resources and infrastructure influence the efficacy of integrating computers into HE. Semi-structured interviews are used to determine the attitudes of twelve academics towards use of the Internet in two departments – Department of English Language (DEL) and Department of Electrical Engineering (DEE). The qualitative analysis of academics' responses identifies the cognitive, performance and affective components of their outlook towards use of the Internet for teaching and research. In addition, the relationship between their answers and the research hypotheses shows that a combination of individual and social factors affects users' perspectives regarding Internet usage.

Finally, a set of recommendations for the enhancement of ICT implementation within the School of Engineering at Al-Zawiya University in Libya is formulated, aiming to enhance the quality of teaching, learning and research activities and the level of students' satisfaction with the technology-enhanced approach to learning. The findings of this thesis might be of interest to managers, academics and other people involved in the design and development of strategies for ICT implementation in Libyan universities and similar developing countries.

List of Publications:

As First name:

Elzawi, A. Wade, S., Kenan, T. and Pislaru, C., (2017). "Evaluation of the academics' attitude towards Internet usage in Libyan Higher Education". Proc of 8th International Conf. on Languages, Social Sciences, Education and Interdisciplinary Studies (ICLSSE-2017). London (United Kingdom) December 4-6, 2017. Accepted to be published.

Elzawi, A., Wade, S., Kenan, T. & Pislaru, C. (2013b). Exploratory study of the attitudes of academic staff in Libyan universities towards the role of the Internet. In Internet Technology and Secured Transactions (ICITST), 8th International Conference, London, pp. 490–493. doi: 10.1109/ICITST.2013.6750248.

Elzawi, A. Kenan, T., Wade, S., & Pislaru, C. (2013a). Internet and emerging information technologies in Libyan universities into reduce digital divide. International Journal of Information Technology & Computer Science (IJITCS) 12(1), 44-49. Retrieved from http://www.ijitcs.com/volume%2012_No_1/abdussala+elzawi.php.

Elzawi, A., Kenan, T., Wade, S., & Pislaru, C. (2012a). Bridging the digital divide and enhancing the quality of engineering research in Libyan universities. Unpublished paper presented at 6th Conference on Quality in Middle East, Hamden Bin Mohammed University, Dubai. Retrieved from http://eprints.hud.ac.uk/13668/.

Elzawi, A. & Wade, S. (2012b). "Barriers to ICT adoption in quality of engineering research in Libya: how to bridge the digital divide?". In proceedings of the queen's diamond jubilee Computing and Engineering Annual Researchers' Conf., University of Huddersfield, Huddersfield, pp. 98- 103.

Elzawi, A. & Underwood, J. (2010). "How higher engineering researchers in Libya perceive the use of internet technology". In the International Arab Conf. on Information Technology *(ACIT 2010),* University of Garyounis, Benghazi, Libya, pp. 89-97.

As Second name:

Kenan, T., Pislaru, C., Elzawi, A. & Wade, S. (2017). "A novel I-Cube model used to support the educational changes through technologies in modern Higher Education". Proc of 8th International Conf. on Languages, Social Sciences, Education and Interdisciplinary Studies (ICLSSE-2017). London (United Kingdom) December 4-6, 2017. Accepted to be Published.

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 Education research, 10 (1), pp.172-190. ISSN 1694-2116.

Kenan, T., Pislaru, C. & Elzawi, A. (2014). "Trends and Policy Issues for the e-learning implementation in Libyan Universities". International Journal of Trade, Economic and Finance (IJTEF), 5 (1), pp.105-109. ISSN: 2010-023X.

Kenan, T., Pislaru, C., Othman, A. & Elzawi, A. (2013C.). "The Social Impact and Culture Issues Affecting the e-learning performance in Libyan Higher Education Institutes". International Journal of Information Technology & Computer Science (IJITCS). 12(1), pp. 50-56.

Kenan, T., Pislaru, C., Elzawi, A. & Restoum, M. (2013B). "Improving the Effectiveness of Collaborative Learning Processes in Libyan Higher Education". ICITST-2013, 8th International Conference, London, pp. 411-416. doi:

10.1109/ICITST.2013.6750233.ISBN:978-1-908320-20-9.

Kenan, T., Pislaru, C., Othman, A. & Elzawi, A. (2013A). "Novel SWOT Analysis of e-learning implementation in Higher Education Institutes in Libya". International Journal of Elearning (IJEL): Association for the Advancement of Computing in Education (AACE), 2013.

Kenan, T., Pislaru, C. & Elzawi, A. (2012C). Analysing the effectiveness of e-learning based on national and international cultures and approaches to pedagogy. In 17th UKAIS Conference on Information Systems, New College, Oxford University.

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Posters:

Elzawi, A. Kenan, T., Wade, S. (2012). "Improvement the E-learning performance in the higher education in Libya". In: Dept. of Engineering and Technology, School of Computing and Engineering. 'Diamond Jubilee' Researchers' Conference-2012, 23 March 2012, University of Huddersfield, UK.

Kenan, T., Pislaru, C. and Elzawi, A. (2013) 'Investigation of e-learning implementation in HE institutions in Libya'. In: School Of Education and Professional Development Postgraduate Research Conference 2013, 6 March 2013, University of Huddersfield, UK.

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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.

Abdussalam Elarbi Elzawi

Acknowledgements

The Grace of Almighty Allah has blessed me blessed to complete this research.

I would like to express my gratitude to my supervisors Dr. Steve Wade and Dr. Crinela Pislaru for their excellent research support, guidance and encouragement over the course of this study.

I especially want to thank my wife Dr. Thuraya Kenan for her help and unlimited support.

I would like to thank all my family for their unconditional support and encouragement to pursue my study and their confidence in my ability. Thanks, are extended to my children for their patience during the period of this research.

My thanks must go to all my colleagues and friends in the research office for their discussion and arguments which have been informative and useful.

I deeply appreciate the support of my home country, Libya.

Finally, I am very grateful to all participants' students who gave much of their time to answering the questionnaire and all the academics who took part in the interviews.

List of abbreviations

The original words	The abbreviations
Al-Zawiya University	AZU
British Council Press Release Agreement	BCPRA
Cascading Style Sheets	CSS
Communications And Information Technology Commission	CITC
Computer Mediated Communication	CMC
Critical Success Factors	CSF
Department of Electronic Engineering	DEE
Department of English Language	DEL
Face-To-Face	F2F
General People's Congress	GPC

Gross domestic product	GDP
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
Revolutionary Command Council	RCC
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 state Amairica	USA
United States Dollar	USD
Virtual Learning Environment	VLE
World Trade Organization	WTO
World Wide Web	WWW

Chapter 1 - Introduction

The use of information technology in both developed and developing countries has been increasing at governmental, organisational and individual levels. The Internet has become a powerful technological tool that enables societies to use information technologies effectively for development processes (Benson & Ward, 2013). The HE sector is one of the most active areas in this respect, and societies have been utilising this tool extensively to improve the quality of educational outcomes. The necessity for adoption of the Internet by education organisations is mainly based on their needs to improve flexibility, to become part of a network, and to facilitate their educational processes and activities. Use of the Internet in HE institutions is thus a strategic and integral tool for improving the quality of education. Furthermore, it helps users to share relevant information and cope with rapid changes in education and other aspects of life.

In developing countries, universities are spending large amounts of money on adopting and using the Internet effectively to access international databases and other educational eresources. However, there is a huge gap in ICT adoption and usage between developed and developing countries, which is called 'the digital divide' (Elzawi, et al., 2012 and Abusrewel, 2014). The challenges related to ICT implementation in developing countries have been analysed by Adams & Winthrop (2011) and classified in several categories:

• Technical - poor quality of infrastructure, accessibility issues, etc.

• Economic - high costs associated with Internet access

• Political - lack of adequate policy and government regulations

• Human resources - limited availability of trained technical and academic staff, and

• Cultural - people in these societies consider the Internet a great threat to their societal and cultural values. Social and cultural aspects have significant associations with the adoption and use of information technology. Hung et al. (2002) have argue that while people do select some information technology applications, their culture may lead to conflicts with other applications. They also state that conformities or conflicts within the cultural norms of a group drive the process of cultural transformation in positive or negative ways.

Therefore, there is a need to further explore the relationship between the local cultural aspects and the attitudes of academics and students toward usage of the Internet for academic purposes. The conclusions of this study could be applied to the formulation of a framework for ICT implementation within universities from Libya and other developing countries, with the aim of increasing the effectiveness of teaching and learning activities.

This research study will be conducted in the context of Libya and its education system. Libya is a developing country, and like many other developing countries, Libya is facing various problems and issues in different sectors and areas. The education sector is suffering many difficulties, poor equipment and still depends on the traditional tools. The internet applications did not accredited yet in the higher curriculum level; the quality of education and the design and methods of the system are reputed at international level to be lacking, despite profound efforts by the government in recent times to improve the situation via different programmes (Kenan et al., 2012). A few universities in Libya have also focused on this aspect recently and, in collaboration with the Ministry of Higher Education, have tried to introduce educational and research programmes with the inclusion of IT (Adams & Winthrop, 2011). However, there is still a need for large scale improvements to be implemented to address the quality of the education system overall, which will have a profound impact across the country.

The main issue the development countries still suffer the weak ICT background which leads to weakness of all active areas in these countries. To check the real activity for the ICT performance, the start should be start from the education.

This research will undertake an investigation of the stated problem in Libyan universities and higher education context, which is a sensitive issue. It will also evaluate the role of information and communication technology in the Libyan education sector, and the attitudes of academic staff and students towards the use of Internet technology for teaching and research at Al-Zawiya University. In considering this issue, the research study aims to identify and address how information technology and the Internet can shape and improve the quality of education in the country.

Another problem within this broader issue is the attitude of academic staff in universities towards change in the education sector, which needs to be assessed and evaluated in order to reach a concrete conclusion and offer recommendations for solving the stated problem. It is also crucial to assess the social and cultural aspects of Libya in this study, because this will help in addressing the issue by exhibiting the mind-set of the Libyan people. The research will focus specifically on Libyan universities and colleges, so that the findings and implications that arise can be realistic and relevant for the education system in Libya.

1.1 Aim of the Study

This study aims to investigate the attitudes of lecturers and students from two departments - DEL and DEE at Al-Zawiya University in Libya towards the use of Internet technology for academic purposes, and to formulate a set of recommendations for upgrading the quality and

effectiveness of ICT implementation within the School of Engineering at the university (Because this school the sample study of this research). A novel framework for ICT implementation is developed with the aim of improving the Internet skills usage of lecturers and students, increasing the impact of the Internet on their academic efficiency, solving the problems they face while using the Internet, and increasing their satisfaction with the Internet facilities provided by Al-Zawiya University.

1.2 Objectives

The following set of objectives will support the achievement of the aims identified above:

- Examine the ICT gap in the Libyan educational system and the factors which influence the adoption and use of the Internet by LHEIs.
- Investigate the students' attitude towards Internet usage for academic purposes by using SPSS for the quantitative analysis of their answers to questionnaires.
- Determine the academics' attitude towards Internet usage for communicating with students, reviewing literature and teaching preparation from the qualitative analysis of their answers to semi-structured interviews.
- Use action research approach to formulate a novel framework for increasing the effectiveness of ICT implementation in School of Engineering at AZU.
- Formulate a set of recommendations for successful ICT implementation within the School of Engineering at AZU.

1.3 Research Hypotheses

The research proposes the following hypotheses:

HA: The present functioning of the educational system and structure in Libya is adequate to satisfy current educational demands to keep pace with rapid developments in the technological sphere.

HA0: The present functioning of the educational system and structure in Libya is inadequate to satisfy current educational demands to keep pace with rapid developments in the technological sphere.

HB: The attitudes of academic individuals and Libyan students towards ICT are positive.

HB0: The attitudes of academic individuals and Libyan students towards ICT are not positive.

1.4 Reasons for Conducting this Study

The following points reflect the reasons and motivation behind undertaking this research study:

- There is not enough literature available on the Libyan education sector, or on the inclusion of information technology to increase its effectiveness and quality.

- The perceptions and attitudes held by Libyan teachers and students towards using ICT have not been extensively extracted or analysed by researchers in recent times.

- The historical and social context of Libya in relation to the education sector has not been comprehensively explored by researchers in a way that presents ground-breaking or significant findings.

- The factors of globalisation and information technology advancements have changed the course of educational activities around the world, and are offering significant benefits to developing countries; this provides a good reason for undertaking a study of Libya, as a developing country, in relation to these new dimensions.

- It will be interesting to identify and explore the attitudes of Libyan academic staff towards technology adoption and change, and to observe the extent to which these attitudes are due to their cultural, social and historical background. This will provide a new addition to the literature available on different countries in this regard.

- It will also be interesting to explore how Western techniques, attitudes and change processes can be adopted, developed and applied to the Libyan cultural and social context.

- It is important to consider how the quality of the Libyan educational system can be improved by the inclusion of Internet and ICT, given the system and design of the sector in this country.

- The government in Libya has always encouraged such programmes and researchers can be helpful to them in devising and implementing strategies for further development and effectiveness, since progress in the fields of education and information technology will help the country overall.

1.5 Organisation of the Thesis

The work presented in this thesis is organized into eight chapters (five chapters provide the necessary background material while the other three present the original work) as follows:

Chapter 1 - describes the aims and objectives of this project, research questions and hypotheses, and the motivation for conducting this study.

Chapter 2 - presents an analysis of the historical development and current status of the education system in Libya, and the effects of economic, political and social factors on ICT implementation in the education system at macro and micro levels. Also contains the conclusions of the critical analysis of existing publications about factors influencing Internet usage in Libyan Higher Education, as well as a consideration of existing models (ASSURE, ASCD, I-CUBE, etc.) which can help lecturers to design and develop efficient learning environments for students and improve teaching and learning processes.

Chapter 3 - describes the style and implementation of the research methodology, and the design and development of questionnaires and interviews utilised to determine the approach of HE stakeholders to Internet use for academic purposes. Their answers are analysed by quantitative and qualitative methods and ethical considerations are taken into account.

Chapter 4 - presents the results of quantitative analysis (using SPSS package) of the students' answers to the questionnaire and qualitative analysis of the responses of academics from two departments to telephone interviews. Also, the links between the aims of the study, research hypotheses and these answers are analysed.

Chapter 5 - describes the design and development of a novel framework for increasing the effectiveness of ICT usage in teaching, learning and research activities in AZU. The framework is based on the action research approach. The chapter also contains an analysis of current issues related to ICT usage, and suggestions for the improvement of Internet skills and academic efficiency through the implementation of technology-enhanced learning activities.

Chapter 6 - presents recommendations for ICT implementation within the School of Engineering at AZU, aiming to improve support for learning and teaching activities, research and enterprise activities and student experience.

Chapter 7 - contains the conclusions of the research project, explains its contribution to knowledge and offers suggestions for further work.

The next chapter will present the past and current status of the education system in Libya, with a focus on the economic, social and political aspects influencing the adoption of ICT by educational bodies.

Chapter 2: The Background studies and the literature review of research

This chapter will describe the education system and present the background, tradition and current status of the education system in Libya as a general representation that comprises population, religion, geography and economy. The chapter will provide a strong basis and grounding for researchers and readers who are interested in studying and adequately understanding the context and background of research related to Libyan education. The nature of civilization in Libya comprises a number of elements which have various implications. Later in the chapter, utilisation of the Internet inside Libya is also discussed, and hence the background describes the underlying principles and problems of Libyan policy with regard to technological learning processes in Libya. The main focus is on the effects of economic developments and information systems on information technology outcomes in Libya. This will enable a better understanding of the links between complex modifications on both macro level and micro levels which are affected by public administration of educational bodies.

This chapter aims to explore some previously conducted studies related to Internet use generally, with particular attention to any work conducted in the Arab world, because that is a similar context to Libya. The Internet has become one of the most important human inventions in the last few years. Its rise to significance derives from its popularity, ease of use, flexibility, the richness of it as an information source and its availability to everyone without regard to place or time. Academic staff members, as professionals, need to keep updating their knowledge by following the latest technological inventions and adopting them for the academic environment. They are using the Internet for diverse purposes, such as keeping up to date, conducting research, and teaching and learning. As a consequence, many research projects have been carried out in the field to examine its impact on academics. This section of the study will review the nature of Internet usage by academics for academic purposes. It will be divided into three sections. The first part explores the nature of Internet use in higher education institutions and defines the main methodologies typically adopted for examining the topic. The second part explores the nature of Internet use by academics in the Arab region. The final part investigates the effect of various factors on use of the Internet by academics generally.

2.1 History of Libya

Libya is a very old country; its inhabitants are a traditional and established community of people that share an ancient and long history (AFDB, 2012). However, it is also a young, independent state that came into being under the support of the United Nations. For more than 1000 years, the Semitic people had influenced the sea trade and business of the eastern Mediterranean (Crook, 2009); later, Libya needed to rebuild itself in order to overcome its colonial legacy (Joffe, 1989) through continuing hard work.

In terms of more recent Libyan history, interactions among Western countries, in particular the USA and the UK, caused Libya a number of problems (Crook, 2009). US sanctions, and particularly strict global sanctions, placed Libya under considerable pressure (Kenan et al., 2011). Libya has also undergone social changes due to various factors, particularly those related to the training requirements of the labour force and arrangements for future growth and development (Elzawi & Underwood, 2010). As a consequence of this background, the Libyan financial system has been badly overstretched. For example, through the sanctions phase, Libya lost US$33.6 billion (Adams & Winthrope, 2011).

2.1.1 Populations and Economy of Libya

The economic and financial position of any country depends on its human resources and management (Elabbar, 2016). However, there is no stability in either the economic position or the potential of human resources in Libya.

Libya is an Arab Islamic country situated in North Africa, the majority of its limited population lives along its long border with the Mediterranean Sea. In terms of neighbouring countries, it borders Algeria and Tunisia to the west, Chad and Niger to the south and Egypt to the east (Elzawi, 2008). Although the expansion rate of the population has considerably improved from its previous 2.3% annually (CIA, 2010), the human resources position overall is very weak. On the other hand, the economic and financial conditions are strong because of the high revenues generated from oil and gas. The population of Libya in 1951 was approximately one million, this figure being dispersed as follows: 750,000 in Tripolitania, 300,000 in Cyrenaica and 60,000 in Fezzan (Porter & Yegin, 2006). In 2006, however, the reported Libyan population was 5,298,152 according to the results of the general census (World Bank Report, 2006).

At the end of 2008, the Libyan population was predicted to go beyond 6,461,454 people, this figure including 166,510 non-nationals according to the assessment of Elzawi (2008) and CIA (2010). The current population of Libya is 6,406,839 (Worledmeter, 2017) based on the latest United Nations estimates. Libya population is equivalent to 0.08% of the total world population; the ranks number 109 in the list of countries (and dependencies) by population.

The population density in Libya is 4 per Km2 (9 people per mi2); the total land area is 1,759,540 Km2 (679,362 sq. miles) and about 80.3 % of the population is urban (5,119,943 people in 2017) see below:
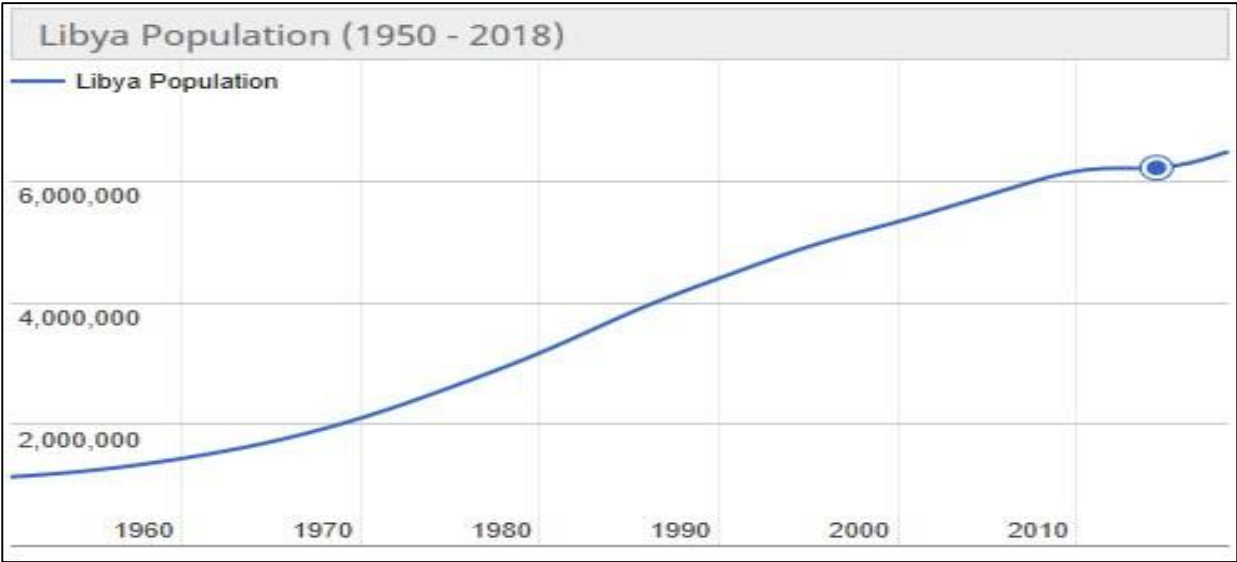
Figure 2.1: Libyan Population (Worledmeter, 2017)

The Libyan economy, according to World Factbook (CIA, 2010), depends primarily upon oil revenues, which contribute practically all the export earnings and almost one-quarter of Gross Domestic Product (GDP). A small population, combined with these oil revenues, gives Libya the advantage of the highest per capita GDP in Africa. Although there is strong evidence that Libya had made a great deal of progress on economic reforms as part of a vast campaign to reintegrate the state into the international fold, the government of Libya more recently announced a new strategy to create a free economy and took important steps toward privatisation (World Bank Report, 2006). The General People's Congress (GPC) of Libya also decided to completely open its doors to local and foreign investment and to free such investors from taxes, as well as providing more facilities and opportunities to industries such as tourism, agriculture and fishing with the aim of diversifying the economy away from oil (Elzawi & Wade, 2012). Libya's GDP growth rate achieved 6.1 percent and 5.8 percent in 2006 and 2007 respectively, despite the world economic crisis (ESCWA, 2010).

2.1.2 Libyan Education System

Most governments of the Arab states know that their school and university systems were, and still are, performing poorly (Volkmann, 2015). Arab governments, including Libya's, have been striving to improve their educational infrastructure and services, as described by The Economist (2009). The Ministry of Higher Education was established in 1981 to manage and control the universities in Libya (Treki, 2009). At present, the main issue is the standard of education; the requirement to educate so many in a small period of time creates the absolute

problem of quality of education versus quantity of education. This dilemma is a problem common in many developing countries (The Economist, 2009).

The current conflict in Libya has also affected HEIs in general. For example, communications have been disrupted as Libya's fibre optic cabling has been damaged, making distance learning schemes problematic. Lecturers and students have often had to rely on mobile phones and, where possible, apps such as Viber and WhatsApp (Volkmann, 2015).

In 1996, students were estimated to compose 27 percent of the Libyan population. The number of university students was 13,418,000, an extensive number of those being migrant learners who came to Libya with their families, or as workers, and then joined educational institutions. At present, the numbers of students in primary and secondary education are quickly increasing, driving the number of university students to surpass 200,000, in addition to almost 70,000 in the vocational and technical sectors (El-Sawaf, 2007). In 1980 an approach to equalise the balance, called the New Educational Structure, was implemented. The school curriculum was reformed to introduce and highlight technical subjects in addition to Arabic language, the study of the Quran and humanities. At secondary education level, the intervention strategy emphasised the opening of technical and vocational schools beside the traditional academic schools. This plan also highlighted the introduction of vocational and technical institutions in different areas of the country, which has contributed greatly to the development of these areas (Porter & Yegin, 2006; El-Hawat, 2003).

In 2006 the educational system in Libya had a six-three-three year pattern (see Figure 2.2) for primary, technical and pre-university education (i.e. the primary stage started at age six and continued for six years, followed by three years of intermediate school and three years in secondary school). The system has changed in 2010 and comprises two years of nursery, nine of basic education and three or four years of secondary education (Clark, 2010). The LHEI system is offered in both public and private universities, as well as higher institutes. Since 2000, the people's committees have been responsible for the management of education in the regions of Libya, although the overall management of state educational policies is the responsibility of the General People's Committee (El-Hawat, 2003).

In educational terms, Libya has changed quite dramatically in the past 50 years or so. Attitudes arising from school education, and attitudes towards education, are typical of such a situation and therefore do not show the kinds of patterns sometimes seen in the developed world. At primary and secondary level compulsory education started in 1975. The government took responsibility for the curriculum as well as teacher training (European Commission, 2010). There are four aspects which have had a major impact on the development of attitudes in Libyan schools, and these aspects will be discussed briefly.
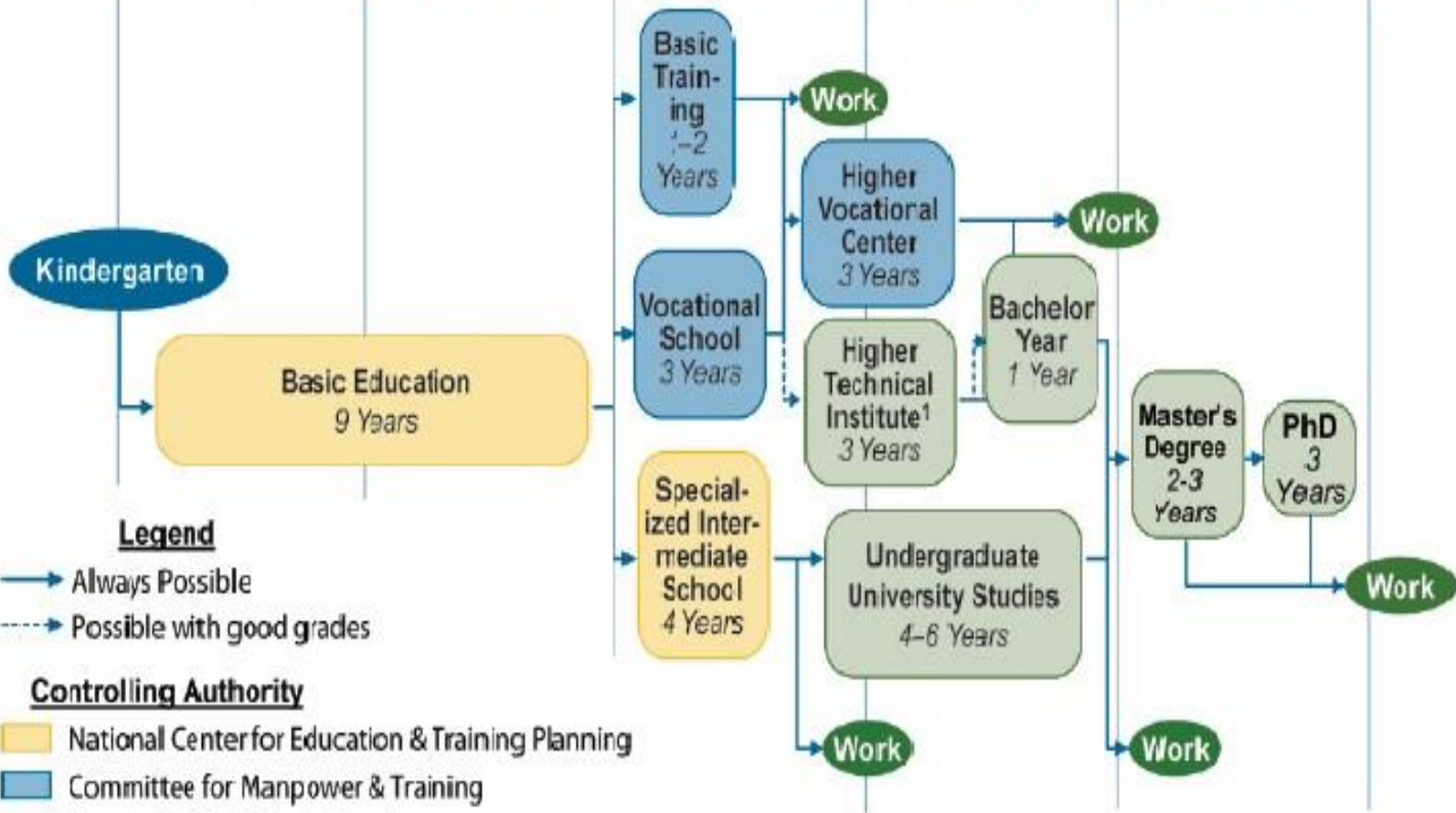
Figure 2.2: The educational system in Libya. Source: Porter and Yegin (2006)

2.2 Educational principles and structure

In their educational provision developing countries differ from developed countries. In Libya, the conditions in schools are those of a developing country. There are problems with the quality of education. Attempting to overcome these problems in a short time brings its own problems. Nevertheless, the Libyan government supports and provides finance to the education system.

On the country's independence in 1951, a UNESCO commission made recommendations about education in Libya. At that time there were only 29 primary schools in Tripoli and only one in Alzawiya. At that time there was only one teacher-training centre for women in Tripoli (UNESCO, 2011).

Table 2.1 below reflects the growth in the education sector in Libya over the past five decades, along with the literacy rate among males and females (Alhmali, 2007). The table shows a consistent increase in the literacy rate, which is a positive sign in this regard and indicates that the education sector in Libya has the potential to be improved and upgraded by using ICT.

Table 2.1: Growth in the education sector. Source: Alhmali (2007)

Growth in Education in Libya		
years	**Number**	**Literacy**
1951	**34000**	**Population literacy < 20%**
1962	**150000**	**Famale litercy ~ 6%**
1969	**360000**	
1977	**980000**	**Overall litercy 51% but famales 31%**
1986	**1245000**	**Litercy 54% male & 46% female**
2004	**1477000**	**Lietcy 28% male & 72% famale**

With regard to the structure of Libyan education, Table 2.2 below shows that in Libya, while formal education is organised from age four, general education spans thirteen years, with students entering primary school at the age of six.

Table 2.2: Libyan formal education. Source: Alhmali (2007)

Stage	Year Group	Ages	Period

Primary	**1-6**	**6-12**	**6 years**
Middle	**7-9**	**12-15**	**3 years**
High	**10-13**	**15-19**	**4 years**

Further details on the education structure in Libya can be observed from Table 2.3 below and Figures 2.1 and 2.2.

Table 2.3: Libyan education stages. Source: GPCE (2008)

Education Stage		Schools	Classrooms	Students	Teachers
First	Basic Education	3397	40743	939799	119313
Second	Secondry Education	1033	10940	226000	39847
Third	Joint	72	1228	30697	3764
		4502	52911	1196496	162924
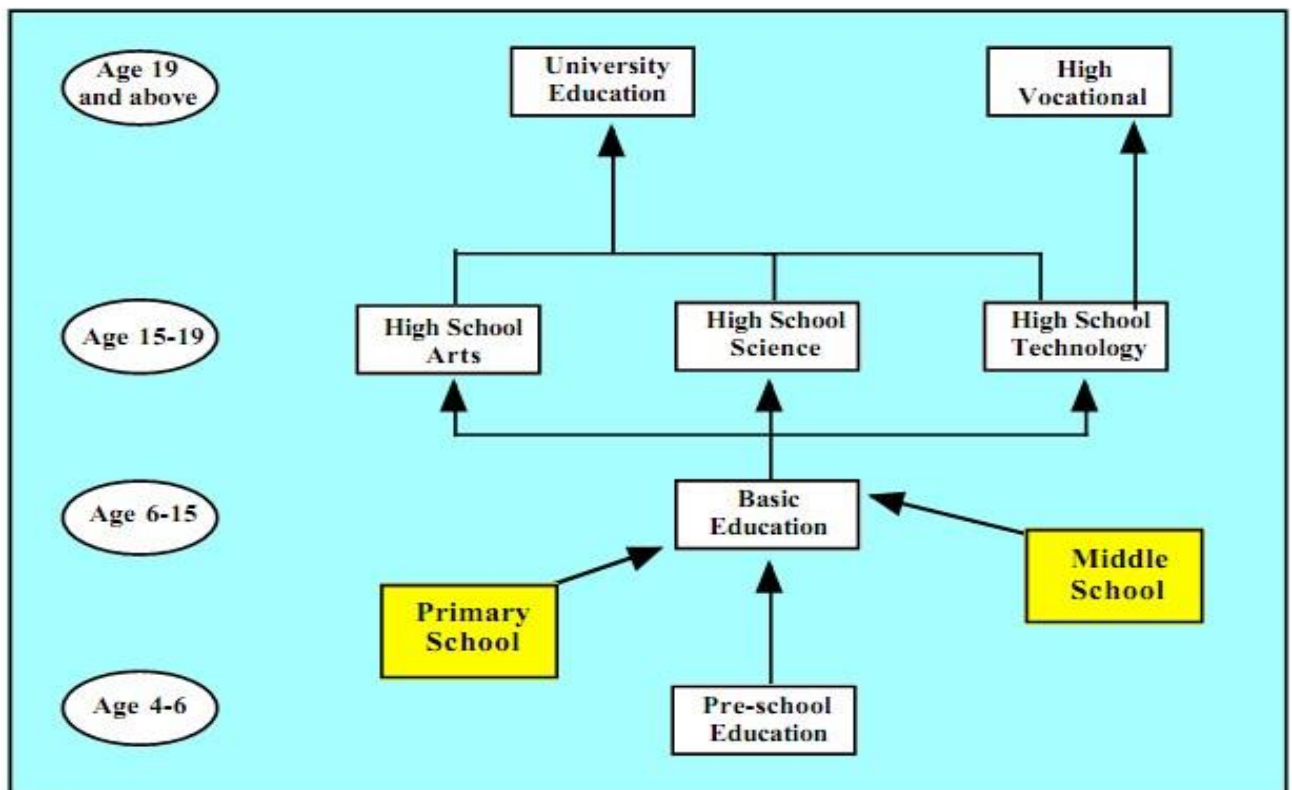
Figure 2.2: Educational stages. Source: Alhmali (2007)

The vast majority of children in Libya (99 percent) attend state schools for the compulsory education stages, including primary and middle school; at present, the stages extend to the end of high school. At the end of each year there are examinations, and students who pass may proceed to the next year of study. Performance in high school examinations determines entry to university or college (Alhmali, 2007).

The government provides policy statements detailing the aims of the schools in Libya. In a school designed to promote the cultural, moral, intellectual and physical development of students, the curriculum must cover all activities and prepare them for the responsibilities, opportunities and experiences of life and society (Rees & Althakri, 2008).

2.2.1 The school principal

The duty of the principal is to encourage others and to manage the school. It has been suggested that the Ministry of Education view principals as 'servants of innovation', and not (as they would prefer to be seen) as professionals empowered to take decisions themselves (Almansory, 1995).

The development of learning and teaching through in-service education demands changes in teaching practice. Othman (2010), argues that teachers in England have seen their role reduced to a list of 'competencies and performance'. This may be the same in Libya. Generally, teachers do not influence curriculum change this is a responsibility of government.

2.2.2 Compulsory education

The early stages of education typically last nine years usually from six to fifteen years old, with two levels: primary and middle. Primary school begins at six years and lasts until twelve then children move to middle level for three years of further compulsory study (Hamdy, 2007). At this stage children sit the national examination if they succeed they then move to the high school.

2.2.3 Higher education

In 1955, the formation of the first Libyan university was the most important success of an early period of independence. For synchronization and supervision between higher education institutions, three bodies are answerable inside the MHE&SR:

(1) The National Foundation for Technical & Vocational Education,

(2) Administration for universities, and

(3) Administration for private education (Kenan, et al., 2013c).

Furthermore, the National Centre for Quality Assurance and Accreditation of Educational and Training Institutes (QAAETIs) is in charge of the accreditation, recognition and equivalence of diplomas, and the quality assurance of public and private higher education institutions. At the start of the year 2012, with a sum total of 160 faculties, the higher education level consisted of twelve universities (two of them of a special nature), as well as five private universities, 16 technical faculties and 81 higher technical and vocational centres (Khalid, 2013).

2.2.4 Social Change in Libya

Libya moved into the new century with a desire to become part of the international community and with tremendous ambitions to take significant steps towards the peace process worldwide. Nevertheless, there is little doubt that the previous difficult period has left a negative image of the country, particularly in the West (Kenan, et al., 2013c). Improving Libya's image is not an easy mission, and it will take years of real effort if Libya seriously wishes to become competitive in technological learning processes. This will need to include development and growth of the infrastructure for Information and Communication Technologies (ICTs). Social change has emphasised the educational process and its concepts of making comparisons between data, acquiring information, facilitating feedback sessions, the characteristics of good information and considering different methods of information processing.

A. Growth of education

The significant objectives of the Libyan educational structure are to contribute to the social, cultural and economic development of Libyan society. The Libyan government recognised that growth requires a knowledgeable people, and that this could only be achieved by improving the abilities and capacities of Libyans, and by quickly raising the standards for human expansion in the society (UNCE, 2004). These goals were presented on September 2004 to the UNESCO International Conference on Education, and the following section will evaluate how well Libya is executing them. Over the past thirty years, regardless of a lot of progress and excellent fundamental results, the Libyan education system has so far not been able to accomplish the goals they have set themselves, including providing the training and skills necessary to advance the economy (UNESCO, 2005b).

A number of structural challenges and poor quality features are currently harming the education system (MENA Programme, 2012). In order to accomplish their greatest potential, the following matters should be addressed in order to benefit the Libyan people and economy (since education is a very important driver of competitiveness and therefore of wealth as well).

The General People's Committee for Manpower and Training, the Secretariat for Higher Education and the National Centre for Education and Training Planning currently share responsibility for the various stages within the educational structure. In addition, one of the most significant ministries in the country is the Ministry of Education. More than 5831 elementary schools, 3008 intermediate schools and 1466 secondary schools for boys (AFDB, 2012) are controlled by them. In 1970 there were just 15 elementary schools in Libya for girls' education, though by 1999 this figure had risen to 2460. There are also a substantial number of technical secondary schools, commercial secondary schools and industrial secondary schools.

Simultaneously, there are 35 advanced institutes in the situation, for example telecommunications institutes and technical institutes (AFDB, 2012). It has been revealed by the experience of other countries that success in educational improvement is important and is derived from both a central authority and continuity of institutions. In order for the educational improvement process to move forward, these two key areas must be clarified (Corrales, 1999).

B. Growth in communications and technology

Libya should also work harder to adopt the international standards recommended by the World Trade Organization (WTO), in order to be able to receive favourable treatment within the framework of international cooperation regarding the transfer of advanced technologies. Such a programme will allow Libyan nationals to develop their skills and expertise in all ITC disciplines (Hamdy, 2007).

Within the same context, Libya should seriously explore all possible schemes to invest in ITCrelated education. PCs and IT-related technologies should be made available in all Libyan secondary schools and institutes.

The UK and Libya have planned to work together to develop a modern and reliable communications infrastructure in Libya by utilising the extensive knowledge of the UK government in the following areas:

1- Information and Communications Technology (ICT) strategy;

2- Establishing a regulatory framework;

3- Physical ICT infrastructure;

4- Value-added ICT applications, including open government, e-government, e-commerce and e-learning (Anderson & Gronlund, 2009).

With a desire to cooperate in support of the E-Libya initiative's goals of improving quality of life in Libya through technology, and of catalysing the development of a Libyan knowledge economy, the implementation of the E-Libya initiative was intended to foster joint activities of technical cooperation (Anderson & Gronlund, 2009) with a view to:

A.   identifying opportunities on mutually-decided terms of enhanced investment opportunities in the country, responsive government activities, and increased access to technology; and

B.   strengthening the infrastructure and technological innovation systems of Libya by means of coordinated use of personal, technological and human resources.

2.2.5 The Need for New Technology in Libya

Regarding the characteristics of education and access to qualified teachers, a lot of the challenges faced by the Libyan educational system have been linked to the demands of technology development. With a small, uneducated population and almost no schools, Libya was one of the poorest countries in the world (AFDB, 2012), but oil revenues have endorsed the fast growth of education since 1963, after which it rapidly became both free and compulsory for all Libyans. Consequently, by 2003, the percentage of literate people had improved from 20% in 1951 to 82% (92% of males and 72% of females) (MENA Programme, 2012). In Libyan civilization these surprising changes have come about with such momentum and speedy rate of growth that there will inevitably be complications and challenges. As the report of the General People's Committee (2008) notes, there are many challenges that the Libyan educational system is facing, and these are linked to the authorisation required to meet the demands for qualified teachers and quality of education in the rapidly developing system. This general picture of Libya's educational background has been provided to enable an understanding of the features that control learning and coaching procedures in higher education in Libya, all of which are relevant to this research.

In order to find a methodology that is modern and more comprehensive than the existing system, there is an evident need to review the current curriculum in Libya. This inevitably demands the input of modern approaches and an undertaking to engage with the variables of the modern world. It is essential that Libya embraces the aspect of IT and ICT at this stage, as this will help to improve the overall system of education in the country (Kenan et al., 2012).

Becker and Riel (1999) also maintain that colleges and universities that provide teachers with computers for classroom use in USA have more chance of producing positive attitudes towards the execution of instructional technology. If the effective use of technology in the curriculum

and teaching activities is desired, then the positive attitude of teachers towards computing is critical (Becker & Riel, 1999).

Teo (2008) has shown that the perceptions and attitudes of teachers towards ICT usage in Singapore influence their wiligness for properly integrating technology within their teaching, research activities and course designs.

Furthermore, Emhamed and Krishnan (2011) conducted a study about the attitude of Libyan academic staff towards the use of ICT. Their findings suggest that teachers demonstrated a positive attitude towards integrating technology into teaching activities. CDs were found to be the most common type of technology being used because they were easily available. However, in most cases, overhead projectors were not available in classrooms, so they were rarely used for teaching purposes. Also, it was underlined the need for providing ICT training courses for teachers because they are stronger and more confident with digital skills in the areas where they practise regularly using ICT to support delivery of learning programmes, engaging learners, creating effective learning materials, enable collaborative learning, save time and reduce workload.

2.2.6 The Barriers of the Libyan Educational System

It is important to have a brief look at some of the issues being faced by the educational system in Libya so that recommendations can be made precisely within the context and data collection can be made accordingly.

The educational structure in Libya has been suffering from various problems despite major alterations in the curriculum, courses and student numbers. Al-senbul, a Libyan academic, has indicated a few of these problems, for example (GPCI, 2006):

1- The educational system in Libya is centralised.

2- There are problems in communicating between school and home because the intranet school system has high speed and enable users easy access while Internet access at home has slow speed with other considrations as the cost and the background & services of the ICT in general.

3- Within general education, the teachers are inadequately motivated.

4- Most secondary students study general education, while only a minority of them are trained in technical and vocational training high schools.

5- There is poor working liaison between development and education.

6- According to recent expenditure figures, the cost of a single student in Libya is 21789 dl, or about $16300. This figure is believed to be very high. The government is in charge of the expenses for all higher education students in the country (GPCI, 2006).

7- There are some small villages in Libya where the number of students is very low, sometimes just three or four. Consequently, the educational authority tends to teach students of various educational levels in the same class.

8- Since many of the rented school buildings intended for students are small, there is not sufficient space for libraries or science and computer labs.

The educational system in Libya is also encountering a very severe problem because of recent demographic changes. The main dilemma is the growing number of secondary school graduates who wish to continue with their higher education. Simultaneously, the universities and other institutions are facing huge challenges in admitting them (ILO, 2009).

Douglas, writing about the ICT gap in Libya in 2014, produced an article entitled "*Libya Leads the World in Slowest Internet Connection Speeds."* (Douglas, 2014). One challenge he describes is a lack of submarine cables, since there is no overarching strategy to have a fibre network throughout Africa. It is more a regional or country-by-country issue and has been a relatively slow process, despite the fact that the advantages would be immense in terms of better education, better health care and economic development.

Libya faces a number of challenges on the technological front. The country largely lacks the required technological infrastructure; however, many infrastructure projects are currently in progress. While computer laboratories are available in most Libyan higher institutions, the lack of adequate network facilities places serious restrictions on Internet access. The use of educational software within institutions is limited too, as there are very few products on the market that are available in Arabic, and the country lacks the capacity to develop its own products. Lastly, the technical support is almost unavailable in Libya, which leads to delays in installation, operation, and maintenance of equipment and software, and further discourages users (Rhema & Miliszewska, 2015).

A further contributory factor is raised by Elabbar (2016), who describes the effect of the civil war on higher education development in Libya. He depicts the political situation facing Libya from 2011 to 2016, and the major issues regarding the current conflict, the effects of which are summarised thus:

(1) Decreased knowledge and skill development within universities;

(2) Top-down approach from management or administration within universities and among

faculty staff;

(3) Poor facilities and resources, such as Internet, books, etc., and

(4) The effect of these factors on academic atmosphere, motivation and collaboration among teachers.

Finally, Savo Heleta (2014) mentions that the World Bank warns against prioritising basic education at the expense of higher education. It says this skewed focus creates deeply rooted imbalances and directly affects economic and social development in the longer term.

2.3 Nature of Internet Use in Higher Education

The Internet has a direct impact on all aspects of our daily life. A report by Internet World Stats showed that 9.1 % of Internet users are based in Africa and that the world's total Internet growth rate from 2000-2017 was 923.9% (Internet World Stats, 2017). Previous studies reveal that academics use the Internet on a daily basis for both personal and professional purposes. The frequency of their normal usage is measured at typically between one hour and four hours daily (Arab Social Media Report, 2014). The most used search engines are the generally most well-known ones, such as Yahoo and Google (Abodher, 2014; Hlgmhe, 2013; Arab Social Media Report, 2014). One of the main purposes of Internet use in higher education is for instructional activities. Academics use the Internet to make the teaching and learning process more exciting and interesting. They also use the Internet to renew their teaching material and to update their own knowledge (Kohn et al., 2010; GPCE, 2008). In addition, they use emails to communicate with their colleagues and students. The popularity of email services allows academics to keep in touch with their learners and to sort out any problems with the learning process (Teo, 2008). Another major purpose of Internet use by academics is for conducting research. Hlgmhe (2013) states that academics in scientific fields use the Internet more than hard copy materials. Furthermore, lecturers employ the Internet to locate needed information, to explore up-to-date knowledge, or to use available online services such as online dictionaries (Othman et al., 2013). Moreover, academics often use the Internet for data collection exercises, since they can reach large numbers of participants easily. The Internet can also be used for data analysis activities, as some analytic software tools are available online.

2.4 Studies Conducted in Libya Related to Internet Applications

This section mainly aims to give a brief indication of the nature of research carried out about Internet usage. Although Libyan cities have shared strong cultural, linguistic and educational traditions, reviewing the Arabic literature associated with Internet usage exposes a marked lack of previous research (Arab Social Media Report, 2014). Only a few studies have ever been conducted in Libya to investigate use of the Internet in general (El-Hawat, 2009).

The findings of such studies elsewhere are that the Internet is frequently used in teaching activities, and to obtain reading materials related to academic professions. They also show that gender has no direct relationship to Internet usage. However, there has been a distinct lack of in-depth studies of Internet use in the Arab world as a whole, let alone in Libya as such. Thus, the empirical starting point for this study is slight. Nevertheless, it might be that previous general studies have identified key factors that apply in most contexts. The last two decades have witnessed rapid developments in ICT which have played a significant and positive role in HE around the world, including in Arabic countries and Libya.

Libya, as is the case in many developing countries, has been stormed by the new wave of adopting ICT in education. This is considered a topmost priority for the Libyan government in order to improve the content of the Libyan Higher Education System (LHES). It has been important in developing interaction between lecturers and students in the University of Tripoli, who have attempted to adapt themselves to suit the current extent of ICT development and application. It is evident that overall development in the university education sector will not be possible without adopting the use of ICT tools which can improve the quality of teaching, learning and management in universities (Arab Social Media Report, 2014).

Thus, since 2005, Libyan universities have witnessed an extensive expansion in the range of ICT resources available for increasing the quality of teaching and learning (Abodher, 2014).

The University of Tripoli (a large university in the Libyan capital) now has plans to become a research-oriented university, because it has realised that this approach will contribute significantly more benefits to the country than being simply a teaching-oriented university. This raises the question of whether the implementation of such a 'research university' strategy will significantly impact on the influence of ICT usage (GPCE, 2008). The use of ICT has become increasingly common through the last few years with the existence of the Internet and the World Wide Web (WWW), and against this background, the Libyan government has signed an agreement with regard to the implementation of a national project for the use of ICT in the Libyan Higher Education (LHE) sector.

According to the World Bank Information for Development Programme report in 2005, the main aim of this agreement is to support LHE in establishing a national ICT capacity-building project in Libya. This includes the establishment and improvement of infrastructure for applications in all ICT areas. The agreement purposes to provide HEIs with computer

laboratories and classrooms for education and training, in addition to the creation of digital libraries and also the instituting of a local information network linking universities with each other. According to the Libyan General Authority for Information and Telecommunication (LGAIT), in 2007 it was estimated that this project would cost 72 million US dollars and take five years to be implemented. It would consist of 450 workshops and laboratories comprising more than 600 computers, as well as the creation of rooms for digital presentations in each university, all equipped with computers and display screens (LGAIT, 2007). the usage of ICT has greatly influenced LHE, and it is becoming progressively important, especially for the university education sector. It has a fundamental role to play in changing the LHE sector by enabling both students and faculty members to achieve successful teaching and learning outcomes, and will obviously change the way education is conducted. It has also become an area of growth across the university education sector and is at the very heart of the educational process (Abodher, 2014). It has generally been determined that ICT comprises computers and networks, hardware and software and other technologies as well as the equipment and services associated with these technologies (Elabbar, 2016). For the purpose and context of this thesis, however, the focus is on promoting the application of new ICT for learning and teaching in Al Zawiya University (AZU), Libya. A large number of research studies and reports have addressed the issue of ICT usage in education in general and in university education institutions in particular; the literature also discusses computer laboratories and Internet usage, as well as the benefits of and barriers to the use of ICT.

2.5 Factors Influencing Internet Use

In fact, many studies have been carried out to examine the influence of a range of factors on use of the Internet in educational institutions, such as Hamdy (2007), Kenan et al (2011), Rhema et al (2013) and Elzawi et al (2017).

Hamdy (2007) mentioned that factors are: Policy framework and implementation plan, advocacy and leadership, collaborating mechanism, human resources, urban/rural divide, gender equality, learning material, sustainability. Kenan et al (2011) examined the impact of E-learning and the ICT in universities from in Libya and UK and identified the barriers to ICT implementationas management, technological, cultural and other barriers. Rhema et al (2013) presented the findings of a case studies related to the students' and lecturers' experience of using ICT in two Libyan universities. The authors concluded that the success of

e-learning and ICT implementation are influenced by user perspectives, attitude, satisfaction with technology.

In conclusion the most generally noted factors shown to have a direct effect on use of the Internet and other types of technologies are age, gender, academic rank, control and experience in use of computers and the Internet. Elzawi et al (2017) mentioned that three further factors should also be considered. The first relates to the use of the term 'new methods'; researchers often use this to refer to new technologies such as the Internet, but this may be confused with other interpretations. The second factor is neglect of the terms of the new media in the literature of social and political science, where there is no developed framework for explaining and evaluating cultural transformations in developed countries. The third factor is related to specialist literature in the field of communications. In spite of the mass of researchers in the field, very few have been concerned with investigating the Internet as a cultural phenomenon.

Having introduced these factors, this study will now indicate relevant theoretical models which can be integrated with the factors affecting Internet usage in HEIs in general, and in LHEIs in particular, in order to determine a clear set of recommendations.

2.6 ASSURE Model for Instructional Planning

Heinich et al. (1999) offer the use of the ASSURE model for planning and delivering teaching sessions that integrate technology and media or other Internet applications to provide authentic assessment of student learning. 'ASSURE' is an acronym that stands for the various steps in the model, as shown in the figure below. It is an instructional design model that has the goal of producing more effective teaching and learning. The researcher of this thesis has chosen this model as a tool to investigate Internet application in the university and in higher education institutes in general.

The following is a breakdown of each step.
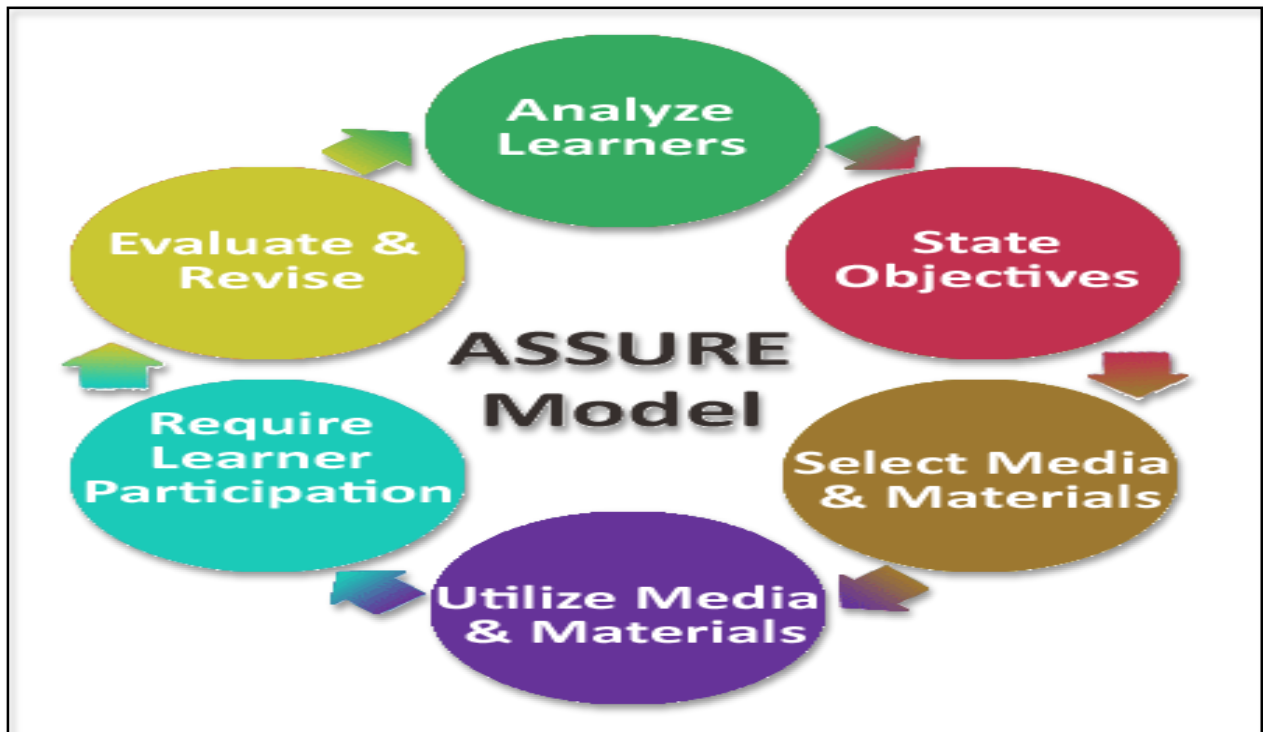
Figure 2.3: ASSURE model. Source: Heinich et al. (1999)

A – Analyse learners

The first step is that the lecturer should analyse the capabilities of the learners or students on the course. This stage should focus on their characteristics in relation to the learning outcomes required. The information gathered, together with the course curriculum, will guide the decisions the lecturer makes with respect to further steps in the development of the course. When the lecturer has determined the knowledge and character of the students, this will direct him/her in choosing specific strategies and resources to assist learning.

S – State standards and objectives

As shown in the model, after analysing the students' capabilities, the lecturer needs to state the principles and learning objectives for each section of the course. This declaration should consist of a specification of what the students will be able to achieve as a result of the instruction. The declaration should focus on what the students will know as a result of following the course. The objectives can also be used in assessing the success of the students, and possibly for grading. Furthermore, it will let them know what to expect during classes. A useful guide to formulating and determining appropriate learning objectives is contained the ASCD model (Andersson & Grönlund, 2009), as shown in section 3.5 below.

S – Select strategies, technology, media and materials

The second 's' in the acronym stands for selecting strategies, technology, media and materials (or usage of any Internet application). Once the learning objectives have been determined, the lecturer should consider what instructional strategies, technology, media or suitable applications will give the required results. Whatever delivery method is chosen, it should

include group discussion or cooperative group work, as learning becomes more exciting when there is more class participation (Rees, 2002). Although there will inevitably be a certain amount of crucial information and technique that the teacher must deliver and demonstrate (Othman et al., 2013), *"Learning is at its best when the lecturer merely leads the student into discovering the correct answer to a problem themselves. An effective teacher is merely a facilitator to the process of learning"* (Kohn et al., 2010).

U – Utilize media and materials

This important stage in the ASSURE process concerns the lecturer making a plan as to how he or she will utilise the technology, media and materials selected. As with all the instructional steps, the lecturer needs to ensure that the plans contribute towards producing the objectives; to achieve that, it is necessary and important to follow the '5Ps' process:

P1: Preview the technology, media and materials or any Internet application: lecturers should do this before teaching their lessons, to ensure everything goes smoothly and seamlessly.

P2: Prepare the technology, media and materials: lecturers should prepare their applications before the lesson time.

P3: Prepare the environment: the lecturers should arrive before the lesson time, because some minimal preparation will be required to set up the learning environment.

P4: Prepare the learners or students: lecturers should clearly inform their students what the learning objectives are. This will help them to create a conceptual map of what they need to understand, as well as how they will be graded if there are tests, etc. The lecturer should also explain the benefits of what they are learning.

P5: Provide the learning experience: lecturers should then be prepared to carry out the lesson after following every prior step of the process.

R – Require learner participation

This step essentially belongs within earlier steps. It requires that the lecturer makes plans regarding how he or she is going to actively engage the students in the material being taught. This needs to be determined at both class and individual level. The most basic step is to require student participation in class discussions. Therefore, the lecturers need to plan exactly how the students will learn the information, including the techniques to be adopted. This plan requires specific strategies (Khan et al., 1973).

E – Evaluate and revise

The final step in the ASSURE model process is just as fundamental as all the others. In this step, the lecturer must evaluate the impact of her/his teaching on students' learning. This

includes an evaluation of the teaching strategies and how the technology, media and materials, as well as any Internet application that has been used, have been applied. The final step should also focus on feedback from the students.

Othman et al (2014) used ASSURE model to design, develop and implement of an e-learning package which could be used by student to prepare themselves before attending the practical computer lab sessions so they will develop computer programs easily. In conclusion, the ASSURE process is a regimented guide to improving the lecturer's teaching technique, allowing them to update their methods and improve their teaching skills for many years to come.

2.7 Curriculum Design Model (ASCD, 2012)

There are many curriculum-design models, such as the Association for Supervision and Curriculum Development's (ASCD, 2012) approach to curriculum development, which offers a set of principles as a guide to course planning. The original framework was designed in 1990 by Gordon Cawelt, whose guide aimed to offer a balanced core of learning in each course, adopting 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. Course outcomes are designed by focusing on the required results, with multiple indicators (assessments) of performance that will encourage originality, insightfulness and problem-solving, along with mastering important information. Also, courses should be designed to encourage active involvement and student progress should be measured from early in the course, rather than studying all the principles and basics prior to performing.

However, with regard to assessments and feedback, interactive learning should be reasonable and non-threatening; feedback must be delivered to students regarding their performance at a sensible time by setting module assignments that need students to engage in analysis of the content (Hlgmhe, 2013). There are a number of assessment types, such as ongoing assessment throughout the course, which may contribute to the final grade; this will encourage students' motivation, as short-term goals can be achieved, and some students do not perform well in formal examinations. The choice of method of assessment will depend not only on the lecturer's thinking and preference, but also on whether the group of students is small or large. The range of possible methods includes short answers, essays, practical work, workshops, 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).
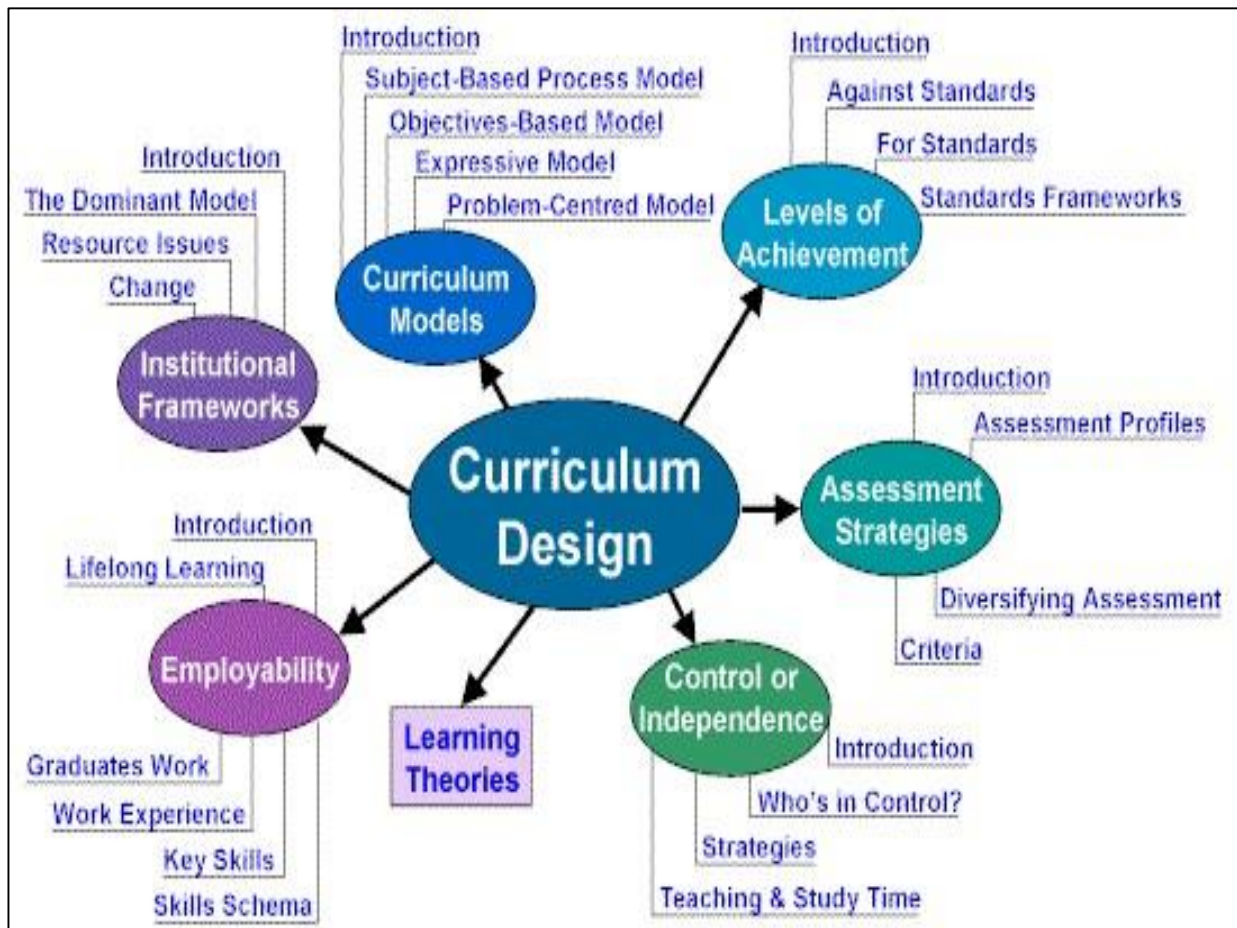
Figure 2.4: Curriculum design mo   del (ASCD, 2012)

2.8 I-Cube model

This model is so named because its shape is a cube and the names of all its edges start with the letter 'I' (Kenan, 2015). The model is modern and can be used for the development of teaching and learning activities in the twenty-first century; furthermore, its design is based on the Libyan context by considering the situation there (see Figures 2.5). The I-Cube model includes relationships between the three main groups of stakeholders in higher education institutes. The first relationship is between the teachers or lecturers and their students, the second is between lecturers and technicians, and the third is between students and technicians. This model indicates the development of teaching and learning activities and the elements that affect them, and was designed as part of a study on Libyan HEIs.

2.8.1 Relationship between lecturers and technicians

In 2015, Kenan concluded from analysis of many viewpoints and results that there were four factors, represented in terms of relationships, that would lead to success in the development

of e-learning in general. These four factors for consideration could be drawn as a square, as shown in the LT surface in the following figure.

The four edges of the LT surface represent information, the Internet, the intranet and individual skills. Each edge plays an important role in the success of e-learning performance as described (***Information, Internet, intranet and Individual skills).***

2.8.2 Relationship between lecturers and students

Various theories, models and frameworks have been presented regarding the relationship between teachers or lecturers and their students in the pedagogical history of HE. Kenan (2015) determines four factors represented in the relationship between lecturers and students which would lead to success in the development of e-learning in general. These four factors can again be drawn as a square or surface. The four elements are the ***intranet, infrastructure, interactive learning and initial skills.***

2.8.3 Relationship between technicians and students

This relationship is complementary to the two previous relationships, and its edges adjoin both the lecturers-students surface and the lecturers-technicians surface. The technicians-students relationship is again represented as a surface with four edges by Kenan (2015), who identifies four factors in the relationship that should lead to success in the development of elearning in general. The four edges in this square are ***information, implementation, periodic improvement and infrastructure.***
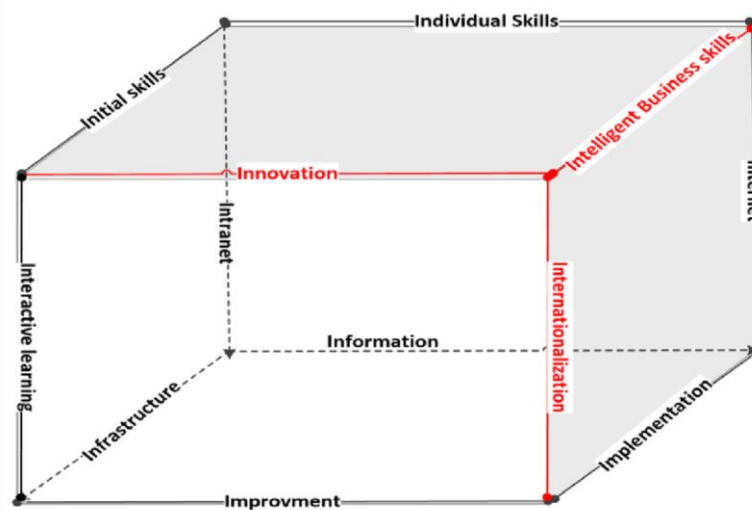
Figure 2.5: Final view of I-Cube (Kenan, 2015)

These other three edges are intelligent business skills, internationalisation and innovation. Figures 3.6 demonstrate the addition of three new surfaces and their relationships with the

new edges to make the I-Cube. The edges formed from the combination of all three surfaces are therefore information, the intranet, the Internet, individual skills, infrastructure, interactive learning, initial skills, periodic improvement and implementation.

Furthur more, many pedagogical theories are related to innovation and internationalisation, both of which have a great effect on the development of the teaching and learning process. To these, Kenan (2015) adds intelligent business skills, which are required to complete new strategies for HE systems. The three new surfaces depend on the new edges of innovation, intelligent business skills and internationalisation to make the I-Cube, as shown in the figure 2.5 This is gives initial explaination to how the I-Cube model used to development the teaching and the learning activities, Also there is onther present to suppot the ICT framwork in **chapter 5.**

2.9 The Internationalising Framework for HEIs

Internationalisation needs many basics to become functional. It requires a framework that will encourage and assist in the process of internationalising HE, thus producing 21st century graduates who will live in and contribute responsibly to a globally interconnected society (HEA, 2015). The British Council offers, through its international higher education courses, many opportunities for success, and various other attempts have also been made to allow courses to be as close to an average level as possible and to equalise the credit hours in HEIs (Bennett et al., 2008).

Such an internationalising framework should be driven by a vision to promote a high quality, equitable and global learning experience for all students studying HE programmes, regardless of their geographical location or background. It needs to be designed as an enhancement tool for HE, to complete the following objectives:

. To recognise and enhance the quality and variety of internationalisation policy and practice in HE;

2.   To foster collegial educational methods which transcend national and international boundaries;

3.   To acknowledge the current institutional and individual roles and responsibilities essential to understanding the internationalisation of HE.

Internationalisation also requires substantial vision with regard to interactive learning methods, first locally and then internationally. This vision should focus on curriculum design, assessment of achievements, support for learning and how the level of students will be measured (Bhalalusesa, et al., 2013). Other aspects for consideration include feedback, how student progress is supported, and annual evaluation for teachers and technicians.

Although there are many that recognise learning as socially situated, an internationalising framework should aspire to have regard for: -

1. HEIs becoming an international community;

2. The impact of cultural, individual and linguistic multiplicities in any given context;

3. The continual improvement of activities, knowledge and values necessary for internationalising HEIs;

4. The sharing of responsibility for internationalising HEIs between organisations, people and curricula;

5. Sharing of collaborative ways of working across the whole academic lifecycle;

6. Differences in interpretation and application that are relevant to diverse contexts.

Many of these factors are already evident in the change of academic communities and provisions on offer, as well as the content, mode, pace and place of learning. By recognising these changes, the Higher Education Academy (HEA), the leading national body for learning and teaching in the UK, has developed a 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 HEI systems throughout the world (HEA, 2015).

Figure 2.6: Internationalisation framework for HEIs within the UK (HEA, 2015)

Figure 2.6 shows the framework and how it can be applied. The framework is intended for a range of interested parties connected to 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 proposes 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 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 a 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 HEIs -** The collective level includes sector agencies, professionals, decision makers, statutory and regulatory bodies, unions, employers and others that influence HEI. The framework can enable 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, 2015).

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 impact of individuals in internationalising HE.

3.   **Curriculum -** This includes the content, design and delivery of learning and teaching materials; 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 former 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, people and the HE curriculum, as well as between and across activities, knowledge and values.

2.10 Technological and Pedagogical Model for ICT Integration

Many models for measuring ICT integration in teaching and learning have been proposed through the years, which proves the importance of improving the effectiveness of teaching and learning through use of Information and Communications Technologies (ICTs) in HEIs. Students can become more interactive with technologies such as netbooks, interactive whiteboards, smart phones and digital video recorders; also, these technologies have become more available and affordable, coupled with the rapid expansion of computer networking capability.

Mei-Chuen Lin et al. (2012) have designed a model for measuring individual teachers' progression in ICT integration and for guiding them toward higher integration levels (see Figure 2.7). This is a two-dimensional model to assess pedagogical competency and technological competency as follows:
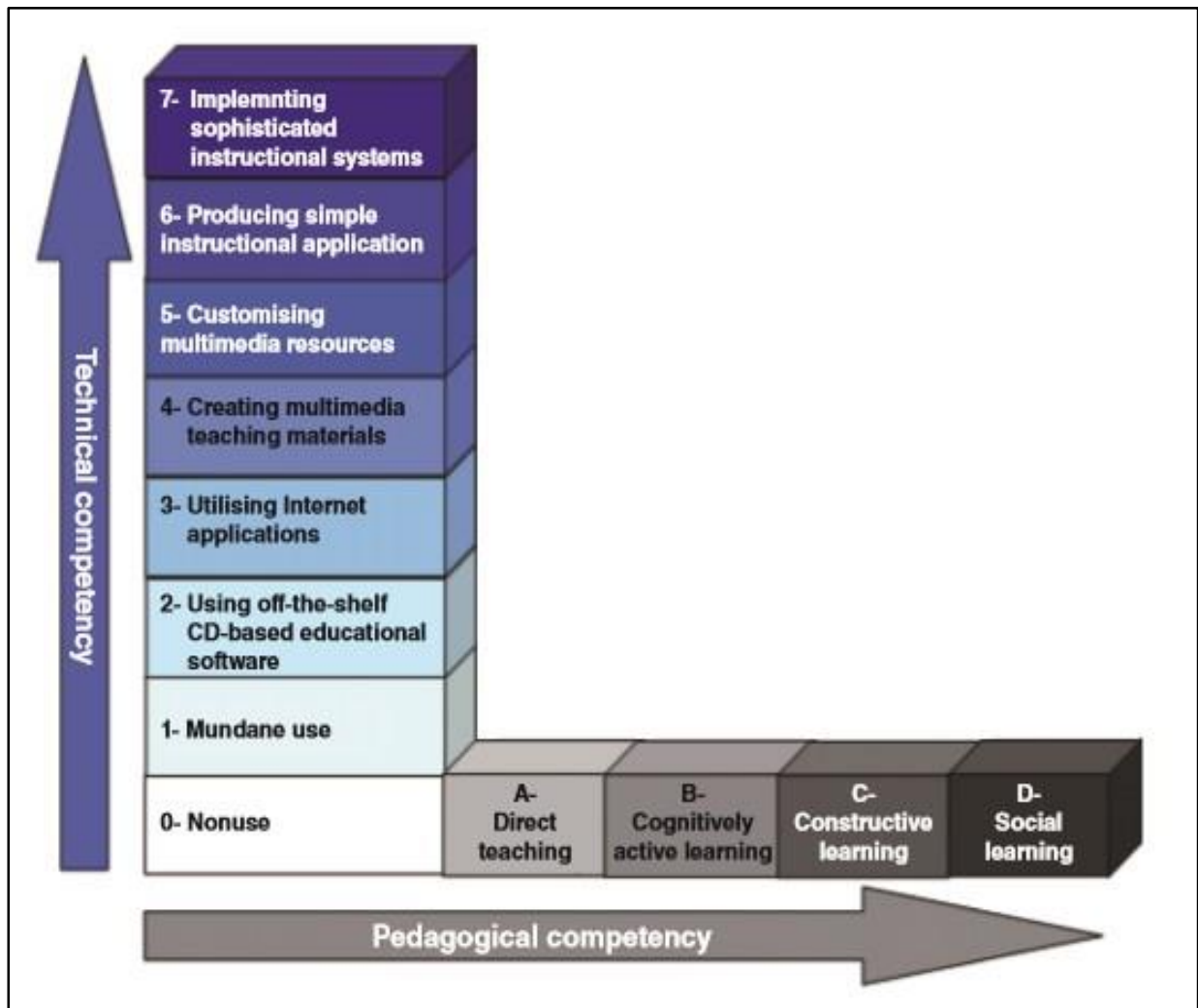
Figure 2.7: Two-dimensional model for measuring individual teachers' progression in ICT integration (Mei-Chuen Lin et al., 2012)

There are **four** levels in the "pedagogical competency dimension": direct teaching, cognitively active learning, constructive learning and social learning. These are based on four factors: pedagogical beliefs, instructional strategies employed, teacher-student engagement and the nature of tasks that students carry out.

The technology dimension contains **eight** levels, ranging from Level 0 (non-use) to Level 7 (implementing sophisticated instructional applications). The eight levels are defined based on three factors: whether a teacher is a passive consumer or an active producer of ICT-based resources, sophistication of the ICT tools that a teacher uses, and richness of functionality of an ICT-based product developed by a teacher. To validate the proposed model in terms of its applicability and practicability, three case studies were conducted. The results showed that this model was able to adapt to the individual preferences of three participating teachers, as well as guide their progression in ICT integration (Mei-Chuen Lin et al., 2012).

2.11 Summary of the Chapter

This chapter has presented a description of the education system and structure in Libya by highlighting the key points, including the need to introduce ICT into Libyan education and the perception of current academic staff regarding the issue in this research study.

The next chapter will present the review of publications about Internet use in HE (focusing on factors related to universities from Arab region) and models employed for teaching and learning purposes (such as ASSURE, ASCD, I-CUBE model, internationalisaing of HE).

However, this chapter has presented a review of the literature related to this study. It has referred to research regarding the nature of Internet use in higher education, including studies conducted in Libya and the Arab World. It has also considered factors influencing Internet use and presented the development of such usage within theories and models such as the ASSURE model for instructional planning and the ASCD model for curriculum design. It has explored the I-Cube model and the relationships between the main groups of stakeholders in higher education institutes, and given an overview of innovation and an internationalising framework.

The theories presented in this chapter will be used as references and models in future chapters; for example, the ASSURE model is used as a guide to the formulation of a new framework in **Chapter 5**. The ASCD model for curriculum design is used to design, develop and implement ICT courses, and the internationalisation framework is considered when building a new strategy.

Furthermore, the I-Cube model has been used to prepare the case studies included in the recommendations in **Chapter 6**, and is also used to evaluate the new ICT framework in **Chapter 7.**

The next chapter will explain the research methodology used to conduct this study and describe the approaches adopted.

Chapter 3: Research Methodology

Methodology reflects the activities that examine and rationalise the methods and techniques employed for the conduct of research. This chapter aims to explain and justify the techniques of accumulating information employed in this study. Research is defined by Yin (2003) as the compilation of information and facts by means of rational methods concerning an explicit

theme, while Study.com (2015) describes one of the characteristics of research methodology as the detailed description of use of selected study methods together with their advantages and issues. Research techniques must be suitable for the methodology of the research, and ought to be consistent in order to convince readers and consumers of the study of its strength. The methodology for this study covers not only the methods and their justification, but also the approaches employed. For this study, a blend of quantitative with qualitative approaches is adopted, as examination of quantitative data is combined with elucidation and discussion of qualitative interviews. Examination of the information accumulated, together with explanations regarding the topic of this research, is reviewed by assessing it against the available literature obtained through secondary data collection channels, particularly with regard to the historical and educational background of Libya.

The findings of this study are depicted in terms of information and data obtained via interview and questionnaire, the purpose of which was to explore and identify the attitudes of academic individuals or professionals working in Libyan universities, and students studying in universities, towards using ICT in educational activities. Thus, this methodology is devised to attain the following targets:

- Data gathering on the topic;
- Review of results against data obtained via secondary channels;
- To present rational interpretation; and
- Review of interpretation by participants involved in the study.

3.1 Research Design

A study design concentrates on explaining the research type and therefore works as a plan or arrangement for a piece of research. Effective study design is the skill of planning processes for carrying out research to obtain the most relevant results (Kothari, 2008). A research design is, in fact, a blueprint devised for the whole work, because it leads to the queries to be examined during the study process. In addition, it points out which study areas should be kept in focus during the research procedure.

Although it is important for a researcher to examine the area in which he is planning the research, Creswell (2013) states that very few researchers successfully show sufficient interest in study design, perhaps because they are unable to recognise design as their primary or key objective in devising a study proposal (Hossain, 2012). However, Hung et al. (2002) propose that identification of the study issues is the first step in research design, which is normally an exploratory phase. There are several types of research design available, such as descriptive, causal, exploratory, etc., but for this research, an exploratory design was

preferred. This is because in this kind of design, innovative elements are recognised with the principal aim of examining an issue from an operational standpoint by executing a specific examination. It is best matched to research in which the investigator seeks to achieve background data and extra developments regarding an existing issue, as it includes examining pertinent literature together with surveying participants having former experience of facing the issue under concern.

3.2 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 educational theory, and user of it. This is a technique appropriate to creating knowledge about learning and teaching in higher education, and is an influential technique for 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 together thus provides theory and practice in parallel (Pernecky, 1963). The Porter Group (2015) write that "s*ome researchers have seen action research coincidentally as an individual or collaborative project*".

There are numbers of references considered the action research method is real research method; because of the cycle of it make investigation for each stage and explain the reality of it to how dealing in next cycle.

"The notion of saturation does not refer to the point at which no new ideas emerge, but rather means that categories are fully accounted for, the variability between them are explained and the relationships between them are tested and validated and thus a theory can emerge" Cited in (O'Reilly and Parker 2013, p. 3)

There is recent project in Armenia at 2015, has evaluated by the Action research method, this study presents a project evaluation framework for capacity building ICT projects, and describes an action research initiative in which the framework was piloted. The framework is a Five stages process that draws on soft systems thinking and best practice in areas like ICTs for development and information systems evaluation.

Price (2011) emphasises that 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. Thus, 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 practitioners to design their activities based on their own knowledge and previous feedback (see Figure 3.1).

It is viewed as a spiralling or iterative process, with each cycle serving into the next. Beginning with the 'Plan-stage', the researcher determines 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 the 'Act-stage', the agreed steps are taken. The 'Collect-stage' is next, where the researcher collects data to determine whether change has occurred. At the 'Reflectstage', the researcher analyses the data, discusses the findings and determines the degree to which 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, 1980).

The action research was a collaborative undertaking between the author and an international non-governmental organization, and involved a project to develop information management solutions. (Lannon,2016). In this thesis the researcher focused on the two first stages which are the identfy the problem and divase a plan and then applied it in research
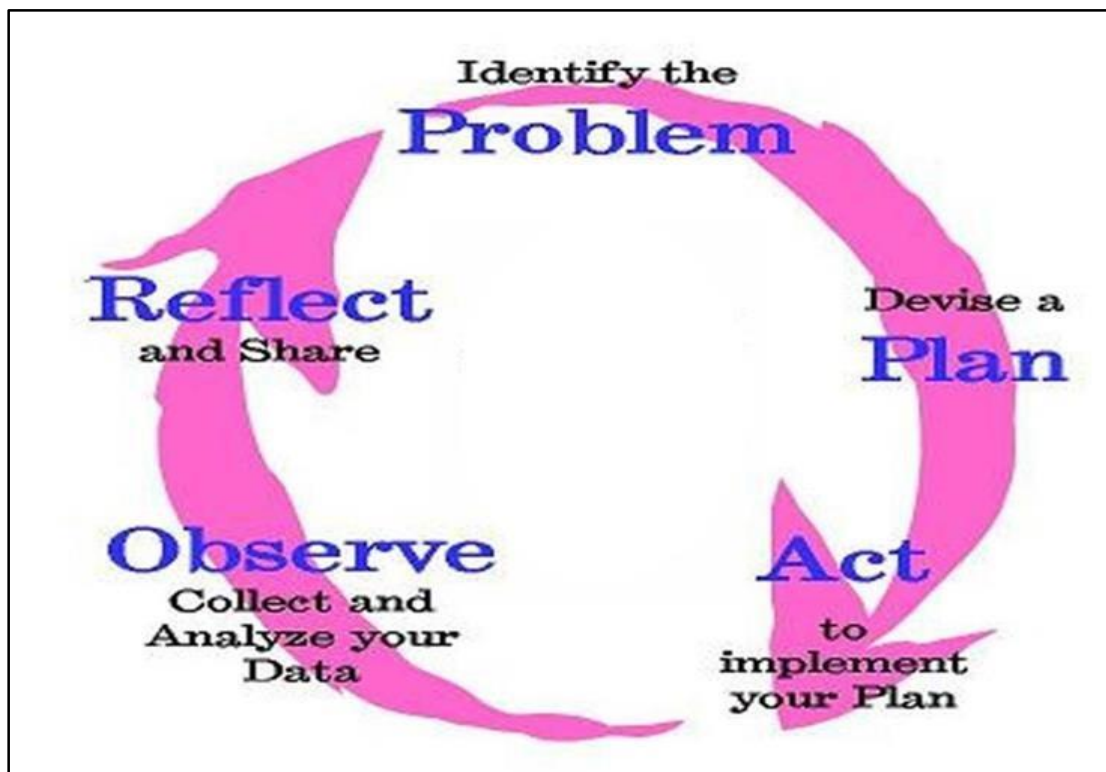
Notwithstanding progress in understanding the way in which people learn and the design of learning environments, teaching practice in HE frequently remains unaffected. Traditionally, lecturers have not been encouraged to expand upon theoretical developments as a means of improving curriculum design and delivery (Khan, 2001). In this study, however, action research has been used to develop a new ICT framework (see Chapter 6).

3.3 The quantitative and qualitative research approach

Characteristically, a quantitative approach is goal-based and constituted of numerical data, which is the reason why it is often deemed as scientific; in contrast, qualitative research is descriptive by nature, offering the study's findings and experiences in a narrative manner (Creswell, 2003). This research is conducted by adopting both approaches at the same time. Thus, the data obtained via questionnaire survey represents the quantitative feature, whilst the narrative from observation and interviews was obtained by making use of a qualitative approach. In this way, the exploratory and narrative features of both approaches were employed to answer the research questions. The employment of qualitative research was of great help, as it assisted the researcher in compiling more subjective data.

Data collected in a quantitative study are based on responses generated from surveys. The raw data then have to be coded afterwards. Contrary to this, in a qualitative study, narrative interpretations are made by studying the perceptions of research participants in detail. Creswell (2003) states that qualitative research is exploratory whereas quantitative research deals with explanatory inquiry. A researcher's personal knowledge is best utilised in a qualitative study, especially when subjective data is to be gathered (Pernecky, 1963). However, an attempt must be made to avoid the intermingling of the individual perspective of the researcher with the research results and findings.

Collis and Hussey (2003) have classified the different stages of research (see Table 3.1) into the following:

- Defining the purpose of the research (the reason for conducting the research);

- Determining the process of the research (the way in which data will be collected and analysed);

- Assessing the logic of the research (whether the researcher is moving from the general to the specific);

- The outcome of the research (whether the researcher is trying to solve a problem or make a more general contribution to knowledge).

Table 3.1: Strengths and weaknesses of positivist and phenomenological 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 3.1 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 3.2 presents the qualitative and quantitative aspects linked to questionnaire design (Oppenheim, 1992). Both quantitative and qualitative methods may be used for data analysis from questionnaires. These methods complement each other in terms of answering research questions and increasing research validity (Teddlie & Reynolds, 2000).

This combined approach can ensure triangulation. Both Blaiki (1991) and Adams (2006) confirmed that to achieve triangulation, it is essential to gather information qualitatively as well as quantitatively.

Table 3.2: 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 using conceptualisation	Data analysis is conducted through statistics and charts

A - Quantitative research methods

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

B - Qualitative research methods

These are based on methods of data generation which are flexible and sensitive to the social context in which the data are produced (Collis & Hussey, 2003). The nature of reality is defined by the interaction of the researcher with the phenomenon under study. Qualitative research usually emphasises words rather than quantification in the collection and analysis of data. Qualitative data can be analysed by browsing, highlighting, developing categories and reducing the information to a meaningful analysis (Creswell, 2005). In this research study, the responses to open-ended questions were coded and analysed manually. The data were reduced to themes and then interpreted. Also, qualitative analysis methods have been used to analyse answers to interviews provided by academic staff from two departments (DEL – Department of English Language and DEE – Department of Electronic Engineering).

Muijs (2011) discusses realism, subjectivism and 'paradigm wars' between quantitative and qualitative methods. Quantitative methods are based on numerical data which are statistically analysed so they are considered to be 'realistic' and 'positivist'. Qualitative methods look at non-numerical data, so they are considered to be 'subjectivist'.

3.4 Research Strategy

Saunders et al. (2009) observe that the creation of a research strategy is a fundamental step because it helps the researcher to answer specific research questions and hence, meet the study's objectives. They state that "the choice of research strategy will be guided by the

research questions and objectives, the extent of existing knowledge, the amount of time and other resources available, as well as the researcher's philosophical underpinnings" (Saunders et al., 2009:141). A research strategy can be described as the way a research question(s) will be answered in order to meet the research aim and objectives (Saunders et al., 2009). Yin (2009) states that several research strategies are used in the social sciences, such as experiments, surveys, histories, analysis of archival information and case studies. He notes that three factors should be considered in order to choose the appropriate research strategy, these being the type of research question posed, the extent of control the investigator has over actual behavioural events, and the degree of focus on contemporary as opposed to historical events. Table 3.3 indicates the various research strategies and characteristics as suggested by Sekaran (2007).

Table 3.3: Characteristics of research strategies. Source: Sekaran (2007:36)

Strategy	Form of research question	Requires control over behavioural events	Focuses on contemporary events
Experiment	**How, Why**	Yes	Yes
Survey	**Who, What, Where, How many, How much**	No	Yes
Archival	**Who, What, Where, How many, How much**	No	Yes/No
History	**How, Why**	No	No
Case Study	**How, Why**	No	Yes

Amongst these strategies, the case study is considered a particularly useful vehicle for qualitative research, and is defined by Sekaran (2007:37-38) as

"… an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident … the case study as a research strategy comprises an all-encompassing method; covering the logic of design, data collection techniques, and a specific approach to data analysis".

In this research, the researcher was seeking to understand the nature of adoption of the Internet at one university; this was considered to be a joint context rather than looking at individuals as separate cases. Figure 3.2 below compares the different methodologies typically used to investigate technology adoption issues at the organizational, individual and household levels.
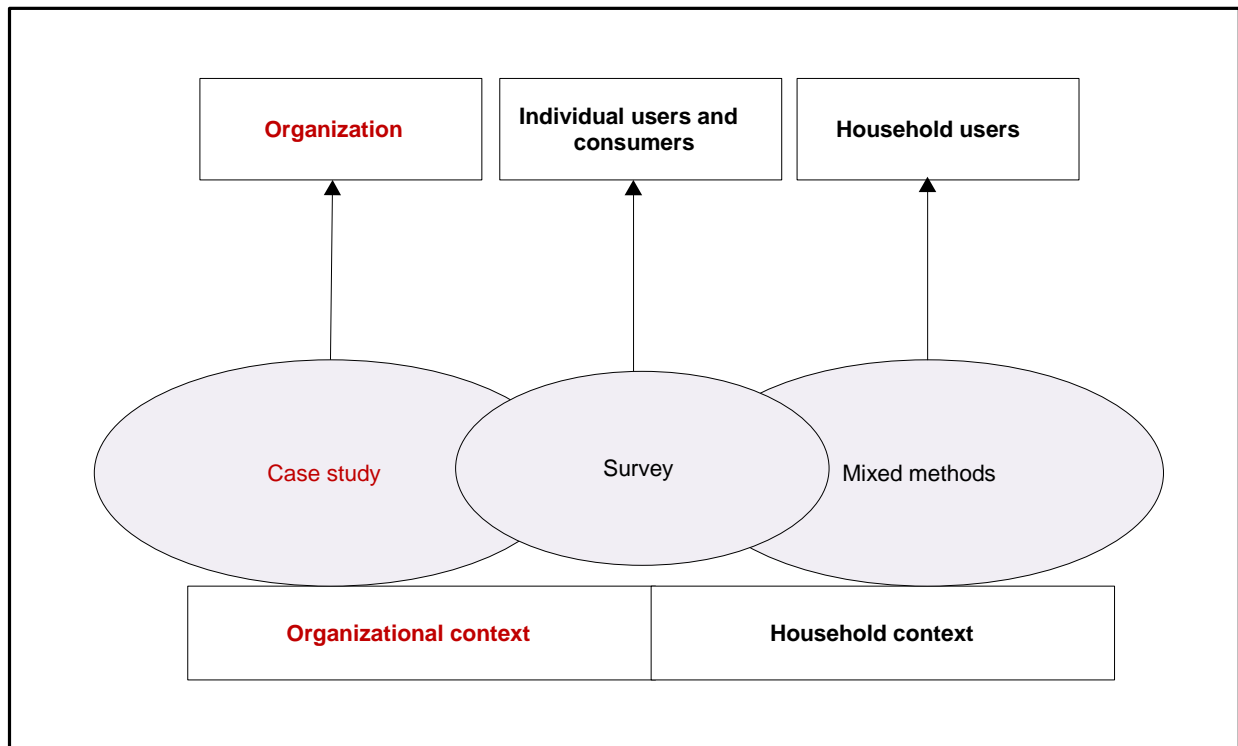
Figure 3.2: Preferred methodologies for technology adoption research. Source: Choudrie and Dwivedi (2005:9)

The figure shows that a case study is the most suitable strategy for examining technology adoption issues at the organizational level; this study therefore follows that approach. A survey using mixed methods could also have been used in this case, but due to the inductive nature of the study, the researcher focused on seeking for deep understanding of the phenomena examined, and therefore this option was excluded.

3.5 Conceptual Framework

A conceptual framework is a simple, instructive expression of the leading academic principles of a study, which is usually integrated with a literature appraisal, frequently as an independent sketch. According to Oppenheim (1992), the conceptual framework is a shared display of existing theories with individualistic elucidation of notions as well as theories. The framework for this research would need to reflect the techniques and methods employed for attainment of the research objectives. It would also highlight the way all components of this research are interrelated with each other. Thus, this framework needed to be a succession of wellarranged, cogent ideas highlighting the soundness and importance of this research to people who have interest in this field. This induced me as an investigator to be selective, to determine relevant factors and to discern specific links inside the research. Various styles can be employed to construct a conceptual framework, whether graphic or detailed; however, each style shares

the same target, which is the development of a framework by closely reviewing the main elements, variables, factors and links between different constituents of the research. The style adopted for this study was kept simple by rejecting other, more intricate, hypothetical, suggestive or causal types of framework. This study focuses closely on considering issues in the light of pertinent literature; thus, academic literature constitutes one of the strongest ingredients of the research framework.

In conjunction with this, it is important to demonstrate to the reader that the research study has been carried out by including central points that are inter-related with a considerable theoretical perspective. The detailed scaffold for the conduct of this study is given below.
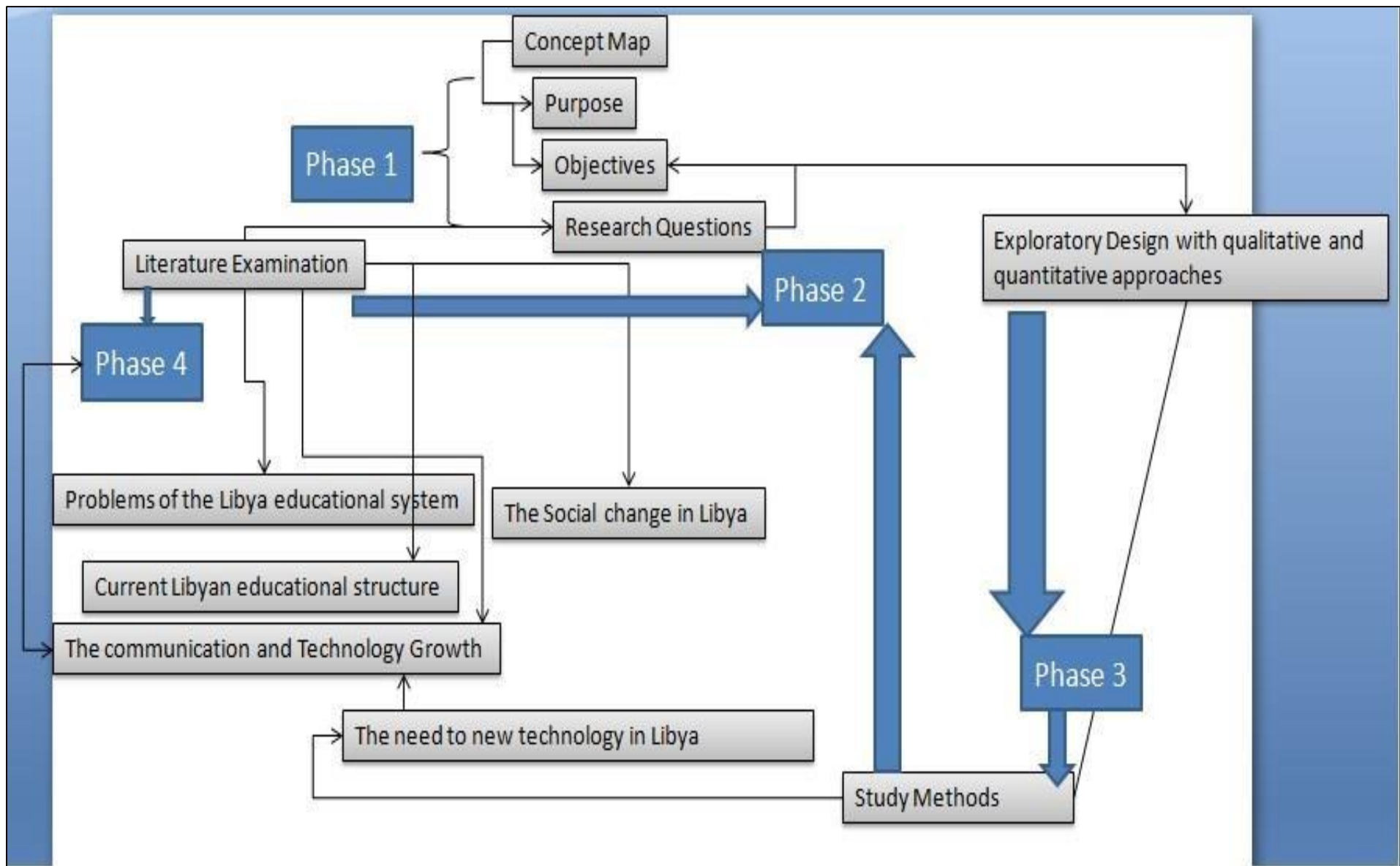
Figure   3 .3 : Conceptual framework (Oppenheim,   1992).

This framework demonstrates that the research comprises four phases encompassing dependent and independent factors. As shown in the figure, the dependent factors are the social change in Libya and the need for new technology in Libya, while the current Libyan education system, problems of the Libyan educational system, and communication and technology growth are the independent factors. The research phases are as follows:

Phase One: concept map, purpose, objectives, research questions;

Phase Two: study methods, literature examination;

Phase Three: study methods, exploratory design with qualitative and quantitative approaches;

Phase Four: growth in communication and technology, the current Libyan education structure, problems of the Libyan educational system and the need for new technology in Libya. These issues comprise the purpose of this study, together with the objectives. Moreover, the research questions are also part of this phase. This phase relates to the second phase, where the review of pertinent literature is conducted, which leads into the third phase, which talks about the methods and techniques for the attainment of research objectives and answers to the research questions. The third phase depicts that the research is designed on an exploratory basis by making use of questionnaire and interviews. The fourth phase demonstrates that within the context of communication and technology growth and the current Libyan educational structure, the research is designed to consider the need for new technology to resolve the problems in the Libyan educational system.

3.6 Types of Case Studies

Stake (2000:437, 438) identifies three different ways of selecting case studies:

- The basic case study: this type of case study focuses on studying all the cases and the researcher can generalise beyond the case or build a theory.
- The instrumental case: this type of case study is used to test generalisability or present insight into an issue. That, however, indicates that the situation has already been studied in detail and the researcher is investigating newly arising issues.
- The collective case study: this type of case study is interested in investigating several cases to study general phenomena.

This study could be considered a single embedded case study, because it focuses only on a single context (the University of Al Zawiya) and investigates specific types of Internet use (unit of analysis). Yin (2003; 2009) defines four types of case studies: single holistic; single

embedded; multiple holistic; and multiple embedded. Yin uses the term 'single' versus 'multiple' and uses 'holistic' versus 'embedded'. Basically, he distinguishes between 'single' and 'multiple' case study designs. He states that single case study designs might involve one unit of analysis or more, but wider concerns are associated with the general aspects of 'holistic' studies. In multiple case study design, more than one case is involved and the researcher focuses on all the selected cases. Yin (2003; 2009) suggests that in 'holistic' case studies, the researcher examines the total nature of a studied case, while a single case includes sub-units of analysis (embedded) and the researcher focuses on the unit. However, use of units and sub-units of analysis puts the research in a better position to obtain deeper understanding and extensive analysis of the study's situation. See Figure 4.4 below for an illustration of this.

Regarding the different ways of designing case studies, this study could be considered an intrinsic (Stake, 2005) single embedded case study (Yin, 2003; 2009), because it focuses on one organization, the University of Al Zawiya, and two different departments within it. The researcher considered that obtaining detailed data from this range of material would be sufficient to obtain a detailed understanding that would help to draw out the richer picture of the whole university. This study therefore used a single case design to obtain a real understanding of the case studied.

Yin (2009) advises selecting a 'holistic' design when the investigator cannot identify logical sub-units or when the nature of the investigated topic affects a range of phenomena. However, in order to achieve the current research targets, a single embedded design was considered to be adequate because the investigator was able to identify units of analysis to enhance opportunities for obtaining a rich understanding of the single case, and focusing on these units of analysis would enable the wider picture to be formulated by adopting crossunit analysis. Yin recommends an embedded case study design when the study aims to examine a phenomenon by focusing on several units of analysis.

In this study, the researcher intended to examine adoption of the Internet by Libyan academics, and focused on use of the Internet for communicating with students, conducting research and teaching preparation. Thus, the focus of data examination was not only applied to general Internet use, but was also applicable to examining each type of use individually first, followed by a comprehensive examination of the whole context.
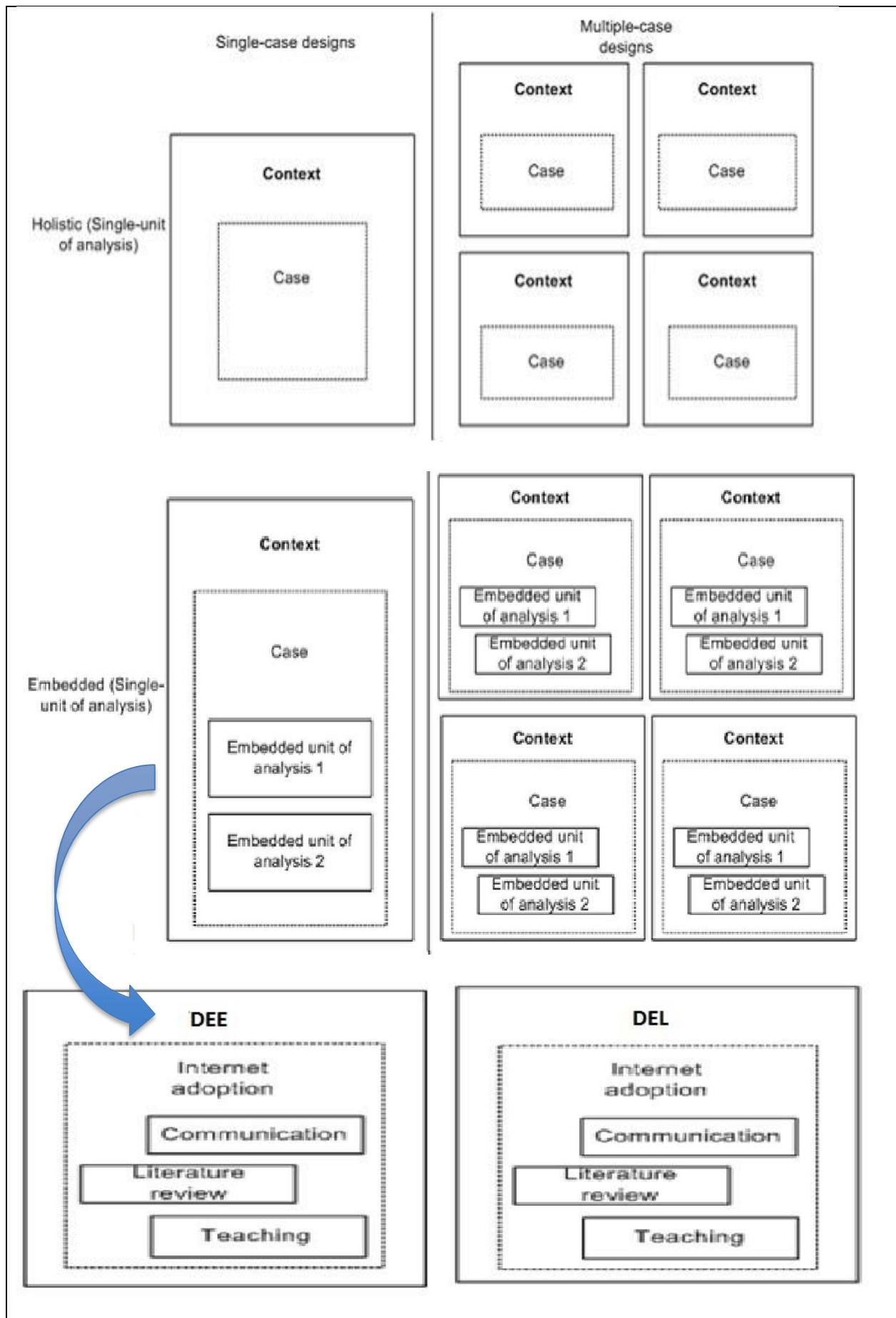
Figure 3.4: Single embedded case study design of the study, adapted from Yin (2009:46)

Previously Yin (2003) identified three types of case study:

1. Exploratory case study: used by researchers who are challenged by a shortage of related literature about the topic being examined;

2. Explanatory case study: conducted by researchers who focus on causality and aim to provide detailed explanations rather than descriptions; and

3. Descriptive case study: this type of case study is used to describe specific events in a very detailed context.

3.7 Data Collection Methods

This section provides a detailed explanation of the methods adopted for the attainment of data. In this study, both questionnaire and interviews were used for the acquisition of relevant data. Thus, the sources are questionnaire and interview responses, as well as journals, books and online libraries.

Questionnaire and interviews are the two devices employed for the conduct of this research. Both these devices enabled first-hand information and data to be obtained, which facilitated exploration and identification of the attitudes of academic individuals or professionals working in HE, and those of students studying in universities, towards using ICT in educational activities.

3.7.1 Rationale for choice of qualitative approach and questionnaire design:

As this study is interested in securing rich descriptions and a deep understanding of phenomena related to factors in Libyan HE, a qualitative approach is the appropriate one to use (Patton, 2002; Saunders, et al., 2003; Denzin & Lincoln, 2000; Sekaran, 2007; Price 2011). This research is an exploratory study; it examines peoples' experiences and the meaning they bring to a situation, which requires the researcher to dive into real life to find answers to how, why and what questions relating to the issue. Clearly, this aspect of the study focuses on words (rather than numbers), sequences of events, interaction and behaviour, and on the transformation of culture rather than prediction. Influences are studied in order to draw conclusions. In such a scenario, it is necessary to collect qualitative data and hence, this is done through semi-structured interviews and through the researcher's direct observation of events within the two case studies.

An independently reporting data compilation tool which is completed by every selected research respondent as an ingredient of research is known as a questionnaire. Information

about the ideas, moods, manners, trust, costs, opinions, traits and behaviours of research contributors is easily gathered by making use of the questionnaire tool (Oppenheirn, 1992).

Nevertheless, development of the questionnaire took several weeks of setting up, understanding, design and investigative pilot work. Questionnaire development can be difficult, as the requirements must be clear, yet direct functional statements of the concerns to be examined should be avoided. It is therefore necessary to create a blueprint for the chosen study. The main rules for development of the questionnaire for this research included:

- It must be easily understandable;

- It must not be unnecessarily lengthy and intricate;

- The questions must strictly pertain to the demands of the research topic;

- Questions must be available in multiple choice format, whilst ensuring that every likely option is given for answers.

Various means of questionnaire administration are available, such as mailed, emailed, selfadministrated, etc., but for the purposes of this research a self- and group-monitored questionnaire would be distributed among randomly selected students of the University of Al Zawiya. This was for two reasons; first to ensure completion of the questionnaire, and secondly to offer support to the participants at the time of the filling-in process. The possibility of mailing the questionnaire would be highly inappropriate, as there would be greater chances of postponement, of students not returning them, or of harm to the distributed questionnaire.

The questionnaire was structured around closed-ended questions because such questions are easy to answer, are less time-consuming, especially for students who have a tough study routine, and most importantly of all, the answers are easy to examine quantitatively. Several open-ended questions were included so the students could express their own views freely and a cover letter (see Appendix C) was attached to the questionnaire assuring the students that their answers will be treated confidentially.

A - Validity and reliability

The power of a tool to measure the assigned variables is called validity, whilst reliability refers to the uniformity with which an instrument measures. The phenomenon of validity is explained by Sekaran (2007) as an incorporated judgment of the extent to which practical data and academic foundations back up the competence and correctness of inferences or activities depending on the examination channels. To guarantee the study's strength, relevant information was obtained from peer-evaluated journals, together with figures offered by trustworthy websites. Likewise, for the sake of consistent information, the precision of the data was guaranteed by interviewing relevant groups. However, a serious check was made on the use of confusing and difficult terms, and interpretation of the interviews was done with

great care so that personal bias did not influence the results or findings (Connolly, 2007). Validity checks, which include various methods like concurrent validity, content validity, etc., must be conducted for the validation of research instruments, and for this study, the validity of the instruments was checked by:

- Careful study of whether the selected tools were effective or not;

- Checking of both the questionnaire and interview questions by the research tutor;

- Amendments being made if suggested by the tutor.

An outline of the questionnaire, together with the interview questions, were given to the tutor prior to conducting the pilot study, so that amendments could be made after obtaining the opinion of an expert. This also helped in improving the language of the questionnaire developed in English (as the questionnaire was developed in both Arabic and English). It is also necessary to understand some of the differences between quantitative and qualitative validity. Trochim (2006), for example, compares quantitative and qualitative criteria and states that qualitative validity can be evaluated according to four criteria stated by Guba and Lincoln, as listed in Table 3.4 below.

Table 3.4: Criteria for judging quantitative and qualitative research. Source: Trochim (2006:17)

Traditional Criteria for Judging Quantitative Research	Alternative Criteria for Judging Qualtitative Research
Internal Validity	Credibility
External Validity	Transferability
Reliability	Dependability
Objectivity	Confirmability

B - Triangulation

In addition to the previous criteria, the researcher hoped to improve the validity of the research by giving more consideration to the issue of triangulation. In this research, in addition to the methodology triangulation and data triangulation used in the study, theoretical triangulation was applied, which was based on combining two powerful theoretical frameworks to interpret and explain the findings.

3.7.2 Interview Techniques and the rationale of interviews Form:

The conduct of interviews can make use of various structures, i.e., prearranged, semistructured or formless, based on the sort of data that is required to be collected. An interview where similar queries are asked of the total number of participants by offering specific options for selection, and which brings in fixed replies from all participants, is described as a structured interview (Remenyi, et al.,1998).

Another type of interview, where a customary set of questions is asked of all participants, but with the divergence that the questions are open-ended, is called a semi-structured interview (Sekaran, 2007). On the other hand, unstructured interviews are an informal type of interview, where questions are asked randomly and developed during the interviews. In this study, the selected academic staff were interviewed about their perceptions regarding the use of ICT in educational activities, and a few common questions were devised by keeping in view perspectives which matched the previous investigation of ideas drawn from extensive academic material. This research aims to explore and examine the current situation of the education sector in Libya by considering its different aspects, and to identify the need to implement information technology within the system as a means of improving the quality of this sector. Taking these key aims into consideration, the semi-structured interview seemed the preferable method of gathering data because these types of aims are exploratory. To avoid the possibility of the selected academic staff at the University of Al Zawiya being unavailable, prior appointments were made with the participants on the telephone. Telephone was also the means by which the interviews with respondents were administered. Usually interviews are conducted to understand the perceptions of research participants. The procedure for conducting interviews includes determining the justification behind selecting a particular interview setting, developing guidelines for the interviews, reviewing the gathered data, and ensuring the soundness and consistency of the data obtained (Remenyi, et al.,1998). One of the advantages of the semi-structured interview, and the main reason why it was preferred over other available options for the collection of data for this study, was the detailed description which the interviewer could obtain from the interviewees. While developing the questionnaire, the questions were kept closed-ended so that distraction could be avoided, and less time was consumed on their completion. The questions for the interviews, however, were open-ended so the respondents could better express their point of view. Another reason why open-ended questions were not used for the questionnaires was the intricate handling of the responses obtained.

The second data collection method used in this research is interviews. Gray (2009) believes that interviews should "assess what they were planned to assess and nothing further". This means that questions should directly focus on the research targets and that the interviews are standardised with the same questions asked to each candidate in the same order.

The interviews aim to focus on the answer of the three sections that are cover on five questions for each section and they are:

Section A: Use of the Internet for communicating with students.

Section B: Use of the Internet for reviewing literature and writing papers.

Section C: Use of the Internet for preparing teaching materials.

The interviews aim to strengthen the validity of the findings from the questionnaire, as per the strengths associated with triangulation. In the Interviews were via the phone calls whereas; the teachers can speak freely and express in their own way and this helps them to speak without any restrictions; this offered high credibility to the researcher at the time of teacher's interview.

The interview was designed as it was 15 questions divided into three sections to provide more flexibility to the researcher to ask sub-questions when needed and the method of design of questions helps teachers to provide more information to the researcher. The researcher asked teachers to talk about the general views on the use of technology in education. The interview questions were derived from the study questions.

The researcher interviewed 12 Academic lecturers from two different school in AZU, which included two professors at same university. All the interviews via phone call were recorded and transcribed in Arabic and translated into the English. Each interview lasted between 35 and 45 minutes. Even though the researcher was aims to interviewing more, but the circumstances was extremely difficult for the researcher to travel to Libya due to the war which started in 2011. These people have various academic positions and levels of experience for using ICT **(see table 4.19)** so it was considered that their answers provided a relevant picture about the academics' attitude of ICT use in Department of Electrical Engineering (DEE) and Department of English Language (DEL).

3.7.3 Interview plan

For this study, a broad interview plan was developed so that the interviewing process could be carried out smoothly. The interview plan included important information about the interview schedule and the background of participants, together with the list of questions. However, the interview questions were made flexible so that changes could be made on the spot according to requirements. The questions for the interviews and questionnaires were devised in line with each other, so that the answers obtained by interviewing academic individuals offering services in Al Zawiya University could be used to match with the views of students studying at university regarding the use of ICT in educational activities. The tool of

semi-structured interview was therefore used to back up responses obtained from the questionnaire. The primary reason behind the selection of semi-structured interviews was the availability of choice and flexibility so that the participants could talk freely on the topic. The interviews with Al Zawiya University staff were based on the following:

- • Personal experience in the field;

- • Internet use in Libyan higher education;

- • Significance of information technology education;

- • Individual feelings regarding the use of ICT in the University of Al Zawiya;

- • Learners and syllabus.

The questions for the interviews were developed by reviewing pertinent literature regarding the use of ICT in Libyan education in particular, and in universities worldwide in general. Moreover, the questions were serially structured which helped in balancing a stream of discussion between the interviewer and participants. The transcripts of interviews were included in Appendix D.

There is no exact way of determining sample size in qualitative research, and according to Morse (2000, p.3) sample size depends on consideration of a number of factors including:

- ◆ The quality of data,

- ◆ The scope of the study,

- ◆ The nature of the topic,

- ◆ The amount of useful information obtained from each participant, ◆ The number of interviews per participant, the use of shadowed data, and

- ◆ The qualitative method and study design used.

However, from the research observations, the study that is broad in scope may require greater number of participants than one that is narrower in focus (O'Reilly & Parker,2013). the research that is more difficult to grasp and is below the surface would require more participants. The quality of the data in terms of richness, experiences and relatedness to the research questions is important to consider, the more usable data the less participants are needed.

For this research; there are two key dimensions that need to be considered when thinking about sample size. One dimension is breadth versus depth. So this links with study design as outlined by Morse (2000). Another important dimension is the quantitative analysis for another result.

This research is a PhD thesis, the size and scope of sample was limited, and extent imposed however from multi-sites. in general, the data collection was from multiple sources and qualitative and quantitative methods. it is not easy to estimate the number of participants needed in advance of the study;

Therefore, the researcher considered all these factors, to make his decision in choosing the range of the participants in this thesis. whereas the different experiences in qualitative research and looking at different sampling strategies in any research field and the methodological choice are so important.

3.8 Research Limitations

This study is subject to many constraints, and time and language limitations are primary in this context. Neither the academic staff nor the students were good at English. Few people in this context can communicate in English, so to solve this issue the services of a translator were employed. Although much effort was made to save time, completion of the research completion took six months. The random selection of academic staff for the conduct of the research is another limitation, but this constraint was overcome by the data obtained from the questionnaire, which backed up the interview responses. The research was conducted only at Al Zawiya University in Alzawia city, which is another limitation in this context. However, this constraint is justified by the fact that monetary and time resources were scarce. Moreover, the responses of the participants speak of the attitude of the majority of academic staff and students anywhere in Libya. Another important consideration is the effect of war on Libyan higher education, and indeed the whole education system. From the picture of a shrapnel-scarred blackboard inside a rubble-strewn classroom, and the heavily-armed gunmen striding between rows of empty desks as conflict and political violence surge across the Middle East, it is clear that schools - and the children and teachers that use them - are finding themselves in the line of fire. Elabbar (2016) argues that,

"… *while educational development is still a priority for the new government officials, the educational programmes in Libya suffer from limited and changeable curricula, a lack of qualified teachers (especially Libyan teachers), and a strong tendency to learn by rote rather than by reasoning, a characteristic of Arab education in general. Nonetheless, education is already free at all levels, and students receive a substantial stipend. In other words, the existing change in curriculum and poor development activities and current war influenced the teachers' way of teaching and even their knowledge of dealing with such changeable materials"* (Elabbar, 2016:40-41).

Similarly, UNICEF (2014) explains that, as following: "*In Libya, the escalation of violence since May 2014 has led to civilian casualties, considerable displacement, destruction of public infrastructure and the disruption of basic services including education. It is estimated that two million people, almost one-third of the total population, have been affected by the conflict.*
More than 434,000 people are internally displaced" (Unicef, 2014:3).

3.8.1 Obstacles to data collection:

The main obstacles of the data collection process the researcher is expecting to face are listed below:

1. The current war in Libya was one of the main difficulties the researcher might face, where he may need to get different approvals before beginning the data collection process.

2. The criteria in choice of the sample of schools, students, lecturers in AZU.

3. Different sources of data, and different aspects of questions will require the researcher to find the phone numbers to collect data, associated with different types of risks of details privacy.

4. Difficulties related to the translation process, where all interviews will need to be translated into the English language.

5. As some interviewees are senior directors in the AZU, the researcher may face difficulties in arranging the date and the time of the interviews.

3.8.2 Ethical considerations

Ethical issues in academic and professional activity are increasingly receiving attention. In this research, 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. A human being is considered a major instrument in data collection, and so plays a vital role in research. Researchers must therefore be aware of how to treat people who participate in their studies. This issue is critical in research, as Hossain (2012) explains when he summarises the basic ethical considerations mentioned by Connolly (2007). In this study, the influence of the researcher's personal views remained the biggest concern during interpretation of the interviews. The concern for secrecy was addressed by assigning codes to each interviewee instead of using his/her name or department. Moreover, the purpose of this study, together with comprehensive detail about the rights of participants, was mentioned on the consent form, so that only interested participants approached the researcher when the students were asked if they would agree to answer the questionnaire (see Appendix A-A1).

3.8.3 Evaluation of research

The value of analysis of qualitative data is dependent on the quality of the researcher's interpretation, and the final step in the analysis is an overall evaluation of that analysis (Collis & Hussey, 2003). In respect of a phenomenological study, various criteria can be invoked to assess the quality, Lincoln and Guba (1985) suggesting four as follows:

○ **Credibility** demonstrates that the research was carried out in such a manner that the subject was correctly recognised and described. Credibility can be modified by the researcher linking himself into the study for a long-lasting period, by direct observation

   of the topic under investigation to attain depth of understanding, by triangulation through using different sources of evidence, and by peer debriefing on a continuous basis. Among those techniques, the credibility of this study was enhanced by triangulating the data obtained from a variety of sources (interviews, direct observation, archival records and documentation).

○ **Transferability** is concerned with whether the findings can be generalised to another situation, and the use of two case studies increased the possibility of generalisation of the conclusions.

○ **Dependability** illustrates that the research process is systematic, rigorous and well documented; here, the researcher's training and academic experience was brought to bear to ensure the process met these conditions.

○ **Conformability** is used as a measure of whether the study has described the research method fully, and in this case it is possible to assess whether the research findings flow from the data (Lincoln & Guba, 1985).

3.9 The summary of chapter:

The chapter presented the research philosophy and adoption of action research method for this project. The research strategy and conceptual framework was described and the justification for using questionnaire and interviews as research instruments was presented.

The questions included in the questionnaire sent to the students were formulated by considering reliability, validity, bias and triangulation issues and ethical aspects. The questions included in semi-structured interviews for academics were linked with the research hypotheses.

The limitations of research approach and evaluation of research data were presented.

Next chapter will present the analysis of existing system for Internet use by students and staff by quantitative and qualitative methods applied to their answers to questionnaire and interviews.

Chapter 4: Analysis of Existing System for Internet use by Academic Staff and Students

One questionnaire with 15 questions was developed (see Appendix A) based on research hypotheses. The aim of the questionnaire was to determine the view of sixty students from AZU about the efficiency of existing system for Internet use at AZU. The research hypotheses were presented in Chapters 1 and 4, and are as follows:

HA: The present functioning of the educational system and structure in Libya is **adequate** to satisfy current educational demands to keep pace with rapid developments in the technological sphere.

HA0: The present functioning of the educational system and structure in Libya is **inadequate** to satisfy current educational demands to keep pace with rapid developments in the technological sphere.

HB: The attitudes of academic individuals and Libyan students towards ICT **are positive**.

HB0: The attitudes of academic individuals and Libyan students towards ICT **are not positive**.

Analysis of the quantitative data was done through the Statistical Package for Social Science (SPSS) version 21, but only basic statistics tests were undertaken rather than running a complex statistical analysis. Connolly (2007, pp. 243) mentions, "The *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*".

Twelve academics from two departments (DEE - Department of Electrical Engineering, DEL - Department of English Language) were interviewed by phone (the transcripts for interviews are included in Appendix B). The interview questions aimed to find out the attitudes of academics towards the use of Internet for communication with students, review publications in order to produce research papers and preparation of course materials. Qualitative methods

were used to analyse the answers for interviews. The researcher had chosen these two departments because the academics would have different purposes in their usage of the Internet and ICT tools. The links between the interviews responses and research hypotheses are included in **Table 4.20.**

The analysis of answers to questionnaires and interviews provided an original and valuable contribution of this study by improving the understanding of the adoption and Internet use by students and academics generally, and in Al Zawiya University in particular.

4.1 Questionnaire Analysis

The statistical analysis employed the most generally used numerical standards such as mean, standard deviation, one test, median and frequencies to check the results obtained; these methods were adopted because of time restraints and the intricacy of the analysis. Furthermore, a graphical analysis of the results was also prepared to make the results clearer and more easily understandable for all kinds of readers. The sample for the questionnaire survey included a random distribution of students studying in AZU, and most participants (see Table 4.1) came from different levels within the Engineering and Languages departments.

Table 4.1: Distribution of questionnaire respondents - data collected from Q2

Department	No. of questionnaires collected	Level of students				
		Undergraduate	National Diploma	Bachelors	Master's Degree	PhD
Engineering	37	3	25	2	4	3
Languages	23	1	11	6	3	2
Total	60	4	36	8	7	5

After completing the analysis of the questionnaire, which included seventeen questions, the researcher selected only eight pertinent questions that were most closely related to the research hypotheses to include in the analysis, in order to keep this research more succinct (see Table 4.20 for a full summary of the students' responses).

The results of the chosen questions were examined and analysed using the T-test function and also by measuring the frequencies of the mean and standard deviation. This was because the T-test function gives a result in which a difference between two groups is unlikely to occur if the sample happens to be atypical. Statistical significance was determined by the size of the difference between the group averages, the sample size, and the standard deviations of the groups.

Analysis of hypotheses is generally done with a T-test; this approach can be directional (onetailed) or non-directional (two-tailed) when, the other factors being equal, smaller mean differences result in statistical significance with a directional hypothesis. For the purposes of this research, the t-test used non-directional (two-tailed) hypotheses.

Standard deviation is another value used frequently in statistics. It is useful in determining how to continue research (in a set of data) depending on how much variance exists in the data. When test scores indicate there is little variance, this is represented by a small standard deviation. The standard deviation is the measure of variability of any set of numerical values in relation to the mean, and is represented by the sigma. It is found by taking the square root of the variance, which is the average of the squared differences from the mean.

4.2 Links between Answers to Questionnaire and Research Hypotheses

4.2.1 Relation between answers to Q2 and hypothesis HA

The question for Q2 was "For **which degree of Information Technology (IT) are you enrolled?**" (See Appendix A).

Thirty six participants out of sixty were enrolled for a diploma in the IT department of the university, rather than for a higher degree (see Table 4.1) such as a Master's in the field of IT. This finding may have two interpretations, i.e. first, that Libyans are not satisfied with the standard of higher degrees offered by the university department or secondly, that Libyans prefer to go abroad for higher degrees in IT. However, both conditions prove the hypothesis that states that the present functioning of the educational system and structure in Libya is adequate to satisfy current educational demands to keep pace with rapid developments in the technological sphere.

This question was asked to examine the attitude of AZU students towards the degrees and courses offered by the university, in terms of whether they are satisfied with the standards and level of courses and degrees (see Table 4.2). Thus, the result rejects the null hypothesis that states that the present functioning of the educational system and structure in Libya is inadequate to satisfy current educational demands to keep pace with rapid developments in the technological sphere, as the value of the T-test was less than the value of significance, i.e., $0.000 < 0.05$.

Table   4 .2: T - Test of question Q2

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q2a	60	2.53	1.081	.140

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q2a	18.154	59	.000	2.533	2.25	2.81

Table 4.3 shows the information obtained and examination of the results with a mean and standard deviation of 2.53 and 1.081 respectively. The standard deviation away from the mean is comparatively more inclined in the direction of the higher area, the greater part of the responses being over the mean with more than seventy two percent of the participants continuing studies for a diploma (see below).

Table   4 .3: Frequency table for question Q   2

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q2a	60	1	5	2.53	1.081
Valid N (listwise)	60				

Q2a

N	Valid	60
	Missing	0
Mean		2.53
Median		2.00
Std. Deviation		1.081
Range		4
Minimum		1
Maximum		5

Q2a

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Certification	5	8.3	8.3	8.3
	Diploma	35	58.3	58.3	66.7
	Bachelors	8	13.3	13.3	80.0
	Masters	7	11.7	11.7	91.7
	Other (please specify)	5	8.3	8.3	100.0
	Total	60	100.0	100.0	

4.2.2 Relation between answers to Q3 and hypothesis HA

The question for Q3 was **"Where would you prefer to do your PhD?"** (see Appendix A).

Forty five participants out of sixty (45/60) were determined to complete their PhD at some foreign university, while only ten participants showed an intention to attain a PhD from Al Zawiya University (see Figure 4.1), which suggests that students are not satisfied with the current standards of IT education offered in the local university. The results therefore reject hypothesis HA that the present functioning of the educational system and structure in Libya is adequate to satisfy current educational demands to keep pace with rapid developments in the technological sphere.
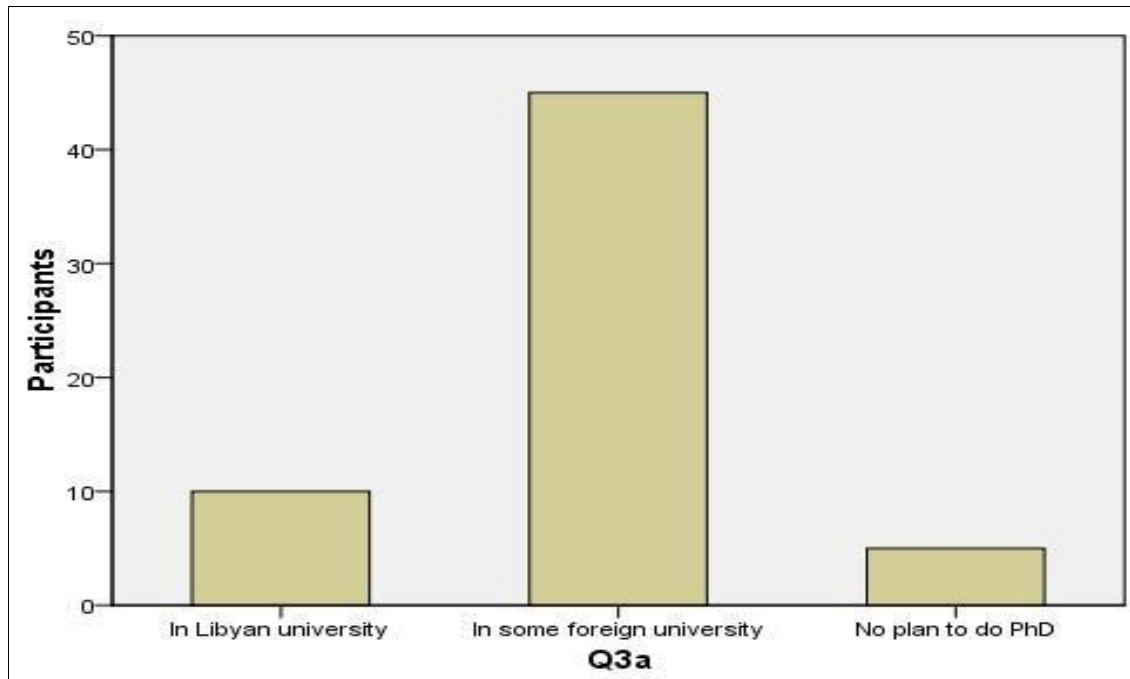
This question was added to the questionnaire survey with the aim of examining the attitude of Libyans towards the level and standard of current ICT education, which is one of the key objectives of this research; it also helps to attain the objective of making recommendations at the end of this work. The hypothesis is rejected at the value obtained by the T-test (see Table 4.4), which is lower than the value of significance, 0.000 < 0.05.

Table   4 .4: T - Test of question Q3

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q3a	60	6.92	.497	.064

One-Sample Test

	Test Value = 0.5					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q3a	99.973	59	.000	6.417	6.29	6.55

The results obtained are also supported by the mean and standard deviation values, which are 6.92 and 0.497 respectively (see Table 4.5). The value of standard deviation outside the mean is inclined to the upper area, with most responses being at or above the mean since the majority of respondents had intentions to go abroad for a PhD.

Table 4 .5: Frequency table for questio n Q3

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q3a	60	6	8	6.92	.497
Valid N (listwise)	60				

Frequencies

[DataSet1]

Statistics

Q3a

N	Valid	60
	Missing	0
Mean		6.92
Median		7.00
Std. Deviation		.497
Range		2
Minimum		6
Maximum		8

Q3a

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	In Libyan university	10	16.7	16.7	16.7
	In some foreign university	45	75.0	75.0	91.7
	No plan to do PhD	5	8.3	8.3	100.0
	Total	60	100.0	100.0	

4.2.3 Relation between answers to Q5 and hypothesis HA

The question for Q5 was "**Does the IT lab satisfy the needs of students?**" (see Appendix A). Thirty-five participants were not satisfied with the condition of the IT lab, while ten participants were satisfied with the facilities available in the lab (see Figure 4.2); however, eight participants remained neutral. These results reject the hypothesis that states the present functioning of the educational system and structure in Libya is adequate to satisfy current educational demands to keep pace with rapid developments in the technological sphere.
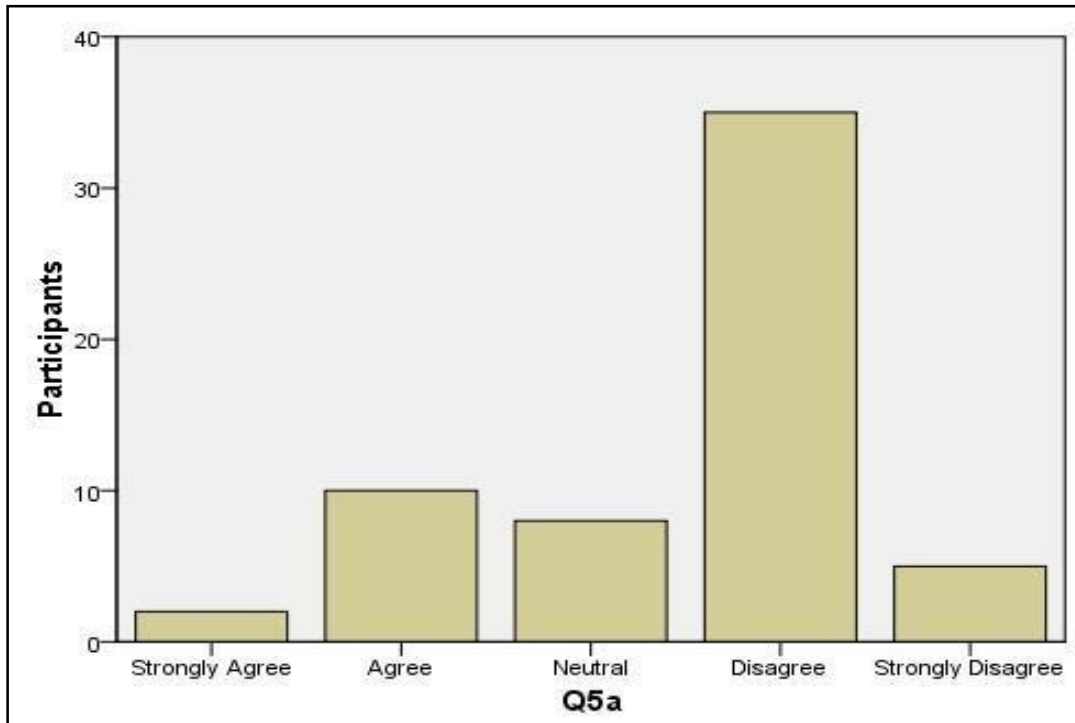
According to the coding, the testing value is taken to be 1 in differentiating between respondents who deemed the current status of lab to be acceptable and those who deemed the present position substandard; however, the value of the T-test is 0.000, which is less than the value of significance 0.05, and thus the hypothesis is not accepted (see Table 4.6).

Table   4 .6: T - Test for question Q5

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q5a	60	11.52	.983	.127

One-Sample Test

	Test Value = 1					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q5a	82.891	59	.000	10.517	10.26	10.77

Table 4.7 shows the result from the data examined with a mean of 11.52 and standard deviation of 0.983 (see below). The value of standard deviation from the mean is inclined in the direction of the lower part with a preponderance of the responses at or below the mean, as the greater number of respondents were not satisfied with the current condition of the university lab.

Table 4.7: Frequency table for question Q 5

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q5a	60	9	13	11.52	.983
Valid N (listwise)	60				

Frequencies

Statistics

Q5a

N	Valid	60
	Missing	0
Mean		11.52
Median		12.00
Std. Deviation		.983
Range		4
Minimum		9
Maximum		13

Q5a

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Agree	2	3.3	3.3	3.3
	Agree	10	16.7	16.7	20.0
	Neutral	8	13.3	13.3	33.3
	Disagree	35	58.3	58.3	91.7
	Strongly Disagree	5	8.3	8.3	100.0
	Total	60	100.0	100.0	

4.2.4 Relation between answers to Q6 and hypothesis HB

Question 6 was "**What are your fields of interest in this area?**" (See Appendix A).

Forty participants reported their interest in software programming, which supports the second hypothesis by rejecting the null hypothesis that states that the attitudes of academic individuals and students towards ICT are not positive (see Figure 4.3 and Table 4.8).
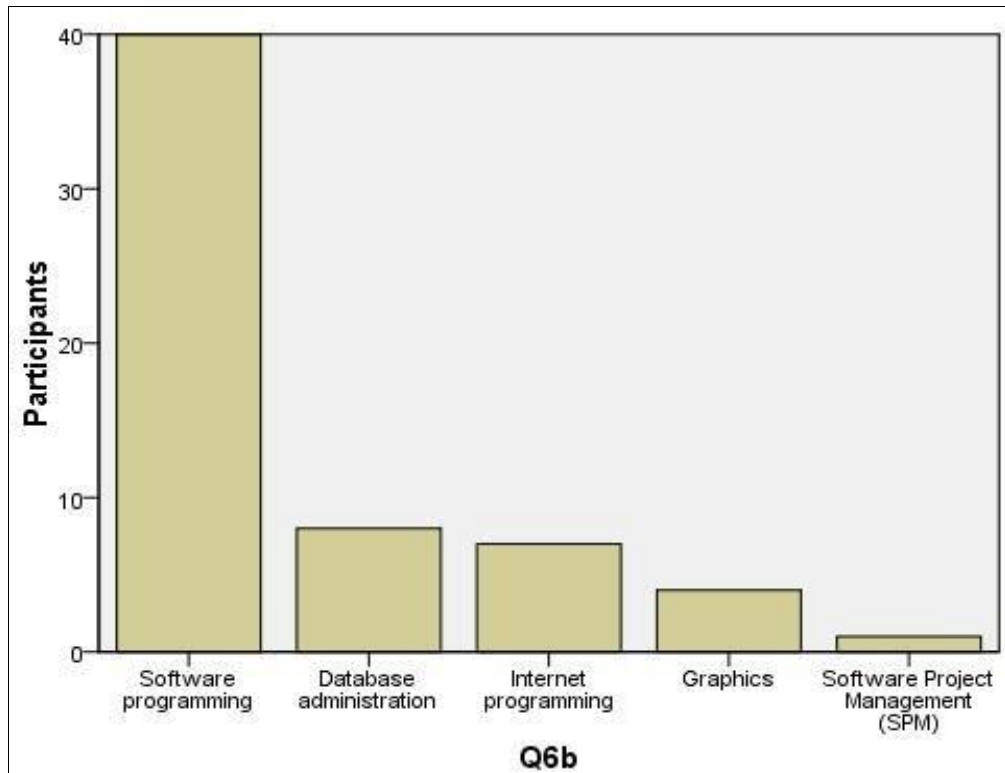
Figure 4.3: Graph of data collected for question Q6

The data analysed also support the result with a mean of 1.63 and standard deviation of 1.041 outside the mean, the results being inclined to the upper region with the majority of respondents showing an interest in the IT field (see Table 4.9).

Table 4.8: T - Test of question Q6

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q6b	60	1.63	1.041	.134

One-Sample Test

	Test Value = 2					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q6b	-2.728	59	.008	-.367	-.64	-.10

Table 4.9: Frequency table for question Q6

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q6b	60	1	5	1.63	1.041
Valid N (listwise)	60				

Statistics

Q6b

N	Valid	60
	Missing	0
Mean		1.63
Median		1.00
Std. Deviation		1.041
Range		4
Minimum		1
Maximum		5

Q6b

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Software programming	40	66.7	66.7	66.7
	Database administration	8	13.3	13.3	80.0
	Internet programming	7	11.7	11.7	91.7
	Graphics	4	6.7	6.7	98.3
	Software Project Management (SPM)	1	1.7	1.7	100.0
	Total	60	100.0	100.0	

4.2.5 Relation between answers to Q7 and hypothesis HA

Question Q7 was "**Does your university offer state-of-the-art hardware/software?**" This question was aimed at examining the current condition of ICT infrastructure in Libyan universities. According to a study in Iraq by Al-Azawei et al. (2016), "many lecturers and half of students (50%) consider ICT and e-learning illiteracy to be hindering the effective integration of e-learning. Unsurprisingly, modern instructional technologies have recently been introduced to the Iraqi Higher Education context". In the current study, thirty out of sixty participants (30/60) responded that the university does not offer state-of-the-art hardware/software (see Figure 4.4), which does not offer much evidence to support the hypothesis that the present functioning of the educational system and structure in Libya is adequate to satisfy current educational demands to keep pace with rapid developments in the technological sphere.
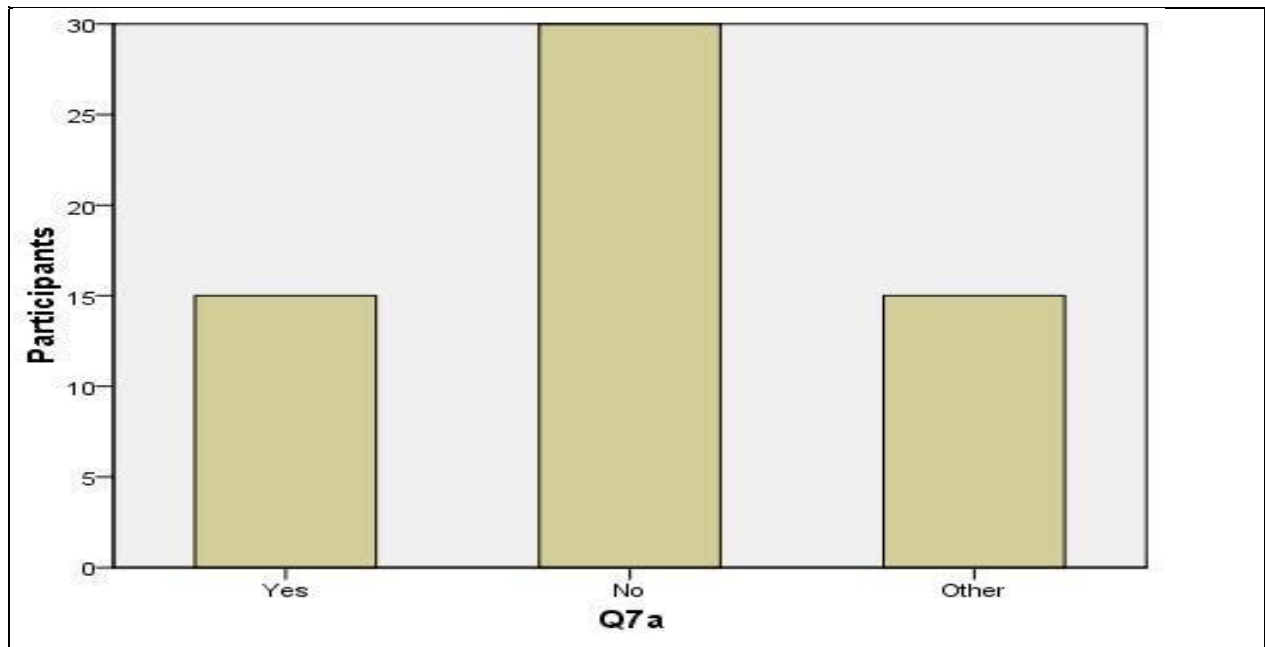
Figure   4 .4: Graph of data collected for question Q   7

It is therefore not possible to accept hypothesis HA because only half of the participants accepted HA. The results of the T-test also support this conclusion, as the value of the T-test is less than the level of significance required to accept the hypothesis (see question 7).

T able   4 .10:   T - Test of question Q7

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q7a	60	15.00	.713	.092

One-Sample Test

	Test Value = 1.5					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q7a	146.648	59	.000	13.500	13.32	13.68

Table 4.11 shows that the data examined supports the result with a mean of 15 and standard deviation of 0.713. The standard deviation from the mean is inclined to the elevated area with most of the responses at or above the mean and the majority of the respondents reporting that modern technology is not being offered at the university.

Table 4.11: Frequency table for question Q7

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q7a	60	14	16	15.00	.713
Valid N (listwise)	60				

Frequencies

Statistics

Q7a

N	Valid	60
	Missing	0
Mean		15.00
Median		15.00
Std. Deviation		.713
Range		2
Minimum		14
Maximum		16

Q7a

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	15	25.0	25.0	25.0
	No	30	50.0	50.0	75.0
	Other	15	25.0	25.0	100.0
	Total	60	100.0	100.0	

4.2.6 Relation between answers to Q12 and hypothesis HB

Question 12 was "**Why have you chosen this field of study?**" (see Appendix A).

Easy availability of a job within the country was the key reason for the selection of the IT profession according to thirty participants, while for eleven participants the prospects for foreign jobs are also high in the field of IT (see Figure 4.5).
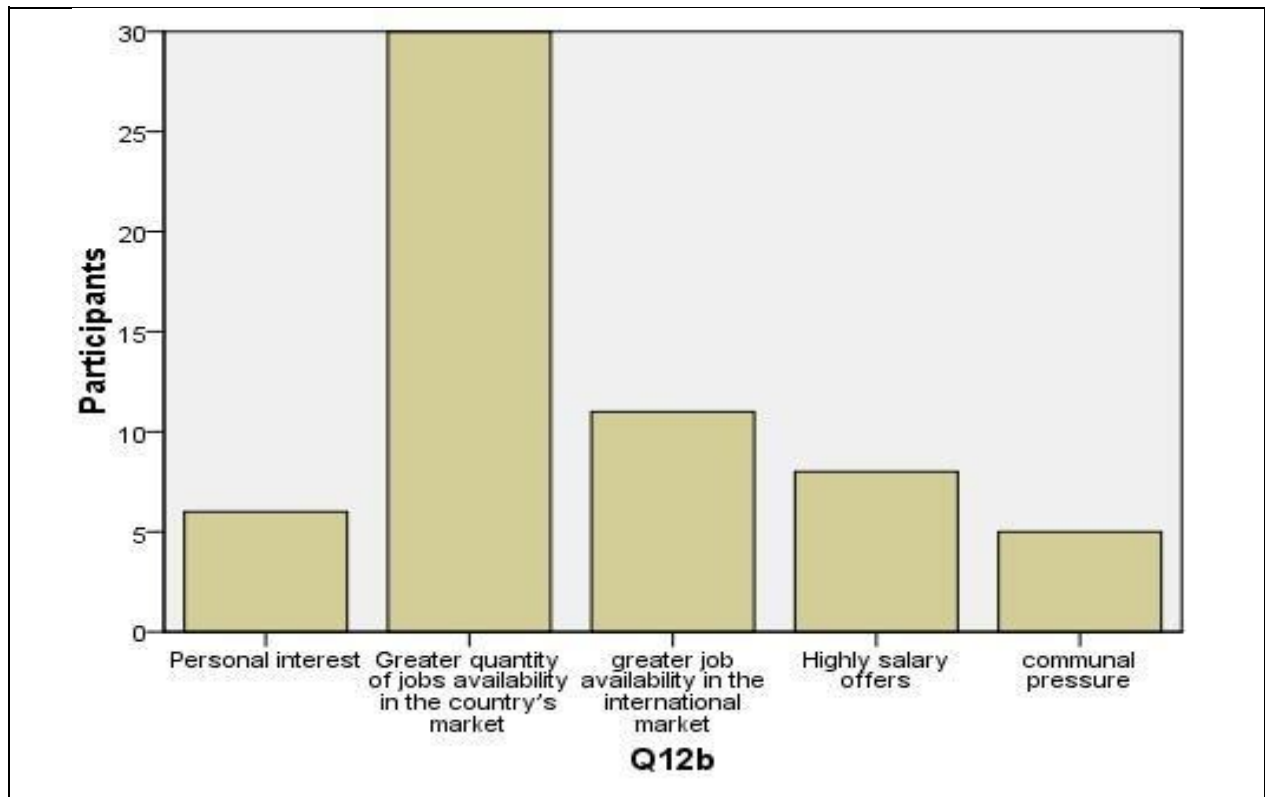
Figure 4 .5: Graph of data collected for question Q 12

In addition, six participants had chosen IT for their personal interest. These responses verify the hypothesis that states that the attitude of students at AZU is positive towards IT education and the use of ICT in the educational sphere (see question 12).

Table 4 .12: T - Test of question Q12

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q12b	60	7.60	1.108	.143

One-Sample Test

	Test Value = 2.5					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q12b	35.662	59	.000	5.100	4.81	5.39

Table 4 .13: Frequency table for question Q 12

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q12b	60	6	10	7.60	1.108
Valid N (listwise)	60				

Statistics

Q12b

N	Valid	60
	Missing	0
Mean		7.60
Median		7.00
Std. Deviation		1.108
Range		4
Minimum		6
Maximum		10

Q12b

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Personal interest	6	10.0	10.0	10.0
	Greater quantity of jobs availability in the country's market	30	50.0	50.0	60.0
	greater job availability in the international market	11	18.3	18.3	78.3
	Highly salary offers	8	13.3	13.3	91.7
	communal pressure	5	8.3	8.3	100.0
	Total	60	100.0	100.0	

4.2.7 Relation between answers to Q14 and hypothesis HB

Question 14 was **"How significant is the function of ICT in the financial growth of a state?"** (see Appendix A). For thirty-five participants the role of ICT was thought to be significant in the fiscal growth of a country, while for eight participants it was not considered very significant; this outcome speaks of a positive attitude of AZU students towards ICT, which supports the hypothesis (see Figure 4.6).
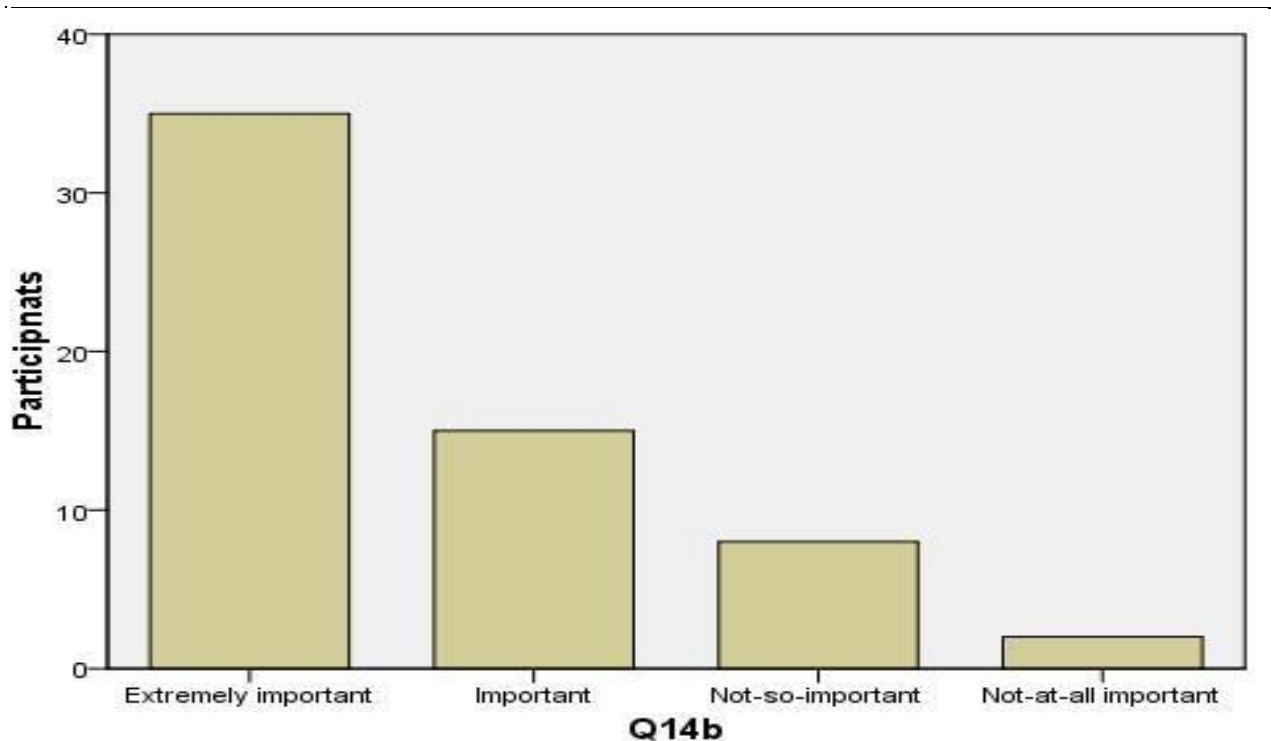
Figure 4.6: Graph of data collected for question Q14

The value of standard deviation is 0.846 above the mean, which is 11.62 as shown in (table: 4.15), inclining to the lower part with the majority of respondents deeming ICT to be significant for the financial development of a country (see question 14).

Table 4 .14: T - Test of question Q14

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q14b	60	11.62	.846	.109

One-Sample Test

	Test Value = 3					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Q14b	78.935	59	.000	8.617	8.40	8.84

Table   4 .15: Frequency table   for question Q14

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q14b	60	11	14	11.62	.846
Valid N (listwise)	60				

Frequencies

Statistics

Q14b

N	Valid	60
	Missing	0
Mean		11.62
Median		11.00
Std. Deviation		.846
Range		3
Minimum		11
Maximum		14

Q14b

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely important	35	58.3	58.3	58.3
	Important	15	25.0	25.0	83.3
	Not-so-important	8	13.3	13.3	96.7
	Not-at-all important	2	3.3	3.3	100.0
	Total	60	100.0	100.0	

4.2.8. Relation between answers to Q16 and hypothesis HA

Question 16 was "**What is the most fundamental cause of the slow development of ICT in Libya?** (Three different options can be chosen)" (see Appendix A).

Twenty of the respondents considered poor infrastructure to be the key reason for the slow development of ICT in AZU (see Figure 4.7), while just ten participants chose lack of government support as the fundamental reason. However, ten people chose the lack of technical staff as the main reason in this context.
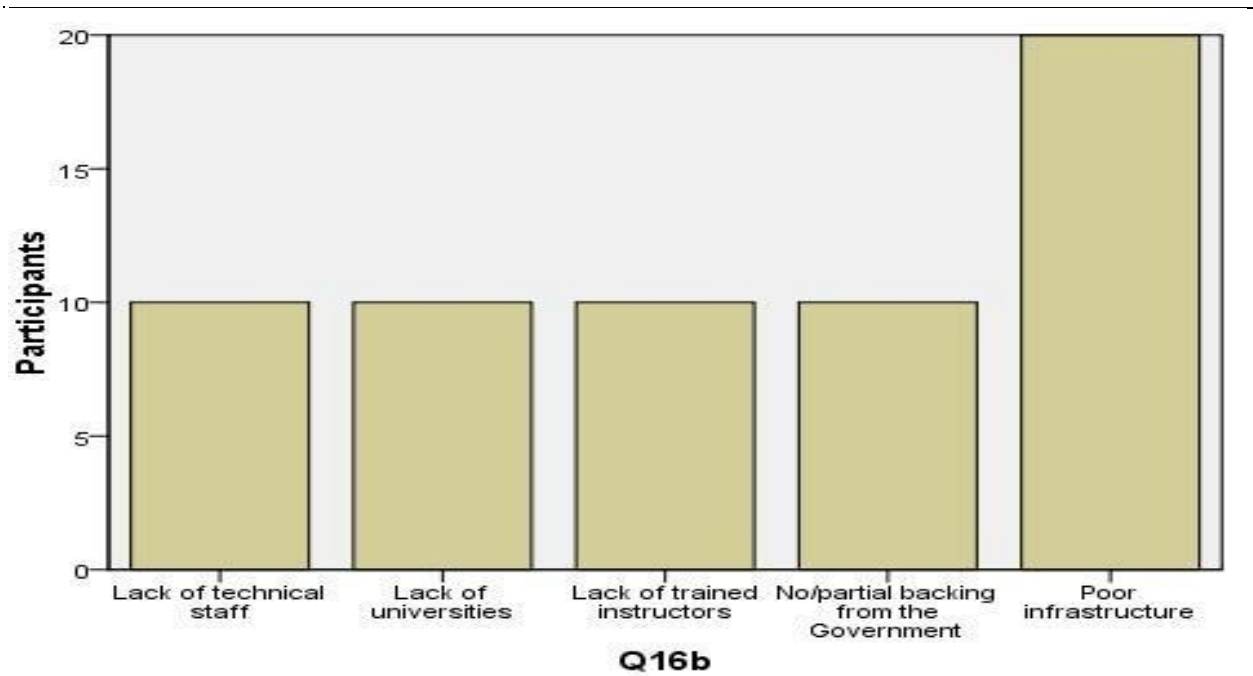
Figure 4.7: Graph of data collected for question Q14

The value of standard deviation, i.e. 1.503 ahead of the mean 17.33, leans to the lower area, with most of the responses at or below the mean and the majority of participants being displeased with the current condition of ICT facilities in the university, despite having a positive attitude towards IT education. See below:

Table 4.16: T -Test of question Q14

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Q16b	60	17.33	1.503	.194

One-Sample Test

	Test Value = 3.5					
				Mean Difference	95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)		Lower	Upper
Q16b	71.279	59	.000	13.833	13.44	14.22

The value taken for T-testing according to the coding was 3.5, which differentiates between the different reasons reported by the respondents for slow ICT development in AZU. At a level of significance of 0.05, the null hypothesis is rejected, as the value from T-testing is 0.000.

Table   4 .17: Frequency table for que   stion Q16

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q16b	60	15	19	17.33	1.503
Valid N (listwise)	60				

Statistics

Q16b

N	Valid	60
	Missing	0
Mean		17.33
Median		17.50
Std. Deviation		1.503
Range		4
Minimum		15
Maximum		19

Q16b

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Lack of technical staff	10	16.7	16.7	16.7
	Lack of universities	10	16.7	16.7	33.3
	Lack of trained instructors	10	16.7	16.7	50.0
	No/partial backing from the Government	10	16.7	16.7	66.7
	Poor infrastructure	20	33.3	33.3	100.0
	Total	60	100.0	100.0	

4.3 Analysis of Results in Light of Literature Review

• The results of the survey point out that the key issue is the sub-standard level of education in AZU, as most respondents said they would prefer to attain a PhD degree from a foreign university. This is due to the fact that the current national system of higher education is still poor with regard to new IT skills, while the skills acquired by doctors who have obtained their PhD degrees from foreign universities are at a higher level and more suitable for their work. This verifies the hypothesis that the present functioning of the educational system

and structure in Libya is inadequate to satisfy current educational demands to keep pace with rapid developments in the technological sphere.

- These results are also supported by the review of pertinent literature. According to The European Commission (2010), the major concern in Libya is the standard of education, as the requirement to teach large numbers of students during a short time span has generated a supreme crisis between the value of education and the extent of education. This is a quandary which is widespread in numerous developing states, particularly since rising numbers of students are taking an interest in the field of IT.

- As a result, the number of students in AZU is also growing rapidly, creating a huge demand for high standard education meeting global educational standards. This factor also enjoys support from the literature, as El-Sawaf (2007) writes that the number of people attaining university degrees has increased to more than 200,000, including about 70,000 students following professional and technological courses and acquiring diplomas in the university. However, although the number of students attending universities in Libya is growing fast, there is a lack of government support to develop an ICT infrastructure in the country to satisfy educational needs and standards. This is one of the key reasons for verification of the null hypothesis regarding the present underdevelopment of ICT.

- This study suggests that the functioning of the educational system and structure in Libya is indeed inadequate to satisfy current educational demands to keep pace with rapid developments in the technological sphere. Examining this result in the light of the literature, it can be said that the literature supports the findings as El-Hawat (2003) argues that the duty of administration of education in Libya has been laid on the shoulders of people's committees since 2000, including the administration of all educational schemes.

- However, the results of the survey also point towards the positive attitudes of Libyan students towards ICT, since many of the respondents were interested in software programming. This suggests the positive attitude of Libyans, as the construct of attitude is defined and regulated by means of experience, which applies an active and authoritative effect on the response of participants to all conditions with which it is connected. The second hypothesis is therefore proved by rejecting the null hypothesis that states that the attitudes of academic individuals and students towards ICT are not positive, even though the Internet is very poor, the network is very small and most of the staff have had little or no training.

- Another key point indicated by the results of the survey was the inadequate ICT facilities in AZU, which do not offer state-of-the-art software or hardware. Likewise, the poor ICT infrastructure mentioned above was seen as the key reason for the under-developed educational structure and slow development of ICT in Libya. This is also supported by the literature as, according to Kenan et al (2012), the existing syllabus structure in Libyan educational institutions requires review. A pattern needs to be sought which is not only inclusive but also contemporary, as opposed to the current structure, and this requirement includes development of the Information Technology that is vital at this period for the country and which will later help to improve the general scheme of education in the state. Moreover, Emhamed & Krishnan (2011) have indicated similar points to this research with regard to the fact that teaching staff in Libyan institutions have positive attitudes towards the use of ICT but suffer from inadequate Information Technology tools and set-up, together with insufficient spaces for computer labs, libraries and other researching rooms. These factors are responsible for weakening the operational skills of academic staff. ILO (2009) also mentions that educational institutes are built on a rental basis with no availability of overhead projectors or other equipment in classrooms.

- The majority of participants said they chose the field of IT due to a greater rate of job availability in local and international markets in this field; this suggests a consistent growth in the literacy rate, which further demands improvement of the ICT infrastructure in the country, as it is failing to keep up with current rapid developments in the technological sphere. This verifies the hypothesis that the present function of the educational system and structure in Libya is inadequate to satisfy the greater quantity of jobs available in the country's own market, rather than the availability of jobs in the international market. By examining this fact in relation to the reviewed literature, it can be stated that the government has realised the need to upgrade the ICT infrastructure in the country, particularly to meet growing educational demands. As mentioned by Elbasir (2015), there is a lack of strategic planning within organisations, a lack of technical infrastructure such as software, lack of top management support, a severe shortage of IT skills, and a lack of government support. In a similar vein, Antwi et al., (2015), Haruna (2012) and Kumaga (2010) investigated factors such as the challenge of implementing electronic payments in Ghana from a customer perspective, while Kenan et al. (2013A) explored issues in sixteen technological faculties and eighty-one higher technological and occupational institutes. Furthermore, AFDB (2012) mentions that various challenges have been confronted by the educational sector with respect to access to highly experienced and qualified teaching staff. The current study has emphasised the need for high investment efforts in the technology sphere to strengthen the poor ICT infrastructure in Libya, as the majority of respondents considered ICT to be significant to the economic growth of the country. This verifies the

hypothesis that the present functioning of the educational system and structure in AZU is inadequate to satisfy and strengthen the poor ICT infrastructure of ICT in the country, and to meet current educational demands to keep up with rapid developments in technological sphere. Moreover, the study has also indicated the increased interest of AZU students in foreign degrees, which can only be diminished by greatly increased government efforts to improve the development of ICT in the country.

Table 4.18: Summary of analysis of students' responses

Question No.	Question Summary	Responses	Hypothesis
Q2	Degree Enrolment	Inadequate educational structure to satisfy technological needs	**HA**
Q3	Tendency towards foreign higher degree	Libyans have positive attitude towards ICT and IT education	**HB**
Q5	Satisfaction of IT needs	Not satisfactory	**HB0**
Q7	State-of-art software	Insufficient	**HA0**
Q6	Interest in IT	High interest in IT	**HA**
Q12	Reasons for joining this field	More national and international jobs	**HB**
Q14	Role of ICT in economic development	Has great impact on economic development of the country	**HB**
Q16	Reasons for underdeveloped ICT field	Incapability of government and staff	**HB0**

4.4 The AZU Case Studies

Two case studies from different departments of AZU were chosen for the qualitative analysis aspect of this research. The first case study relates to the Department of English Language (DEL), whilst the second one refers to the Department of Electronic Engineering (DEE). Findings are presented from semi-structured interviews with several academic staff members; these interviews were conducted by telephone due to difficulties posed by the war in Libya. The interviewees were from various academic groups, including professors, experienced lecturers, new lecturers and teaching assistants. The number of people involved in the interviews was twelve (six from DEL + six from DEE). Appendix B contains the questions asked in the interviews and Appendix C contains a transcript of the interviews.

The aims of the interview questions were as follows:

- Aim one: to examine use of the Internet for communicating with students

- Aim two: to examine use of the Internet for reviewing literature

- Aim three: to examine use of the Internet for teaching preparation.

To make the data anonymous and avoid identifying the interviewees, the researcher used an unidentifiable coding system as follows: the first letter from each word in the formal name of the department was followed by the interviewee's number in the list of interviewees from each department. For instance, the first participant in the Department (D) of English (E) Language (L) was coded as DEL1. The same coding system was used for those from the Department (D) of Electrical (E) Engineering (E), who were coded as DEE1 and so on (see Table 4.19).

Table 4.19: The national work of the interviewees

The coding of the interviewee	Academic position
DEL☐	New lecturer (Senior Lecturer)
DEL2	Teaching assistant
DEL3	Teaching assistant
DEL4	Professor
DEL5	New lecturer (Senior Lecturer)
DEL6	Experienced (Senior Lecturer)
DEE☐	Teaching assistant
DEE2	Experienced (Senior Lecturer)
DEE3	Professor
DEE4	New lecturer (Senior Lecturer)
DEE5	New lecturer (Senior Lecturer)
DEE6	Experienced (Senior Lecturer)

4.4.1 Aim one: use of the Internet for communicating with students

☐ *Duration of Internet use*

Question A1 was "**When did you start using the Internet for contacting students?"** (See Appendix B). Responses from participants indicated that this use of the Internet was not common among academics in DEL. In other words, most of the participants reported that they did not use the Internet as a means of communication to exchange information or

opinions with their students. Only two participants had previous experience in using this technology, and that was only short-term. For instance, one mentioned that he had started using the Internet only one year previously, with the purpose of communicating with his students when they were away from the university. More specifically, he said:

> *"I started using the Internet for contacting students only two year ago; the aim was mainly to contact students who studied away from the university campus" (DEL2).*

Some academics understood the importance of online communication with students and intended to use this means of contact in the future.

> *"I look forward to being in touch with my undergraduate students in the virtual environment. However, haven't completed it yet" (DEL1).*

On the other hand, some academics did not seem to be very interested in using these tools for interacting with their students online. It turned out that they only used the Internet as a communicational means to contact colleagues, educational institutions and other organizations for official communication.

> *"Actually, I am not in contact with my students through the Internet. I use the Internet only to contact my friends, colleagues" (DEL6).*

Finally, it appears that some participants did not want to start interacting online with their students, as one of them stated:

> *"I do not use the Internet to learning with my students" (DEL5).*

Most of the DEE interviewees responded that they had only a very brief experience of using Internet communication applications, having begun using them within the previous two years. Some, however, had extensive experience in the use of the Internet for contacting postgraduate students. For example, one of the interviewees said:

> *"I started using the Internet to communicate with students only one and half years ago. However, for contacting postgraduates it was used many years ago" (DEE6).*

Place of Internet use

Question A2 was "Where do you use the Internet for contacting your students?" (see Appendix B). The aim of this question was to understand how academics feel about using the Internet for contacting their students to fulfil professional instructional needs, as well as to evaluate their experience in using the Internet for this purpose. The academics had different views about their practice. For example, they differentiated between its use on a faculty level and at a departmental or individual level, and between its use for communicating with postgraduates and communicating with other students. Analysis of the data indicated that the

most successful practices for interacting with students were at the faculty level, rather than the individual level.

The DEL academics generally used the Internet in different places, such as their own offices, the faculty computer laboratories and their homes. For example, one of the academics said:

> "Sometimes, I use the Internet in the computer lab at the Faculty of Engineering. However, some other times, I also use it at my home" (DEL4).

Similarly, another said:

> "I use the Internet in different places: sometimes in the university and sometimes in my home" (DEL6).

Most of the DEE academics indicated that they were daily users of the Internet as a means of communicating with students. The majority used the Internet for this purpose in their department or homes. What was interesting in the use of the Internet for interacting with students was that some of the members distinguished between use of the Internet for contacting undergraduate and postgraduate students. For example, one of them said:

> "I use the Internet to communicate with undergraduates only during study times, while I am in my office, but for the postgraduates the channel is usually open for all the time" (DEE6).

The DEE academics used Arabic in interacting with undergraduate students or in formal and administrative processes. They also used English for interacting with each other or with their postgraduate students, as one of them explained:

> "I use the Arabic language to communicate with undergraduate students but I also use English to communicate with my postgraduates and colleagues" (DEE6).

In general, almost all the academics looked forward to realising the same target by working to encourage users to implement Internet communication as a means of improving instructional performance. For example, one of the interviewees stated that:

> "In the university, we look forward to literate people to improve the Internet use and encourage them to interact virtually" (DEE3).

This interviewee then added:

> "The faculty formally communicates with students through the Internet, but for the academics, it's a matter of prestige" (DEE3).

Despite this, a few members indicated that they were already very happy to use the Internet as a means of interacting with their students, as shown by the following:

> "I believe that the use of the Internet in respect of dealing with students was very successful because it's a very appropriate communication means" (DEE4).

In contrast, it seemed that some academics were not as confident about using this communication channel to contact students as they were about using it for communicating with peers. One assistant lecturer said:

> "Personal communication with students is not common yet, whereas it is more commonly used between academics" (DEE1).

It is obvious that use of the Internet for communication with students is implemented at the faculty level more than departmental or individual levels. In general, the academics did not seem fully enthusiastic about using online means of communication to contact their students, particularly undergraduates.

Finally, in terms of the characteristics of their use of the Internet for interacting with students, the type of contact was either formal or informal with undergraduate or postgraduate students, as presented in Figure 4.8 below:
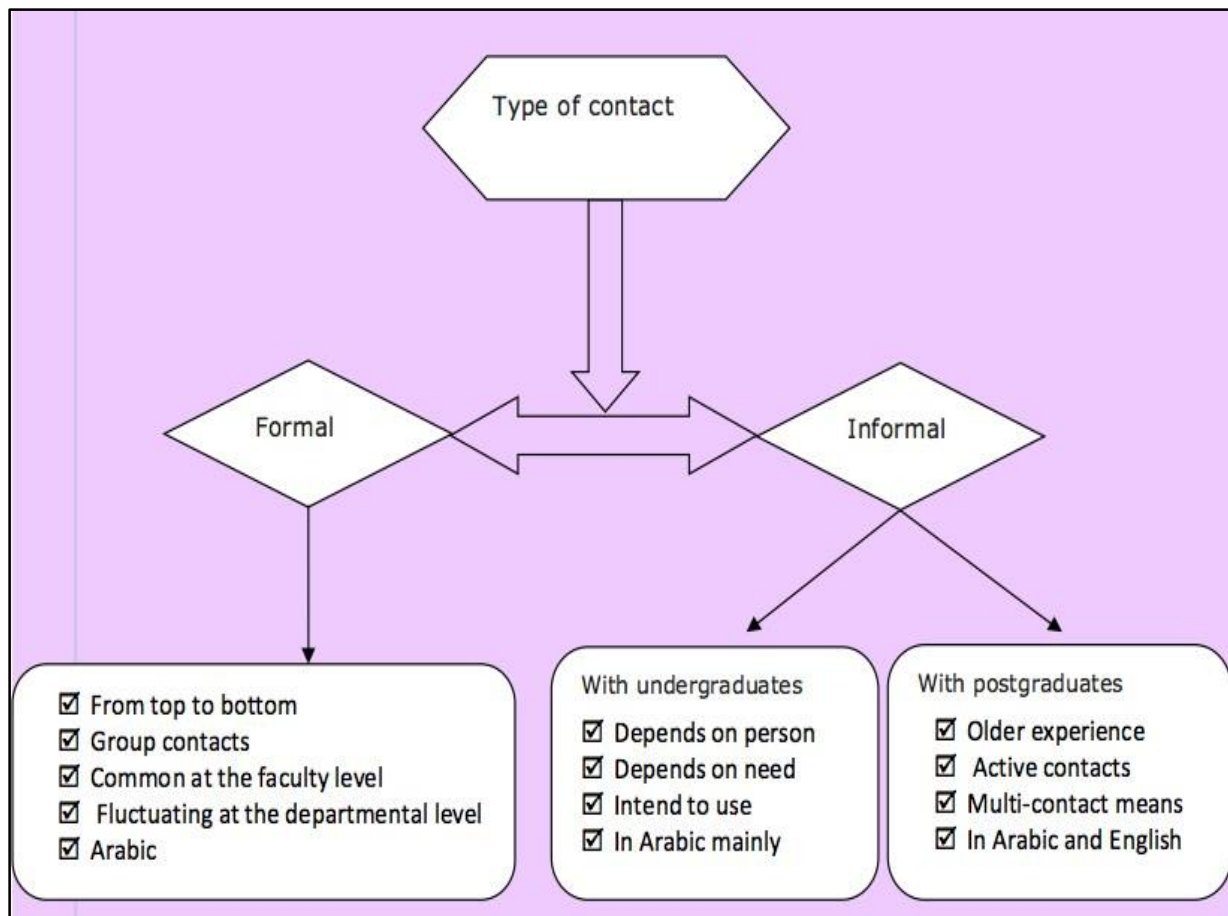
Figure 4.8: Characteristics of Internet use for contacting students in DEE

Regularity of Internet use

The participants showed that both DEL and DEE academic staff members used the Internet daily with their students. However, the participants did not specify the occurrence or time of

Internet use for communicating with their students. Question A3 was "**Which Internet applications or tools do you use for contacting students?"** (See Appendix B).

Their answers in this regard were general and unclear. The researcher has understood that the nature of their use fluctuated, based on their attitudes and needs.

> *"Usually I spend around one-two hours daily on the Internet but in terms of searching time I spend much longer" (DEL1).*

Another participant also said that the duration of his Internet use was wide-ranging and linked to his personal requirements:

> *"The length of my Internet use is connected to my requests" (DEL2)*

For DEE participants, two levels of communication were explored. On the first level, they communicated with undergraduate students by using faculty software because it was controlled, whereas they used multiple tools to communicate with their postgraduates. For example, one of the participants said:

> *"Correspondence with postgraduate students is very active; so, we use many applications in order to discuss different issues and exchange opinions" (DEE3).*

Despite this careful way of dealing with students, most members were keen on uploading their contact details into the faculty website. One of the participants said that:

> *"Almost all of academics upload their contact details onto the faculty electronic gate, including myself, even though of the long-time of it" (DEE6).*

Obstacles and factors negatively affecting use for contacting students

It appears that particular tools were dominant means of contacting students for DEL participants. For example, in response to question A4 "What obstacles do you face in using the Internet for contacting students?" (see Appendix B), one of the participants who most used the Internet for contacting students explained that he used E-mail, purely because of its popularity. He stated that:

> *"I use E-mail to get in touch with my students because they know how to use it" (DEL2).*

Another interviewee also said that:

> *"I use only Yahoo mail to contact my postgraduate students, it is better" (DEL1)*

One of the general, practical questions regarding the university website was associated with the limited amount of contact information for academic staff members at the university. Therefore, the researcher asked members if they felt happy to upload their details onto the

website to be available to the public. The study participants generally responded positively to this question. For instance, one of them said:

"I do not mind uploading my contact details on the university website" (DEL3).

One of the issues highlighted in DEE in respect of use of the Internet for communicating with students was that academics do not support using private contacting applications to communicate with their students, as shown in this answer:

"I do not support using private emails for communicating with students. We must use the university emails, but it is weak and so slow" (DEE3).

Furthermore, some female lecturers were conservative about making their contact information available to everyone on the faculty website; for example, one such lecturer answered:

"There are some female professors who do not like to upload their photos or full contact details into the university website" (DEE4).

Some of the DEE academics interviewed spoke about obstacles which affected their interactions with students online. Many of these problematic issues were associated with organizational and governmental bodies rather than the academic users themselves. However, other members stated clearly that they did not face obstacles while using online communication tools with students, as shown by the following:

"I didn't encounter any difficulties in dealing with my students through the Internet means" (DEE1).

There are psychological reasons why some reluctant academics might feel that interacting online with students could lead to losing part of their personal and professional respect; they feel the relationship should exist in classes and working times only, and openly in front of everybody. Accordingly, some did not feel confident about taking the risk and trying this new communicational experience. For example, one of the participants said:

"There is a psychological reason which hinders their acceptance to communicate with their students electronically..." (DEE2).

In addition, some of them did not feel encouraged to keep in contact with their students through these technological means because they wanted to avoid any question of a 'private' relationship with any of them, particularly with female students:

"To avoid any sensitivity, I think educators should not contact their students directly in person. Messages can be generated to all enrolled students in the study

group. Thus, transparency would help in the acceptance of this type of connection"
(DEE2).

Some of the obstacles to Internet contact were related to legitimacy. Participants in this study felt that using technological means was not official or protected by law, and therefore they did not rely heavily on their use to manage academic work or to interact with students for official instructional purposes. For example, one of the interviewed educators said:

> *"In my personal view, the most difficult thing that we have is to make this type of contacts official" (DEE4).*

Lack of training was another reason for negative responses; some of the people interviewed complained about the level of training that they had received to inspire them to introduce the new faculty system (see Figure 4.9). Some of them still found it quite difficult to shift from the usual ways of interacting with students to virtual ones. Moreover, it was observed that some members were not sufficiently qualified to professionally implement the new system because, when they were explaining their experiences of its use, they made some mistakes in selecting the right options. One of the interviewees referred to such difficulties when he said:

> *"We had a problem at the beginning with introducing the faculty software to academics. Actually, we were not trained to use the new electronic system effectively" (DEE5).*

The Language influence:

In respect of the language used for communication, question A5 was "How does the use of Arabic influence the use of the Internet for contacting students?" (see Appendix B). Most members used only Arabic with their students, while they used English for different purposes:

> *"I contact my students in Arabic. However, I use English to deal with different issues more effectively and indeed as I am happier with English" (DEL2).*

The traditional picture of the Libyan educational system has in some ways influenced the use of Internet communicational applications for instructional purposes. For example, one of the interviewees indicated that students' perceptions of use of the Internet as a communicational tool for teaching and learning had direct effects on the use of these applications. He explained that students thought the use of such means added extra learning difficulties; the effect of this worked against employing these communicational means and the students refused to use them at the beginning. More specifically, the participant said:

> *"I challenged some difficulties at the beginning when I started using the Internet regarding communicating with students for instructional purposes. Students*

hacked my email and changed my password. However, when I spoke to them in my lectures and explained that the Internet would be used as an assistant educational means and wouldn't add any extra learning to load on them, they responded completely" (DEL5).

In conclusion, the analysis of responses from the study participants showed that the academics applied Internet technology for communicating with students based more on their personal aspirations and training levels rather than on particular educational purposes.

4.4.2 Aim two: use of the Internet for reviewing literature and writing papers

A. *Duration and nature of use*

The DEL participants all had varying levels of experience of implementing the Internet for reviewing literature and writing papers, as this was one of the tasks that they had begun with. Therefore, the researcher started exploring this section by asking the question B1 "When did you start using the Internet for reviewing literature and writing papers?" (see Appendix B)

One stated that:

"I started implementing the Internet for reviewing the literature in my field in 2005. However, I consider this date as the starting point of using the Internet in my scientific life, especially when the Internet was available in the university and my house as well" (DEL2).

Another member stated that he had started using the Internet recently but believed that its use for gathering professional information was one of the major reasons that had led him to become engaged with Internet technology.

"I started using the Internet to obtain professional instrument about a year ago; this was one of my barrier purposes of Internet use" (DEL6).

The DEE academics also used the Internet for research purposes from time to time to obtain information, track their interests and renew their knowledge. Members of the study explained that they used the Internet for this specific purpose earlier than for undertaking other scholarly activities. Some mentioned that they started using it a number of years ago. Most of the academics also stated that they used the Internet for writing-related activities, mainly in their department. Members explained that they did not have any specific schedule for using the Internet for research purposes; they used it according to their needs and whenever they had free time.

B. Place and regularity of use

Through the field visits it was observed that the DEL participants did not have proper places to use the Internet for conducting research, either in the department or the faculty. However, they used the Internet search facilities in various common places, such as libraries or computer laboratories. The question here was "Where do you use the Internet for reviewing literature and writing papers?" (see Appendix B, question B2). One participant said that he used the Internet for conducting research at the central library or in his home. Similarly, another said:

> "When I do research, I used computer labs at the library" (DEL6).

A further participant said:

> "I like use the Internet in the home, especially when writing the papers" (DEL4).

He added:

> "Even though the Internet in the home is expensive, but is in the home more quickly" (DEL4).

The DEE academics indicated that the university was still unenthusiastic about providing extra places for students to use the Internet, especially for females. Therefore, the academics understood that not all students could access the Internet easily at the university. More specifically, they were certain that female students could not claim their right to Internet use, in contrast to male students. For example, one of the academics stated the following:

> "Often, I don't use the Internet for textual literature to my students because we don't have enough places for the students" (DEE5).

C. Websites and resources used

The question related to this aspect was question B3, "Which Internet websites or tools do you use for reviewing literature and writing papers?" (See Appendix B). It appears that the DEL participants were reasonably satisfied about use of the Internet for reviewing published literature. The participants spoke about their experiences in using Internet technology for obtaining up-to-date information. One interviewee stated that he depended significantly on the Internet to find required information:

> "I obtain around 70% of my required information from the Internet" (DEL3).

The value of the Internet for reviewing literature was its ability to provide a wide range of material. Participants thought that the Internet supported them in developing their professional work, particularly writing. For example, one of the participants said:

> *"... I think the most important thing is that you are linked to many modern sources of information. Thus, it supports your exploration of more subjects and helps to expand your thinking and improve the quality of your searches" (DEL6).*

Participants also thought that Internet sources of information were much more abundant and easier to use in comparison with other traditional sources of information used, such as books and journals:

> *"The Internet as a source of information is much better than traditional academic libraries" (DEL2).*

The DEE participants explained that they used different websites for seeking information in their fields of interest. Some of the websites used were professional and others were related to academic organisations. For example, some of them mentioned that they used Arabic academic websites, such as those from Saudi and Egyptian universities, and others mentioned that they used professional websites, such as the Arab Statisticians website, E-book 3000 and Science Direct:

> *"E-book 3000 is an example of the used websites to obtain free books, in addition to the Arab Statisticians website" (DEE1).*

There are many reasons to use the Internet for reviewing literature, such as for obtaining information, mapping thoughts and following up scientific events (Rhema, 2013; Kenan et al., 2014).

The participants indicated the reasons behind their use of the Internet for reviewing literature. They explained that their use of the Internet in respect of conducting research was mainly linked to seeking information, obtaining new sources of information and fulfilling search needs due to a shortage of library services and collections. For example, one of the members explained:

> *"Usually we search the Internet for references to support our arguments. However, a large proportion of available books in the library are associated with the curricula with limited frames. Furthermore, the library doesn't update its collection continuously" (DEE5).*

Some of the participants used the Internet to carry out research mainly in order to develop their understanding of topics and to link the modern ideas explored to new thought. For example, one of the interviewees said:

> *"I use sources of information on the Internet to improve my thoughts and explore the novel issues in the field" (DEE2).*

In addition, some participants favoured following up their professional interests through Internet means because this was faster and more convenient in respect of communicating with organisers. For example, one of the participants stated that:

"The Internet is a favourite tool to chase all related issues to participate in scientific conferences" (DEE3).

The study participants further discussed the availability of information resources on the Internet and compared them to other sources of information in university libraries. For example, one said that he chose to use online-based resources rather than traditional sources because of the ease of access and management.

"When we compare the availability of information resources on the Internet to the traditional information resources in libraries, we can say that the government's documents, like archives and academic work, are made available in better and easier forms" (DEL1).

One participant mentioned that he sometimes collaborated with authorised peers to access specific professional databases to obtain sources of information. On the other hand, when speaking about personal reading and information-seeking habits, one of the interviewees said:

"I prefer the stable form of books rather than any other media (electronic) forms" (DEE5).

In conclusion, it was apparent that each participant had a different experience as well as belief about using the Internet to obtain information for doing research. Overall, most of the study participants mentioned that the Internet was good for providing specific types of information and resources. However, it appears that a lack of access to professional databases and a lack of searching or filtering skills among these academics had some negative effects on their ideas about and use of the Internet.

D. Obstacles faced in using the Internet for reviewing literature

The question B4 was "What obstacles do you face in using the Internet for reviewing literature and writing papers?" (see Appendix B)

One issue regarding Internet use for researching literature was related to communicating with other researchers within or outside Libya. According to a study by Elzawi et al. (2013b), Libyan academic staff thought there were some obstacles to Internet-based training in Libyan society. In that study, analysis of questionnaires revealed a considerable amount of consistency in the responses, with a large majority of the respondents believing there would be many obstacles to the development of IT and Internet-based training in Libyan society and higher education in the future. For example, in the questionnaire responses, more than eighty nine percent (89.00%) of academic staff indicated that they deemed lack of IT training to be one of the main obstacles to using and integrating the Internet into academic teaching. They felt that they needed much more specific training to enable them to use the Internet effectively. However, some of the participants in the current research explained that the

Internet facilitated management of their communicational activities with other scholars in the field. One of the participants said:

> *"The Internet saves time and effort in contacting scholars across the globe"* (DEL4).

The language influences

The Internet also plays a significant role in helping DEL academics to improve their verbal skills continuously by using online means and materials. For example, some participants developed their interests in the field by using various online linguistic tools. The question here was "How does the use of Arabic influence your use of the Internet for reviewing literature for writing papers?" (See Appendix B, Question B5). As one explained:

> *"I use the Internet to improve my English language and look up proper definitions of local expressions"* (DEL2).

Another interviewee added:

> *"My usage for the Internet still weak as compare with the International School for the languages; our school needs to more support for the resources"* (DEL4).

However, the DEE members had varied feelings about Internet usage. The participants spoke about two different practices in respect of use of the Internet for research purposes. Some of the participants were uncertain about this experience due to their lack of IT skills, while others were totally positive about the experience and spoke enthusiastically about it. For example, one of the participants stated the following (See Appendix B, section B):

> *"Exploring the Internet materials changes the way we think, enhance our knowledge and improves speaking and lecture delivery styles"* (DEE5).

In general, the DEE participants did not speak about any significant difficulty in their Internet use, but in fact, some other issues were highlighted while discussing these issues.

4.4.3 Aim three: use of the Internet for teaching materials

A. Duration and nature of use

It seems that the DEL participants had no positive experience of using the Internet for teaching preparation. The academics interviewed explained that they did not rely on Internet sources of information to prepare their instructional materials. The question C1 was "When did you start using the Internet for preparing teaching materials?" (See Appendix B).

The first answer was as follows:

> *"I don't use the Internet normally for teaching preparation; it's not my fundamental target at all"* (DEL6).

Another participant did not see the Internet as a dependable source of information to prepare his teaching materials:

"I do not rely on Internet information resources for teaching preparation" (DEL5).

DEL2, who was an assistant lecturer, explained that he used the Internet much less for this purpose in comparison with other academic aims, such as communication and research, because he had already prepared his curricula with the senior lecturer some years before. He said:

"I do not be sure of on the Internet to search for teaching things correct. However, its usage for this purpose is less than the other scientific principles" (DEL2).

According to Elzawi et al. (2013b), Information Technology is a vital new resource for academics, which enables quick access to new research data and makes it easier to search for materials. However, while some respondents thought that using IT could sharpen a learner's skills and give him the knowledge he needs, which is important at various levels, most of the DEE participants were not active in use of the Internet for preparing teaching materials compared with their use of it for reviewing literature related to their fields. More specifically, participants spoke about a few types of practices which might be classified as individual experiences. Regarding the length of time they had used the Internet for this purpose, the answers received indicated clearly that the length of use did not exceed five years. Some of them mentioned that their usage had started with the launch of the new faculty software, but generally it was observed that many academics were not implementing it for this purpose. Participants in this department explained that they used the Internet for managing teaching activities only during working hours, mainly in their own offices. Furthermore, they used the Internet for teaching-related activities on two different levels:

- The first was related to looking for information to prepare curricula, which frequently happened between semesters and at the end of their vacations.
- The second was for teaching management, when they dealt with their teaching affairs mainly through using the faculty software.

The first answer came from a senior lecturer with extensive experience in the school; he said:

"I have started in using the Internet since it is access in our department; it was from the 2012". DEE2

Another one added:

"I am trying to improve the material of the course with include some good references and modern theories, but I am still new in the department. My effort still not realistic yet, the material preparing needs to more support in my opinion". DEE6

B. *Suitability of the Internet for teaching activities*

The DEL participants did not appear to be highly motivated to use Internet technology for teaching purposes. It seems that poor infrastructure and limited availability of professional databases in the department did not inspire them to implement this technology to enhance

their teaching. The picture of Internet use for this specific reason does not indicate that the participants intend to use this technology for this purpose in the immediate future. The appropriateness of using the Internet for delivering instructional materials was also questioned, as follows "Where do you use the Internet for preparing teaching materials?" (See Appendix B, Question C2).

Some of the answers were:

> *"Actually, I have the Internet anywhere, but I did not used it in preparing teaching materials" DEL2.*

> *"The nature of my work didn't need to Internet" DEE□.*

C. *Teaching preparation*

Use of the Internet for teaching preparation was mostly motivated by three reasons: obtaining recent information, improving teaching style and interacting online with students. The question was "**How successful is your use of the Internet for preparing teaching materials?"** (see Appendix B, Question C3).

It was clear that the DEL interviewees did not have a positive impression of the use of the Internet for teaching preparation. The participants did not see any beneficial aspects of using Internet sources of information to prepare their instructional materials. Therefore, analysis of the answers received did not indicate that people would implement this technology at the current time. For instance, one said:

> *"Internet information resources currently are not that advantageous" (DEL3).*

This was not the only case; another interviewee said:

> *"Use of the Internet for teaching activities doesn't go over 10% of my general usage" (DEL5).*

One of the participants said:

> *"I don't know if Internet technology will be a good means for delivering teaching constituents in classes. We have no experience to confirm its validity" (DEL4).*

Some participants were concerned about the quality of information available on the websites. Participants were careful about selecting teaching materials and guiding their students to specific material or websites. Other participants stated:

> *"Of course, there are some useful websites related to teaching material preparation but in fact, most these websites replicate non-credible thoughts or just personal views" (DEL5).*

Another participant also said that he does not encourage his students to rely heavily on information from Internet sources, because he wants his students to follow knowledge taught in class and to avoid scientific confusion:

> *"I guide my students only to the scientific news websites"* (DEL2).

On the other hand, DEE participants said that one of the reasons that motivated them to use the Internet was to update curricula. As one of the interviewees said:

> *"The Internet is very helpful in education because it provides all the information you need"* (DEE5).

Another of the participants explained that the Internet was useful for various teaching practices because it gave opportunities to improve teaching and learning skills:

> *"...I collect useful information, check new thoughts and develop my teaching techniques"* (DEE6).

One of the other positive features of using the Internet for teaching preparation was that academics could share some online activities with their students to improve the learning process, as this interviewee stated:

> *"In my course students are required to submit three assignments, so I should send them my comments and feedback"* (DEE3).

However, it seems that the DEE academics had less experience of using the Internet for preparing teaching materials than for other study purposes. Some participants spoke about the very limited beneficial aspects of Internet use for instruction. It was observed that most of the participants talked more about the advantages of Internet use for managing teaching administration matters than about the benefits of Internet use for teaching preparation. For instance, one of the interviewees said:

> *"At present, we register students, manage their study times, guide groups and show the results through the electronic system"* (DEE4).

Some participants explained that the use of the Internet for teaching-related activities had not yet been considered and said:

> *"The use of the Internet for preparing teaching materials is less successful in comparison with its use for contacting students or reviewing the literature for writing papers"* (DEE6).

D. *Barriers confronted*

The DEL interviewees felt there were several obstacles to using the Internet for teaching preparation. The question C4 was "What obstacles do you face in use of the Internet for preparing teaching materials?" (See Appendix B)

Some of these obstacles were associated with technology, financial issues and the quality of information on the Internet. Most of the participants believed that these constraints really discouraged the implementation of Internet technology for developing their academic work with regard to teaching preparation. According to Elzawi (2012), in order to avoid "barriers which are most likely to keep staff from using the Internet, [and] to avoid future problems in the use of the Internet for research purposes, it is necessary to discover any likely barriers and take action to remove them". It appears that the credibility and completeness of information on the Internet were seen as the factors which affected use of the Internet most considerably. One of the participants said that:

> "Information attained from the Internet is often not trustworthy. So, I do not want to deliver imprecise information to my students. Furthermore, we are required to use recognized sources of information that have been written by well-known writers in the field" (DEL3).

In addition, the lack of criticality regarding topics presented over the Internet did not meet the academic requirements of this department.

> "Many information resources obtained from the Internet did not address the issues in depth" (DEL3).

The clarity of Internet resources was another of the problematic issues when the academics required information on the Internet. Some participants explained that, whenever they sought for information, they received much related or repetitive information.

> "Information obtained from the same source is regularly repeated" (DEL5).

A shortage of technological equipment and the regular technical problems faced also affected use of the Internet for preparing teaching materials. For example, one of the participants mentioned that they still needed more technological devices and better provision of Internet services:

> "Providing computers, high speed access to the Internet and technology equipment's is still difficult" (DEL2).

More precisely, providing access to the Internet in classes was one of the major difficulties faced, which affected the use of the Internet for teaching activities as one of the participants explained:

> "The availability of the Internet in classes is considered as the major problems as they lack the use of the Internet for teaching activities. We are not capable of making interactions with our students through the Internet audio-visual material directly in classes" (DEL1).

Thus, academics in classes were unwilling to take the risk of wasting teaching time in managing technological problems:

> *"During teaching, I can't manage technical problems such as slowness and interruption of the Internet"* (DEL3).

Some professional concerns also impacted on the use of the Internet for preparing teaching materials, and negatively influenced lecturers' willingness to engage students with the use of some instructional websites. For instance, one of the participants said that he deliberately avoided taking the risk of causing scientific confusion to his students by using inaccurate information from the Internet.

> *"Students are considered as a blanket page in the field and I want them to construct correctly, precise and convincing knowledge"* (DEL2).

The status of lecturers was a further factor that de-motivated them from using Internet sources. This factor impeded the provision of instructional materials from the Internet unless they were checked in advance. This requirement relates to confirming the status of professional instructors in Libyan society, because it goes beyond delivering thoughts and reflects their need to take responsibility for what is learned.

> *"My concern about using the Internet for preparing teaching materials is linked to the use of non-credited sources of information which cause scientific confusion for the students"* (DEL4).

The major concerns of academics regarding use of Internet materials were associated with the skills students require to handle online material. Some of the participants mentioned that they were uncertain about the skills of their students regarding evaluating and using misleading information. Therefore, some participants preferred to avoid using any online educational material that might negatively affect their students' knowledge:

> *"Of course, there are many issues on the web pages that are misleading, and we need to be careful in handling information. However, as educated people, we know what we need or what to select; but I am not sure about students"* (DEL6).

Thus, some participants were not certain that their students were prepared to face these individual learning experiences. They lacked confidence that the students could select, evaluate and use the information obtained for their educational benefit, as one of the participants explained:

> *"My top fear about using the Internet was connected to students' scientific confusion and lack of information skills"* (DEL2).

With regard to the DEE participants, some of the interviewees stated that they did not face any difficulties in using the Internet for this purpose. However, Elzawi et al. (2013a) found that educational institutions failed to provide encouragement and incentives to do so, and fourteen participants (43.75%) in that study believed that not having encouragement or incentives from their institution was a barrier to their accessing the Internet. It was obvious that some of the academics were not fully encouraged to implement Internet technology for

preparing teaching materials at that time, even though they implemented it for managing some aspects of teaching and study affairs. Similarly, in this research, it seems that some of the participants were not yet committed to using the Internet for their teaching, as one interviewee indirectly revealed (see Appendix B, Section 3):

> *"We have to commit all educators to make their teaching materials available online through the university electronic system" (DEE3).*

It appears that one of the main reasons some of the participants did not choose to use Internet sources for preparing their teaching materials was the low level of credibility of the information provided, as expressed by one interviewee:

> *"I am not keen to use the Internet for teaching preparation because of the credibility of information and I have got all required materials and references in my home library" (DEE6).*

Furthermore, according to Kenan et al. (2013c), other barriers to implementation of the Internet in teaching include increased workload for academic staff; development time; delivery time; lack of extrinsic incentives/rewards; lack of strategic planning and vision; lack of support; lack of training in technological developments; and lack of support for pedagogical aspects of the developments.

E- Influence of societal culture

One of the issues which arose in respect of using the Internet for instructional preparation was associated with use of the Arabic language in teaching. Despite the large proportion of available materials, the lack of reliable websites in Arabic did not enable participants to feel sufficiently confident to guide their students to using specific instructional websites in the field. The question C5 was "How does the use of Arabic influence your use of the Internet for preparing teaching materials?" (see Appendix B), and the first reply was:

> *"I teach in Arabic and, in this case, information resources are less credible" (DEL2).*

The availability of so many English websites probably creates a negative feeling of unfairness regarding the efficient implementation of English instructional content, based on the view that the required, credited ones must be in Arabic. The second answer was:

> *"Most of the websites are available in the English language" (DEL5).*

Some participants also felt that the university did not pay enough attention to satisfying their informational needs by providing supportive instructional resources; one of them said:

> *"The university website doesn't provide required resources/journals and books in my subject" (DEL2).*

It was obvious that some DEL members were more seriously influenced by societal culture than others, and in different ways. Despite the effect of societal culture, however, the

participants expected to eventually succeed in obligating everyone to make use of the Internet, particularly for academic purposes. However, Amanze et al. (2015) suggests that "the universities communities do not have knowledge management culture. Consequently, they do not understand and perceive its key benefits in higher education. These lacks of knowledge seem to be the rationale for lack of proper IT governance to utilize any free funds for knowledge management technologies investment".

It was observed that some of the study participants preferred to communicate with their students through controlled means rather than being open to communicating with them via all available applications. Most of the participants were happy to use the faculty software as opposed to using any other communicational tools.

Some of the study participants were also quite afraid to contact anonymous or unidentified users, preferring to use safe communication systems for contacting their students to avoid any social criticism. For example, one of the participants said:

> *"My personal fears in the use of the Internet relate to being in contact with some unidentified people or aliases as this will waste our time" (DEL3).*

F- *Dependence on students' perceptions and gender considerations*

One of the difficulties encountered when using the Internet in this case was related to the perception of students and their attitudes towards using Internet technologies. As explained by some members, students in many cases did not feel positive about using the Internet:

> *"This matter is usually connected with students' positive perspectives of Internet use" (DEL2).*

This matter was based on the students' personal experience of using the Internet and on their educational expectations, which probably caused some of them to think that use of the Internet would add extra challenges to learning, as one participant suggested:

> *"Students feel that use of the Internet will add more difficulties to the educational process" (DEL4).*

Some of the study members indicated that they were not ready to share their personal and professional materials via the Internet, particularly with students. For example, one said:

> *"I don't feel happy to share everything online with my students" (DEL3).*

Another study participant shared the same opinion and decided to exclude himself from any direct online interaction with his students.

> *"I have my own private website which I do not want my students to come across...
> It includes some private contents that I do not think my students should discover"
> (DEL2).*

It seemed, therefore, that some participants preferred to limit their online relations with their students, and to restrict their virtual behaviour to known typical behaviour in order to avoid any wrong interpretation of such actions.

Furthermore, one aspect of the incompatibility issues in dealing with female students online was that the academics' behaviour might conflict with some family and societal beliefs. When the researcher inquired about this issue, one of the study members said:

> *"There is a decent matter in the use of the Internet for contacting female students, especially outside of study times where that can be considered as infringement of confidentiality" (DEL2).*

This indicates that communicating with female students it is not easy because of these social restrictions. To understand this matter, the researcher asked one of the study participants about his behaviour when needing to contact one of his female students out of university time, and he replied:

> *"I find that it is not easy to communicate with my female students when they are at homes; this might create trouble for me; or at least for them" (DEE3).*

However, according to Elzawi et al. (2012), a relevant analysis showed no obvious gender difference in terms of time spent on the Internet. Based on common sense, it is presumed that people with science backgrounds spend more time on the Internet, but the data do not support this assumption.

From all these views and different answers, the researcher then concluded by relating the outcome of the investigation to the research hypotheses in order to clarify the results; the conclusion is shown in Table 5.20.

4.5 Analysis of data from DEL interviews (Case Study 1):

Investigation of the nature of Internet usage in DEL showed that some members had little experience of using the Internet for communication in terms of contacting students. A few academics spoke about different efforts to implement Internet technology for interacting with their students; others indicated that they were interested in doing this in the future. Although all the study participants indicated that they used the Internet daily both at the university and in their homes, many explained that they did not plan to use the Internet to stay in touch with students. Also, the study members were not able to identify any specific reasons for using the Internet for communicating with students. The responses showed that the academics almost always used Arabic to communicate with students, and used Yahoo as the

contact mechanism more than any other communicational application, due to students' familiarity with it.

Members also explained that reviewing literature for writing papers was a major motive for academics to use the Internet. However, the DEL academics did not have a suitable location for using the Internet for conducting research. Not all academic staff offices were linked to the Internet network. However, the study participants explained that the reasons why the use of the Internet in academia was still common were as follows:

- General reasons: ease of use, active search tools and avoiding library limitations.

- Support for research activities: The Internet assisted the academics' expansion of their professional knowledge, allowing them to follow up the latest updates in the field, improve innovation skills and compare their studies to the latest work in the area.

- Information management: The Internet was the best source of up-to-date information in the field, and easily accessed.

- Language: participants felt that the Internet helped them to improve their knowledge of the English language.

- Communication with scholars: The Internet was felt to facilitate the creation of professional relationships with other researchers in Libya and from all over the world. However, according to Strand et al. (2015), "Teachers and English is an Additional Language (EAL) co-ordinators viewed a lack of English proficiency to be the biggest barrier to successful social and academic inclusion".

The data show that the study participants were mostly happy to use the Internet for carrying out research because of the relevance and immediacy of Internet information in comparison to such material in university library collections. However, a general lack of search skills negatively affected their use of the Internet for this purpose. Analysis of the data also showed that the most commonly used language for seeking information was English, due to the shortage of online content in Arabic.

Liu & Evans (2016) found that "The home language was sometimes seen as useful in allowing students to write down their ideas and thoughts in response to a particular task before translating them into English. Students were often aware of the differences in practices between teachers but had no understanding of the rationale. Allowing for some use early on (e.g. bilingual dictionaries, writing or sharing orally ideas in the home language), this was seen as a bridge that would lead to English only as quickly as was practicable". Because of this shortage, participants used the Internet for exploratory purposes only. In addition, the

study participants explained that they sometimes felt quite worried about moral issues related to copyright and the use of online materials.

The data also show that the academics interviewed did not rely on the Internet for preparing teaching materials due to a lack of access to professional databases, since it was expected that they would deliver only authoritative and correct information to students. Another reason why the level of intention to use the Internet for this purpose was low was because of the issue of most material being available in English while they taught in Arabic. Other obstacles, as reported by Al-azawel et al. (2016), were lack of institutional support, language obstacles, IT issues, workload and lack of time. Issues such as shortage of technological equipment, the lack of credibility of some information and the lack of students' virtual learning skills also negatively affected the use of the Internet for this purpose.

The findings from this case study also show that participants were heavily influenced by societal culture. The negative perspective of the Internet in Libyan minds negatively affected the adoption and use of this technology. It was found that the impact of societal culture occurred in two different ways. Firstly, it influenced their relationship with students, particularly with females. Academics had to consider how the public thought about using the Internet in the university, to avoid criticism. They were also required to be sensitive when they interacted online to avoid any behaviour that might conflict with the societal culture. In addition, the study participants were not very motivated to start using the Internet at that time, but hoped to see professional technological development take place and then to be able to start to use the Internet more extensively in teaching and research. The second impact of societal culture was its impact on academics' perceptions of the Internet. More specifically, participants felt the necessity of controlling online access, protecting their privacy, avoiding contacting unidentified users and rejecting non-professional contacts. Furthermore, the ideas of students in this regard were also taken in consideration, and some consideration was given to gender issues. Overall, however, the participants expected that the Internet would be implemented significantly, and that people's fears would reduce gradually over time.

With respect to identifying characteristics of the Internet, the participants identified some positive and negative characteristics and highlighted some unclassified features too. In respect of the positive features, participants felt that the Internet was a simple technology and easily used, and that the fact that it linked them to the outside world saved their time. It was also considered to be a major source of relevant, up-to-date information. Furthermore, Internet facilitates for translation helped participants to manage to obtain material in a flexible way and to follow the latest updates in their field. Regarding the negative features, some participants still found the Internet quite a strange technology in their university and felt it was not suitable for traditional teaching methods.

4.6 Analysis of data from DEE interviews (Case study 2):

The DEE members at DEE had had a relatively short experience of using the Internet for contacting their students, but the majority used the Internet daily in their departments and at home too. Almost all members had a positive hope that the Internet would help to enhance the educational process in the department and explained that they used some communicational tools to be in touch with their undergraduate and postgraduate students. Some also revealed that they used Arabic to communicate with their undergraduate students while they used English to communicate with postgraduate students. Use of the Internet for communication with students was usually implemented at the faculty level more than at departmental or individual levels. In general, however, the academics did not appear keen about using online communication methods to contact their students. The following key factors affected their online interaction with students:

- ***Online contacting tools were regarded as a formal communication channel, and this affected students' familiarity with their use.***

- ***The academics felt that students did not have enough computers to use the Internet, especially females.***

- ***There was a lack of technical support in the lab to help students and staff use the Internet.***

There was a lack of training courses to help academics keep up to date with their IT skills.

The respondents did not believe that online information was sufficient to fulfil a large part of their professional needs. Despite being specialists in the Information Systems field, the study participants preferred traditional library materials, rather than using online materials

With regard to using the Internet for reviewing literature for writing papers, the DEE study participants used the Internet mainly to obtain information, track their interests and upgrade their knowledge. Some explained that they started using the Internet for this purpose earlier than for other purposes. Furthermore, the study participants frequently used academic websites, such as those from Saudi and Egyptian universities, and some other professional and public websites such as the Arab Statisticians website. Participants also explained that they preferred to use Google and Yahoo search engines rather than others. They used both Arabic and English for Internet applications. In addition, the participants identified the following reasons behind their use of the Internet for this purpose:

- Obtaining information - seeking information to achieve research needs.
- Mapping thoughts - developing their understanding and exploring new ideas.
- Following up events - related to speed of access and the convenient means of gaining information.

In general, analysis of the data shows that the DEE participants had two different opinions about use of the Internet for the purposes studied; some were uncertain about this new

experience in higher education due to a lack of technological skills, and for other reasons discussed above. Regarding use of the Internet for preparing teaching materials, the data analysis shows that the study participants did not use the Internet extensively for this purpose. Some spoke about individual experiences which were difficult to generalize to other members of the department. However, people in DEE used the Internet for this purpose in two ways, which were seeking information for teaching purposes, and teaching management, when they managed their teaching affairs through the faculty software or other Internet applications. Motivations for the use of the Internet for this purpose can be summarised thus:

- Obtaining recent information

- Improving teaching style

- Interacting online with students.

According to Kenan et al. (2015), "considering the potential for smart object and Internet technology to meaningfully address development challenges, the opportunities appear compelling. For example, the application of sensor networks to environmental challenges, including water quality and use, sanitation, disease, and health, climate change, and natural resource monitoring, could have significant impact beyond resource management. The data derived from such applications also could be used in research contexts, assisting local scientists and universities in making unique contributions to the broader body of global scientific knowledge and providing an incentive for local academic talent to stay in country to conduct research".

Furthermore, the DEE study participants did not mention any difficulties that they faced in this regard, but it seems they were not enthusiastic about using the Internet due to the fact that the credibility level of information was too low to fulfil their needs. All study participants used the faculty software widely to manage their teaching and study affairs, but it was observed that there were two issues which affected their Internet usage:

- In providing technology, academic staff members felt that the university's top managers did not give full attention to fulfilling their technological needs.

- The limited ways of providing Internet services and information negatively affected the attitudes of some academics towards adoption and use of the Internet.

Finally, based on their personal and professional experiences, the study participants spoke about Internet characteristics. Some linked the importance of the Internet to obtaining unlimited information in Arabic and English, co-authoring with professional researchers and collaborating with different universities. However, there remain some issues with regard to average peak connection speeds. According to Akamai (2016) who said:

"in the first quarter of 2016, like the preceding quarter, average peak speeds increased across the board among the countries/regions in the top 10. Indonesia again saw the largest gain with 38%. Remaining gains were more modest, ranging from 2.0% in Mongolia and Japan to 15% in Qatar. Two countries, Libya and Yemen, saw average connection speeds below 1.0 Mbps in the first quarter of 2016, with speeds of 0.7 Mbps and 0.9 Mbps respectively."

The conclusion from analysing the answers to Question 4 - there are four academics from Department of English Language (DEL) and one academic from Department of Electrical Engineering (DEE) who are resistant in using Internet material for teaching purposes because they consider the content of not being reliable and they are keener to continue using books and other traditional resources. Ng Kai Shi (2016) has shown that the integration of ICT by teachers is influenced by intrinsic factors (beliefs about conventional teaching practices, readiness to accept changes), teachers' lack of design thinking to tackle the 'wicked problem' of ICT integration and external factors (infrastructure, technical and administrative support).

Table 4.20: Case studies questions and investigation of the research hypotheses

Department of school / The questions	Department of English Language (DEL)						Department of Electronic Engineering (DEE)					
	DEL1	DEL2	DEL3	DEL4	DEL5	DEL6	DEE1	DEE2	DEE3	DEE4	DEE5	DEE6
A. Use of the Internet for communicating with students												
1. When did you start using the Internet for contacting students?	HA0 HB	HA HB			HB0	HA0 HB0	HA0 HB0		HA HB			
2. Where do you use the Internet for contacting students?				HA HB						HA HB		HA0 HB0
3. Which Internet applications or tools do you use for contacting students?	HA HB0	HA HB0					HA HB	HA0 HB0				
4. What obstacles do you face in using the Internet for contacting students?	HA0 HB	HA0 HB0	HA0 HB			HA0 HB0					HA0 HB0	HA HB
5. How does the use of Arabic influence the use of the Internet for contacting students?		HA0 HB			HA0 HB0				HA HB		HA0 HB	HA HB0
B. Use of the Internet for reviewing literature and writing papers												
1. When did you start using the Internet for reviewing literature and writing papers?		HA HB				HA0 HB0		HA0 HB0	HA0 HB0			HA0 HB
2. Where do you use the Internet for reviewing literature for writing papers?		HA HB		HA0 HB0		HA0 HB			HA HB		HA HB	
3. Which Internet websites or tools do you use for reviewing literature for writing papers?		HA0 HB0	HB	HB							HA0 HB	

Question												
4. What obstacles do you face in using the Internet for reviewing literature and writing papers?	HA HB	HA HB	HA HB	HA0 HB0					HA0 HB0			HA0 HB0
5. How does the use of Arabic influence your use of the Internet for reviewing literature for writing papers?		HA HB		HA0 HB0		HA0 HB	HA0 HB0	HA HB0		HA0 HB0	HA HB	
C. Use of the Internet for preparing teaching materials												
1. When did you start using the Internet for preparing teaching materials?		HA0 HB0			HB0	HA0 HB0		HA HB	HA HB	HA	HA	
2. Where do you use the Internet for preparing teaching materials?		HA HB		HA0 HB0	HA HB				HA0 HB0			HA0 HB0
3. How successful is your use of the Internet for preparing teaching materials?		HA0 HB0	HA0 HB0		HA0 HB0						HA HB	
4. What obstacles do you face in use of the Internet for preparing teaching materials?	HA0 HB0	HA0 HB0	HA0 HB0		HA HB0	HA0 HB0			HA HB			
5. How does the use of Arabic influence your use of the Internet for preparing teaching materials?	HA HB		HA0 HB	HA HB	HA0 HB0	HA0 HB		HA0 HB0	HA0 HB0		HA0 HB0	

HA: The present functioning of the educational system and structure in Libya is **adequate** to satisfy current educational demands to keep pace with rapid developments in the technological sphere.

HA0: The present functioning of the educational system and structure in Libya is **inadequate** to satisfy current educational demands to keep pace with rapid developments in the technological sphere.

HB: The attitudes of academic individuals and Libyan students towards ICT **are positive**.

HB0: The attitudes of academic individuals and Libyan students towards ICT **are not positive**.

4.7 Summary of the Chapter

This chapter has presented the results of data analysis from the questionnaire which is included in Appendix A of this thesis. The questionnaires were distributed among students through their university IDs. Only sixty were found completely filled in to include in the process of analysis. These quantitative data were analysed through the Statistical Package for Social Science (SPSS), though only basic statistics tests were undertaken rather than running a complex statistical analysis.

Furthermore, this chapter has included data from two case studies undertaken in two departments in AZU. The samples for the case studies were taken from academics and lecturers in the Department of English Language and the Department of Electronic Engineering. The findings were acquired through semi-structured interviews with several academic staff members, as well as observations by the researcher on the site of the study.

The answers to the interviews were analysed using qualitative methods to fulfil the following aims:

- Aim one: to examine use of the Internet for communicating with students

- Aim two: to examine use of the Internet for reviewing literature

- Aim three: to examine use of the Internet for teaching preparation.

The next chapter will offer a novel framework for increasing the effectiveness of ICT usage for teaching, learning and research activities in Al Zawiya University. In addition, it will consider problems and solutions related to the use of ICT, improvement of Internet skills and how to increase the impact of technology on academic efficiency, through a comparison between the answers of the academics from DEE and DEL.

Chapter 5 - Novel framework for Increasing the Effectiveness of ICT usage for Teaching, Learning and Research Activities in Al Zawiya University, Libya

The novel framework for increasing the effectiveness of ICT usage for teaching, learning and research activities is based on action research approach. This chapter contains an overview of action research, analyses of an existing framework for e-learning integration. It also

describes the development of the proposed framework for increasing the effectiveness of ICT usage for teaching, learning and research activities in AZU. The stage of current situation assessment contains the comparison between the answers of academics from the DEL and DEE departments, analysis of barriers to Internet and the investigation of the internationalisation of Higher Education framework. The focus of the next stage - Design plan - is on the examination of the usage of I-Cube model for designing and implementing teaching and learning activities in modern HEIs. The activities of the implementation stage refer to the organisation of specialist training courses and usage of ASSURE model to formulate pedagogical activities for technology-led teaching and learning purposes. Finally, the Continuous evaluation and reflection stage contains details about the evaluation of the improved integrated ICT system and users' performance.

5.1 Action Research and Justification of the Framework

The cycle of action research allows practitioners to design their activities based on their knowledge and previous feedback (see Figure 5.1). It is viewed as an increasing and iterative loop process, with each cycle serving and leading into the next. In 1963, Pernecky described the initial 'Plan-stage' as determining 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 the 'Act-stage', the agreed steps are taken. The 'Collect-stage' is next, where the researchers collect data to determine whether a change has occurred. At the 'Reflect-stage', the researchers analyse the data, discuss the findings and determine the degree to which 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).

Nowadays, action research remains popular. Mei-Chuen Lin et al. (2014) have written a book entitled "Action Research: Models, Methods and Examples". This has proved a useful guide to this method for researchers; they 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 through systematic, controlled action research. 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.

The Porter Group (2015) writes that "*… some researchers have seen action research coincidentally where there is an individual or collaborative project".* It is emphasized that

lecturers could use it to 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. Action research is *"an interactive method of collecting information that's used to explore topics of teaching, curriculum development and student behaviour in the classroom"* (study.com, 2015).
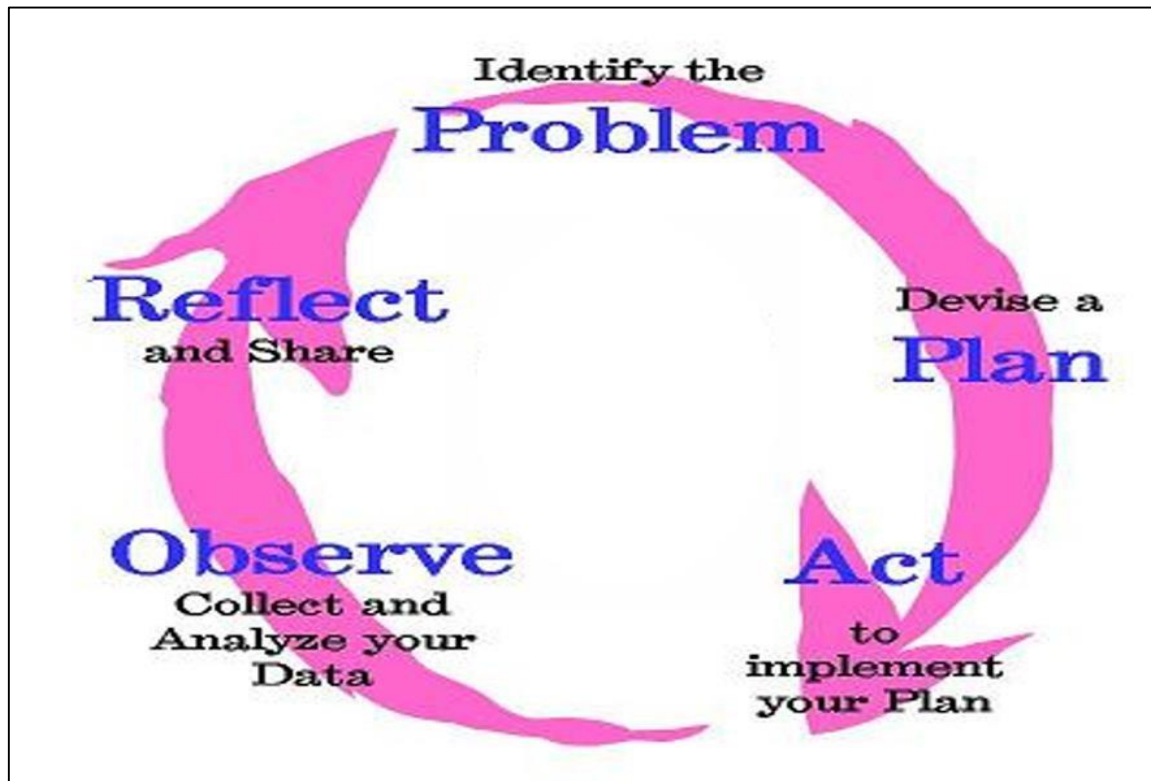
Figure 5.1: Action research stages (study.com, 2015)

5.2 Proposed Framework for Increasing the Effectiveness of ICT Usage for Teaching, Learning and Research Activities in AZU.

Kituyi and Tusubira (2013) developed a framework for e-learning integration which contains three phases: before integration, during integration and after integration. Each phase has numerous activities that should be implemented by the relevant stakeholders. The researcher found the idea of this framework suitable to be applied to ICT integration and increasing the effectiveness of its use for teaching, learning and research activities in AZU. Also, he added another stage in order to improve the framework developed by Kituyi and Tusubira so it

follows the action research approach. So, the new framework for increasing the effectiveness of ICT implementation (see Figure 5.3) has four stages as follows: Current Situation Assessment, Design Plan, Implementation of ICT system, Continuous Evaluation and Reflection.

5.2.1. Current Situation Assessment

The analysis of students answers to questionnaires (section 4.1) and the comparison between the academic's answers from DEL and DEE departments provide useful information about the level of access to the infrastructure, learner characteristics and learning environment. The current situation assessment also contains the identification of barriers to Internet usage and requirements of the internationalisation of the HE framework, so the students are exposed to global learning experience enabling them to work and live in a globally interconnected society.

5.2.1.1. Current Situation Assessment stage - Comparison between the academic's answers from DEL and DEE departments

To further understand the different attitudes towards use of the Internet for the three studied purposes, the researcher developed the following comparison in order to gather the major characteristics of Internet use for each purpose, as shown in Table 5.1.

The characteristics of Internet use in the two cases show that the departments had different attitudes towards use of the Internet for the purposes under investigation. For instance, the level of their engagement with this technology was different, while their positions towards each type of use were totally selective. Although the academics in the two departments did not actually state that they rejected use of the Internet for these studied purposes, they had different understandings of the role of Internet use for these purposes, as was clear from their individual ways of describing the significance of the Internet.

Current Situation Assessment

Activities
- Evaluate the access to the infrastructure
- Analyze ICT integration
- Examine learner characteristics
- Analyze the learning environment
- Identify current ICT resources

Relevant Stakeholders
- The university
- The leacturer
- The student
- The government team

Integration Plan →

Design Plan

Activities
- Design e -learning packages
- Design blended learning approach
- Plan specialist training courses for Lecturers and students
- Plan improvement for ICT infrastructure

Relevant Stakeholders:
- The university
- The leacturer
- The student
- The government team

Integration Strategy ↓

Implementation

Activities
- Implement e -learning systems
- Integrate face -to -face with e -learning activities
- Organise specialist training courses on technology and pedagogy
- Increase bandwidth for internet

Features:
  Virtual Learning Environment, Audio learning, Video learning, BlackBoard, Email, Moodle, chat rooms, content management and Engaging Quizzes

← **Integration ICT system**

Continuous Evaluation and Reflection

Activities
- Evaluate improved ICT integrated system
- Assess students' performance
- Evaluate lecturers' performance
- Make technological improvements
- Evaluate challenges
- Conduct continuous training
- Reflect on outcomes

↑ **Evaluation Report**

Figure 5.3: Proposed framework for increasing the effectiveness of ICT implementation

The characteristics of Internet use in the two cases show that the departments had different attitudes towards use of the Internet for the purposes under investigation. For instance, the level of their engagement with this technology was different, while their positions towards each type of use were totally selective. Although the academics in the two departments did not actually state that they rejected use of the Internet for these studied purposes, they had different understandings of the role of Internet use for these purposes, as was clear from their individual ways of describing the significance of the Internet.

Table 5.1: Comparison of the major characteristics of nature of Internet use for the studied purposes

Type of use / Department	Contacting students	Reviewing literature	Te aching preparation
DEL	- Optional use - Individual use - Influenced by societal culture	- Major reason for Internet use - Influenced by moral issues	- Rarely used
DEE	- Dominant use of faculty software - Influenced by factors such as psychological and official i ssues	- Light use	- Light use - Individual use

Therefore, the researcher made a comparison between DEL and DEE answers to more specific problems that should be solved by the novel framework. To understand this complex situation, the researcher attempted to explain the reasons behind these conflicting attitudes towards use of the Internet for the studied purposes. In order to achieve and reconstruct this explanation, the responses were laid out in sections as shown in Table 5.2 below:

Case studies / Comparison items	DEE	DEL
	"If you have got basic computer skills, then the use of the Internet becomes very easy" (DEE5). ... *students, but I use also English to communicate with my and colleagues" (DEE6).*	*"During teaching I can't manage technical problems such as the slowness and interruption of the internet"* **Internet skills** *"I use the Arabic language to communicate with my "The Internet links us to the globe and opens our eyes postgraduates to the current issues in the field" (DEL5).* **Effectiveness of online communication**
Impact on academic efficiency	*"We have some online activities designed for study purposes" (DEE3).* *"Exploring the Internet materials changes the way we think, renews knowledge and improves delivering styles" DEE5. students because with students it was very successful, because (DEL4).* *it's a very convenient communication means" (DEE4). "In the case literate people we can improve their Internet use and open more interact virtually" (DEE3). "I use the Internet mainly for obtaining new studies"*	*"I obtain around 70% of my information sources from the Internet" (DEL3).* *"I use only Yahoo mail in respect of contacting my our students because it is a well- known application" "In respect of dealing of motivating students, I will be ready to "We hope as communication channels" (DEL1). encourage them to* *(DEL4).*
	Poor library services *"A large proportion of available books in the library is associated the curriculum with limited scope" (DEE5). promote use of the Internet*	*"The limited circulation services and library conditions with information resources"* *(DEL3).*
	Availability *"There is a great quantity of scientific materials on the Internet. So, scientific books and articles for free in both Arabic and preparing teaching materials" (DEL5). the English language" (DEE4).*	*"Of course, there are some useful websites for we obtain*
Problems using	*"Correspondence with students is still limited" (DEE3).* *"We don't have enough places for the students' use of Internet (DEL1).* *access points" (DEE5).*	*"We have limited information sources in Arabic"* *"I teach in Arabic and in this case information sources*

Internet   *are less credible" (DEL2).*
                                        "Most of the websites are available in English language" (DEL5).

Table 5.2: Comparison between answers of academics from DEL and DEE

	Family, societal control and political impact	
	"As a female, at the beginning of my Internet use I suffered a lot from what people think of me" (DEE5). "Dealing with large number of technological means and applications doesn't give us opportunity to think about determinisms of cultural identity" (DEE2).	*"The problem is that parents do not accept that girls go to the Internet places which limit the effectiveness of the use" (DEL2). "The culture of the Internet use in the Libyan society is not widespread because some official bodies work to reduce its availability in order to limit its usage in the society" (DEL6).*
	Weak telecommunication infrastructure	
	"One of problems that confront us is that officials do not want to pay to obtain the Internet services" (DEE2).	*"We are not capable to make our students use audio-visual materials for learning" (DEL1). "During teaching, I can't manage technical problems such as the slowness and interruption of the Internet" (DEL3). "The university website doesn't provide required credited studies in my subject" (DEL2).*
Satisfaction using Internet	*"I think culture of dealing with the Internet will evolve with time. People at the present stage do not know about this technology. However, when they become aware of it, then they will use it better, the same as happened with mobiles" (DEE1).*	*"The Internet is very simple technology which can be used easily" (DEL4). "The Internet links us to the globe and opens our eyes to the current issues in the field" (DEL5). "The use of the Internet saves our time and energy" (DEL3).*
	Efficient access to up-to-date materials	
	"Exploring the Internet materials changes the way we think, renews our knowledge and improves delivering styles" (DEE5).	*"The Internet as source of information is much better than traditional academic libraries" (DEL2). "The Internet is easier in exploring unlimited information resources wherever you are" (DEL5). "The Internet is very simple technology which can be used easily" (DEL4).*

The DEE participants considered the Internet a significant source of information for obtaining scientific material in both Arabic and English. The Internet was also seen as a significant technology for developing work style and managing study affairs because participants believed that it facilitated their work and saved them time and effort. In addition, the Internet was perceived as an effective communication tool for contacting peers and students. On the other hand, they were reluctant to use the Internet due to the influence of some negative features, such as questioning the suitability of the Internet, the need to access specific scientific material, and the lack of academic principles guiding use of the Internet for educational purposes. Furthermore, the complexity of some of the professional tools on the Internet negatively affected the engagement of some participants.
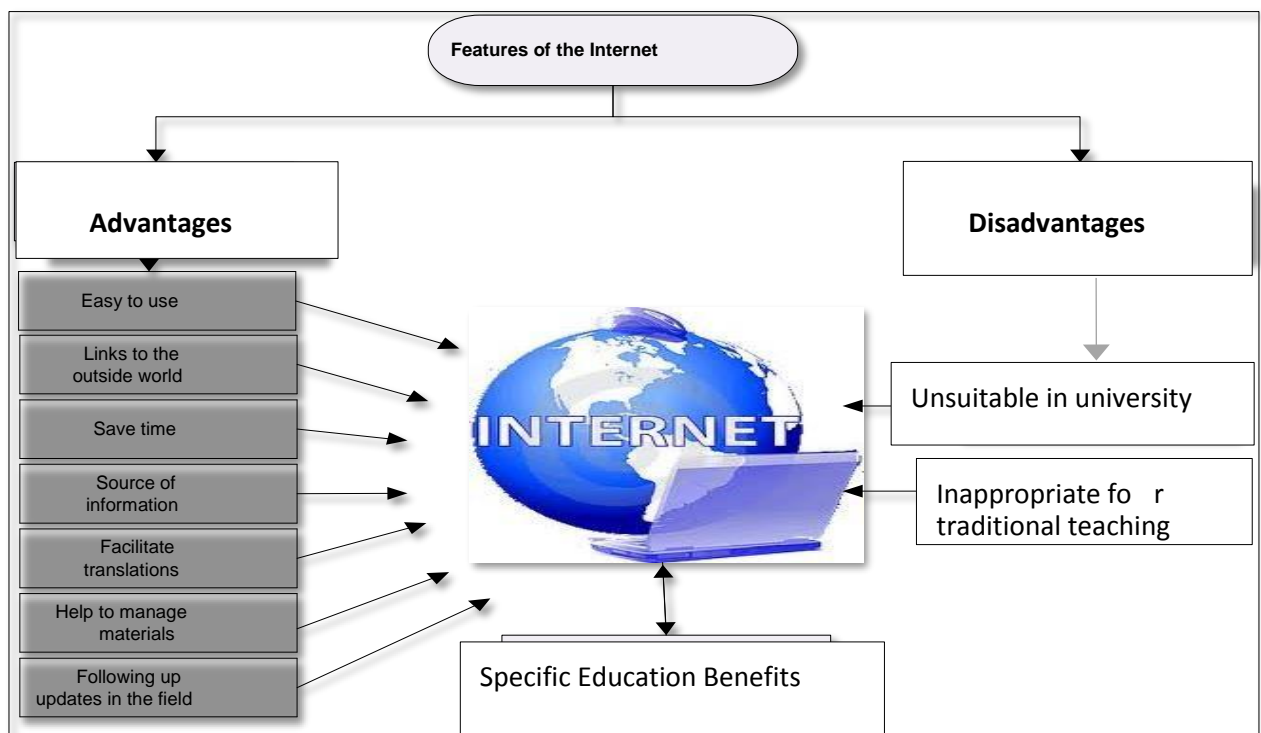
Figure 5.4: Characteristics of the Internet as seen by study participants in DEL and DEE

On the other hand, some participants were concerned about the suitability of the Internet as they believed that other academics, mainly in other faculties, were not capable of using the Internet professionally. In addition, some participants questioned the availability of the Internet for students and other university members, as they believed that not everyone in the university had good access to the Internet. Figure 5.4 provides a summary of the key features that were the strongest reasons for adoption and use of the Internet. Participants in the two studied departments were in agreement about the most common **advantages** of the Internet, as explained below.

Ease of use

The findings from the study revealed that the majority of academics perceived the Internet to be easy to use, except for a few who stated that use of some professional applications was considered difficult to learn. Many of the members explained that they did not face challenges in use of the Internet for study purposes or for other reasons (see 'Internet skills' and 'Satisfaction using Internet' cells in Table 5.2 above).

Links to the outside world

One feature of the Internet which was significantly highlighted by a great majority of the study participants was its role as a major communicational channel with the outside world. Furthermore, it was also considered as a source of professional knowledge and awareness, and important for following up the latest disciplinary developments (see 'Internet skills' cells in Table 5.2).

Saves time and effort

All the academics stated that the Internet is a helpful technology that saves them time and reduces the effort spent in doing their professional work. Most participants felt excited about use of the Internet because it helped them to reduce the time consumed in doing specific regular tasks, such as communication with others, searching for information for teaching purposes or carrying out research (see 'Satisfaction using Internet cells' in Table 6.2).

Ease of obtaining information

Almost all participants found it easy to seek for information on the Internet. In addition, the majority found it easy to obtain information, manage online materials and also store and reuse them. DEL participants explained that they used the Internet as one of the chief sources of information in their field.

> *"I believe that the Internet is so significant for obtaining up-to-date information in my area" (DEL4).*

Some of the study members used the Internet to manage ordering information resources from libraries and information centres in different locations.

> *"The importance of the Internet is related to ordering books and other information materials" (DEL1).*

Facilitating translation

DEL members used Internet translating devices to smooth the process of researching and collecting teaching materials. Highlighting the importance of using Internet translation tools, one study participant said:

> *"The Internet facilitates translating from English into Arabic and vice versa" (DEL3).*

Furthermore, effective translation mechanisms are behind the considerable utilisation of translation facilities, as one interviewee stated:

> *"The Internet translating tools are the secret behind successful use" (DEL4).*

Another participant also spoke about the provision of means of translation and the productivity of retrieving dynamics, which sometimes allowed better translations.

Managing materials and following up updates

Some of the study members said that use of the Internet facilitated managing information resources. For example, one related the ease of information collection and the ease of saving information materials thus:

> *"You can copy, download and save rich information in a small mobile device but copying library materials takes more space and it's more difficult" (DEL2).*

Similarly, other study participants said that the use of Internet materials was much easier than the use of library collections. In addition, it saved time and exertion in a very flexible way.

Two academics mentioned that the Internet was used significantly to explore the latest studies in their field. For example, one said:

> *"The main way to follow up the literature is through the Internet" (DEL3).*

Another participant also touched on the fact that the Internet was faster and more flexible with respect to tracking professional development.

> *"I search for the latest issues in the field in very fast and different ways" (DEL2).*

Not all the study participants used the Internet, but at least the majority agreed to the specific features stated above, including use of the Internet for management support.

Furthermore, it was felt that it is a fast and secure means of communication; this was more about the simplicity of the communication tools used, and also about the high level of privacy and security offered for communication among individuals and groups of users.

As mentioned above, most of the study members identified the positive features of the Internet and focused less on the negative ones. The negative features mentioned were mainly based on lack of technological experience and on the newness of the Internet to the university. One other negative factor was the perceived challenge to traditional professional practices that may be contradicted by the Internet. The next section offers further explanation of those issues which were seen as **disadvantages**:

A. *Unsuitability in university*

One of the major notes that the researcher recorded during a field visit was that the university information centre could achieve introduction of the Internet as a new technology, but could not properly introduce how to implement it for enhancing academic work. Academics in some departments were not keen on using the Internet to support communication, teaching and research at the university and therefore, use of the Internet for the previously stated academic purposes was optional rather than compulsory. Thus, achievement of the planned new technological developments faced many challenges. For example, one of the interviewees said that educators did not feel the need to use the Internet due to its association with leisure activities:

> *"The Internet might be a weird technology in the university because many people consider it as a means of entertainment" (DEL5).*

B. *Incompatibility with traditional teaching*

In addition to the novelty of the Internet at AZU, some members felt that Internet technology was inappropriate as it did not match the traditional educational system at the university. Therefore, some of the teachers were reluctant to convert to using the Internet at that stage of its development.

> *"I think that the style of our teaching is still traditional, so it is very difficult to convert others to change their minds" (DEL6).*

However, it was felt there was a need for information, caused by the lack of availability of upto-date material in the university libraries and the lack of information services provided by the libraries' staff. This issue was a strong factor in favour of use of the Internet, particularly for research purposes. The majority of participants said that they used the Internet mainly for obtaining up-to-date information in their field. Nearly all stated that they felt positive towards the Internet because of the availability of unlimited information and ease of access to that information; they also mentioned the ease of managing and sharing information. The only issue here was that the need to obtain up-to-date information was associated with writing academic research papers rather than for developing teaching materials. Furthermore, it was observed that participants usually sought for information specifically in English because of the shortage of Arabic literature available online, which also seemed to be the main reason behind the limited use of the Internet for teaching, as it must be done in their mother language.

C. *Specific educational benefits*

Due to the lack of information available about Internet use at the university, some participants did not know about the benefits that could be obtained from using the Internet in their department. For instance, one interviewee said:

> *"The Internet offers many benefits for academics. However, we still don't have a clear vision of how to benefit from these advantages by developing the academic work" (DEL6).*

This lack of knowledge about the nature of professional technological developments and the skills of Internet use reduces commitment towards the use of this technology, and also reduces attendance at training events (Wishart, et al., 2012). In AZU, this problem makes use of the Internet quite challenging and reduces awareness about the benefits of the Internet for the purposes studied.

'Benefits' refers to all the positive aspects of Internet use that can raise professional confidence or improve the quality of outcomes. Participants emphasised the advantages of use of the Internet for study purposes and attention was given to particular benefits such as facilitating work, saving time and effort and developing quality of work. In other words, the majority of participants believed that the Internet had improved their work style, made it easier to achieve professional tasks, conduct research, administer materials and communicate with others. Such advantages are summarised below.

There are many benefits to HE stakeholders of applying ICT (see Table 5.1). The intranet and e-learning enable the online environment to facilitate teaching techniques like role-play across time and distance (Hattangdi & Ghosh, 2012). They can facilitate the development of scenarios which can be rarely witnessed in practice. ICT can also play a valuable role in monitoring and logging the progress of the students across time, place and varied activities. Elzawi et al. (2013) state that differentiated ICT-based education can be expected to provide greater reliability, validity and efficiency of data collection and greater ease of analysis, evaluation and interpretation at any educational level. In the absence of ICT, most of the responsibility for teaching and learning falls on the teachers (Kenan et al., 2014).

Table 5.3: Benefits of ICT in education to the main stakeholders

Stakeholders	Benefits
Students	- Increased access between them, - Flexibility of content and delivery, - Combination of work and education, - Learner-centred approach, - New opportunities for higher quality of education and interaction.

Lecturers, administrators and employers	– High quality, cost-effective professional development in the workplace, – Upgrading of employee skills, increased productivity, – Development of a new learning culture, – Sharing of costs and of training time between employees, – Increased portability of training.
Government team	– Increased capacity and cost-effectiveness of education and training systems, – Ability to reach target groups with limited access to conventional education and training, – Ability to support and enhance the quality and relevance of existing educational structures, – Ability to ensure the connection of educational institutions and curricula to emerging networks and information resources, – Ability to promote innovation and opportunities for lifelong learning.

5.2.1.2 - Current Situation Assessment stage – identification of barriers to Internet usage

There are many barriers to the adoption and use of the Internet and virtual learning environments, the most important of which are the following:

A. Attitudes towards the Internet

The Libyan public still do not recognize the Internet as a learning tool which might be used to enhance the practice of higher education, due to the dominant image of it as entertainment. This issue was mentioned by almost all participants in the two cases, whatever their own attitude towards the Internet. It seems the dominant societal values of education still conflict with Internet educational and research values, and people still question the suitability of the Internet (Kenan et al., 2015). This factor is one of the strongest issues that hinder the engagement of academics with the Internet. As a consequence, educators find themselves in a difficult situation in relation to increasing the level of technology use and therefore, they are forced to reduce their online practice and allow more time for society to recognise that use of technology adds value to their work.

One of the interesting relations explored between factors hindering the adoption and use of the Internet at the university was related to the similar functionality of societal and political attitudes towards the Internet and the spread and use of the Internet in society. Many references and indications collected from the field suggest that political power is behind hindering the spread and use of the Internet technology in universities due to fear of openness,

a perceived need to control Internet access and the applications used in order to protect societal values and political ideology (Rhema, 2014; Othman et al., 2013; Elzawi et al. 2013b).

Indeed, senior academics have called for the protection of local academic traditions against the widespread use of the Internet, despite the fact that many traditional academics believe the Internet provides wider communication channels among university members. This issue was obvious when some educators refused to communicate online with their students, particularly outside of working hours, and also when some of them refused to communicate online with females due to the controlled access between males and females in traditional Libyan culture.

B. Arabic language

The Arabic language was associated with problematic factors that had a major impact on use of the Internet. For instance, one of these problematic issues was related to compliance with work regulations, which requires academics to mainly use Arabic for teaching. This conflicted with the fact that the dominant Internet materials are in English. Therefore, participants faced a big challenge on whether to use or refer to materials in foreign languages, particularly if they knew students would not be able to use them due to their lack of foreign language skills. Another related issue is associated with use of professional foreign software that is imported from outside the country. The participants knew that such educational systems would need many modifications to convert them into Arabic in order to fulfil their needs. Finally, the lack of trustworthy online Arabic literature limited the use of Internet materials because some participants did not wish to refer their students to unaccredited information. This issue also aligns with public concerns regarding the suitability of the Internet, because many people think that material available on the Internet does not fulfil their expectations about what should be taught (Kenan et al., 2014).

C. Gender

Gender is linked to cultural perspectives that influence use of the Internet at the university. Some societal cultural values support having limited and controlled Internet use inside the university, particularly in relation to interaction between males and females. This issue strongly affects the engagement of females with the Internet and reduces the level of their participation in online activities (Othman et al., 2013b). Furthermore, females sometimes find it difficult to use the Internet in computer laboratories and libraries inside the university because they are sure that people will question what they are doing and observe their use. However, the societal restriction around female use sometimes functions more softly and can be turned into a positive force, especially when the Internet is used within controlled

professional software which ensures females are engaged with their study interests (Elzawi & wade, 2012).

D. Lack of training and support

Lack of training and support affects adoption and use of the Internet negatively. It mainly affects use of the Internet for interacting with students and for teaching, due to lack of experience of using such technological tools. Some of the participants did not feel happy about using the Internet for teaching purposes due to frequent interruptions in Internet availability and lack of technical support. However, this problem did not have much effect on use of the Internet for research purposes due to the familiarity of the majority of academics with computers and the ease of seeking for online information. Nevertheless, some participants in DEL, and a few in DEE, mentioned that they did not receive enough training on developing their technical skills to enhance their use of the Internet for academic purposes. Also, the lack of official motivation inhibited some academics from receiving instruction and engaging with the Internet. The lack of an official requirement to attend training sessions, lack of provision of incentives and lack of awareness about the significance of the use of technology for developing higher education all reduce the level of adoption and use of the Internet at the university to some extent.

5.2.1.3. - Current Situation Assessment stage - investigation of internationalisation of the Higher Education framework

This part relates to the international dimension of HE, and how it may affect the proposed ICT framework. There is a tendency to collaborate between educational institutions across national boundaries throughout the world when students are pursuing all or parts of their studies in different countries, and when researchers and teaching staff are transferring permanently or temporarily between institutions. Therefore, HEIs need to engage with international students in creative and positive ways. They should also take advantage of opportunities to enrich their students' experience, their staff development and their research work by cooperating and working jointly with complementary institutions in other countries.

Libyan HEIs in general (and AZU as the particular case in this study) need to grasp the opportunities presented by this increasing trend towards internationalisation of HE, because the worldwide demand for HE has grown at a huge rate and in an interconnected world, knowledge and ideas have no limitations with respect to physical borders. There are several publications which describe this need, for example:

- The fact that experienced staff or talented academics, students and researchers are global in outlook and migrate towards the best opportunities is confirmed by a UNESCO report which estimates that in 2012 there were 2.8 million international students (UNESCO, 2012). Also, Kenan et al. (2014) show that growing numbers of students are studying beyond their own national borders.

- Cross-border partnerships and collaboration are changing the way that institutions work, and redefining the nature of delivery (Bakeer & Wynn, 2014).

- International experience and inter-cultural expertise are regarded as core competencies for graduates in an export-driven and innovation-based economy (Abusrewel, 2014).

Notions of ambition and scale are being redefined as emerging global economies place greater emphasis on HE; some institutions count enrolments in the hundreds of thousands, while others, including new institutions, have endowments which can reach billions of euros. Transnational education is becoming ever more important and is based on innovations such as branch campuses, e-learning/distance learning and joint degree programmes. In some countries, it has become more important than the teaching of international students on home campuses. This is the important stage on which Libyan HEIs should operate and it clearly demands a strategic approach to internationalisation and global engagement.

Internationalisation in LHEIs should be multi-faceted and encompass a range of practices and activities that have implications for all related institutions in Libya generally. In its widest sense, internationalisation includes:

- Attracting more international students into Libya;

- Making it easier for Libyan staff to increase academic efficiency;

- Supporting international students to engage in research work abroad;

- Making Libya an attractive destination for talented overseas faculties;

- Establishing more collaborative institutional and research links to internationalising curricula;

- Developing the Libyan relationship in transnational education (delivering Libyan academic programmes overseas and establishing Libyan-linked institutions outside of Libya);

- Contributing to overseas development and multilateral initiatives;

- Enhancing internationalisation and embracing the benefits at home and abroad;

- Realising the advantages and opportunities of Libya's place in Africa;

- Understanding the importance of partnership between government and institutions;

- Creating a competitive global environment and internationally competitive institutions;

- Internationalising the curriculum;

- Integration and student support;

- Growth and sustainability;

- Inter-institutional collaboration in LHEIs; ○ Funding.

5.2.2. Design Plan stage - examining the I-Cube model for the design and implementation of teaching and learning activities in modern higher education institutions
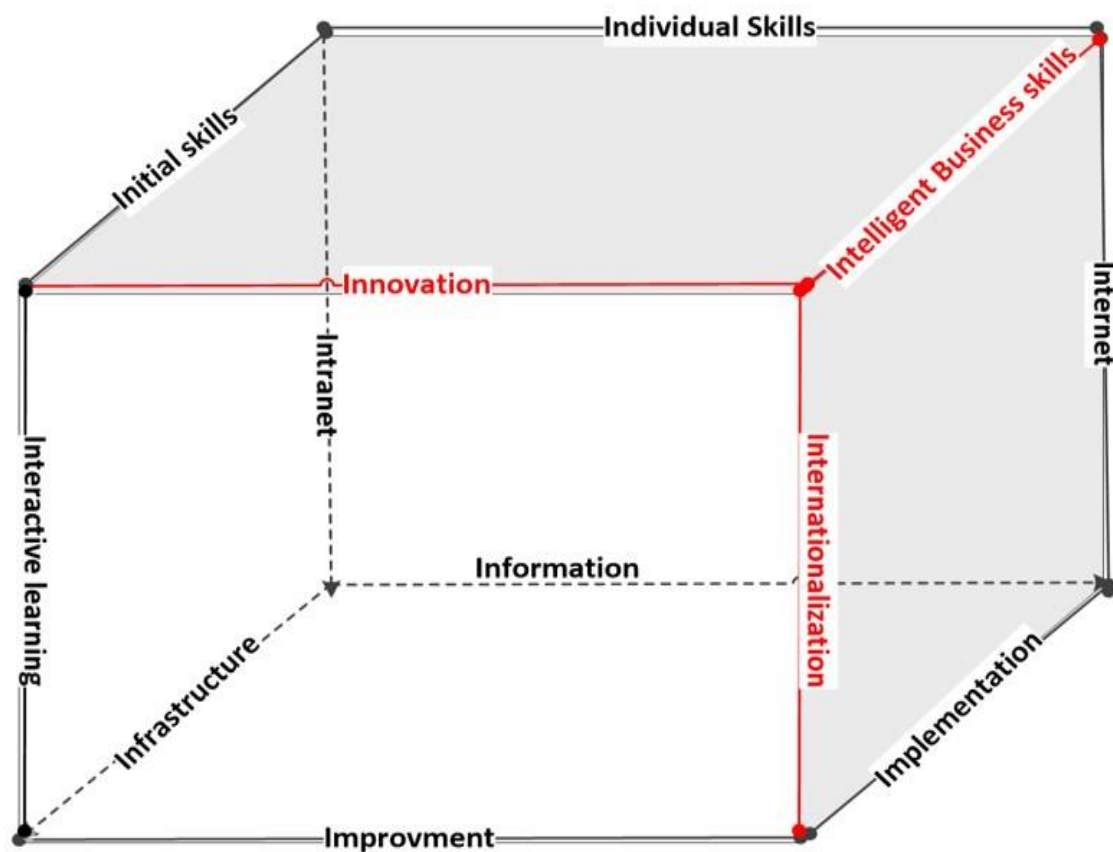
Figure 5.5: Final view of I-Cube (Kenan, 2015)

Kenan (2015) designed an I-Cube model for the development of teaching and learning activities in modern HE, based on the correlations between three categories of stakeholders at any HEI: lecturers, technicians and students.

This I-Cube model could be used for designing and implementing teaching and learning activities which involve both face-to-face sessions and e-learning packages (included in the proposed ICT framework).

A. Derived correlation between Lecturers and Technicians (LT surface)

This correlation came from many views and results derived from different analytical methods, and by considering four factors which are represented in the relationship (Kenan, 2015). These four factors for consideration comprise information, the Internet, the intranet and individual skills; these are represented by the LT surface edges when drawn in the form of a square as shown in the following figure:
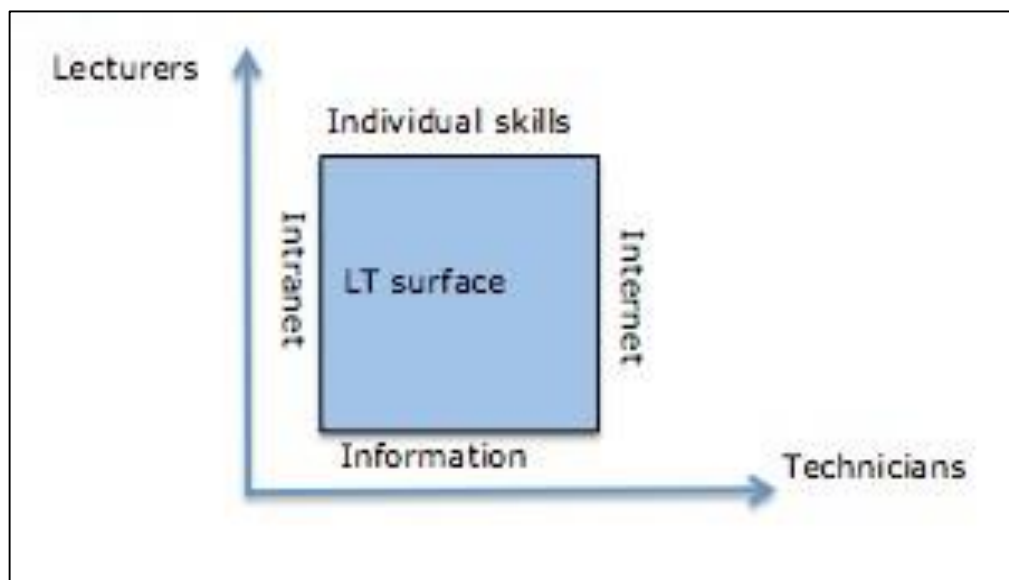
Figure 5.6: Relationship between lecturers and technicians (Kenan, 2015)

1.   Information: this includes both general information and essential details relating to course materials, curriculum content, personal data, etc.. AZU should develop a new style of course materials, including the development of reusable learning objects.

2.   The Internet: this includes all technological resources from the Wide World Web (WWW) which can be used for teaching and learning purposes. From the answers provided by academics from the EE and EL departments in AZU, it was obvious there was a need for better communication and collaboration between lecturers and technicians in order to increase the influence of Internet usage on their academic efficiency and level of satisfaction.

3.   The intranet: this is the edge that can really test the correlation between lecturers and technicians via the VLE tools that are available in AZU. These tools should be maintained and

updated on a regular basis so that they are continuously aligned with technological developments and pedagogical requirements.

4.   Individual skills: AZU should provide training courses for lecturers and technicians, enabling them to use modern technology for creating course materials and to use software packages in lab sessions. The training courses should also aim to improve presentation skills, and the use of advanced teaching tools (animation, simulation, multimedia, etc.) will increase the personal satisfaction of both lecturers and technicians. The technicians will benefit from receiving clear guidelines and the lecturers will gain more authority in the preparation of lab classes and use of technology.

B. Derived correlation between Lecturers and Students (LS surface)

This is the second surface of the I-Cube and demonstrates the common element or shared edge between the LT surface and the LS surface, which is the **INTRANET.**

. The intranet: this edge shows that the VLE tools are important for lecturers, technicians and students when they are doing their work. AZU should provide training courses for students to enable them to use software packages, specific applications, Internet resources and other VLE tools. Figure 6.6 shows the two surfaces adjacent to the students, lecturers and technicians axes, along with the other three edges of the LS surface.

2.   Initial skills: these are skills required for communication between lecturers and their students in HEIs in general, such as replying to emails, preparing lectures in the VLE, online assessments, designing Power Point slides, etc. These skills should be subject to rules in AZU, whereby, depending on the initial training level, they are subject to periodic evaluation or benchmark assessment by specialists.
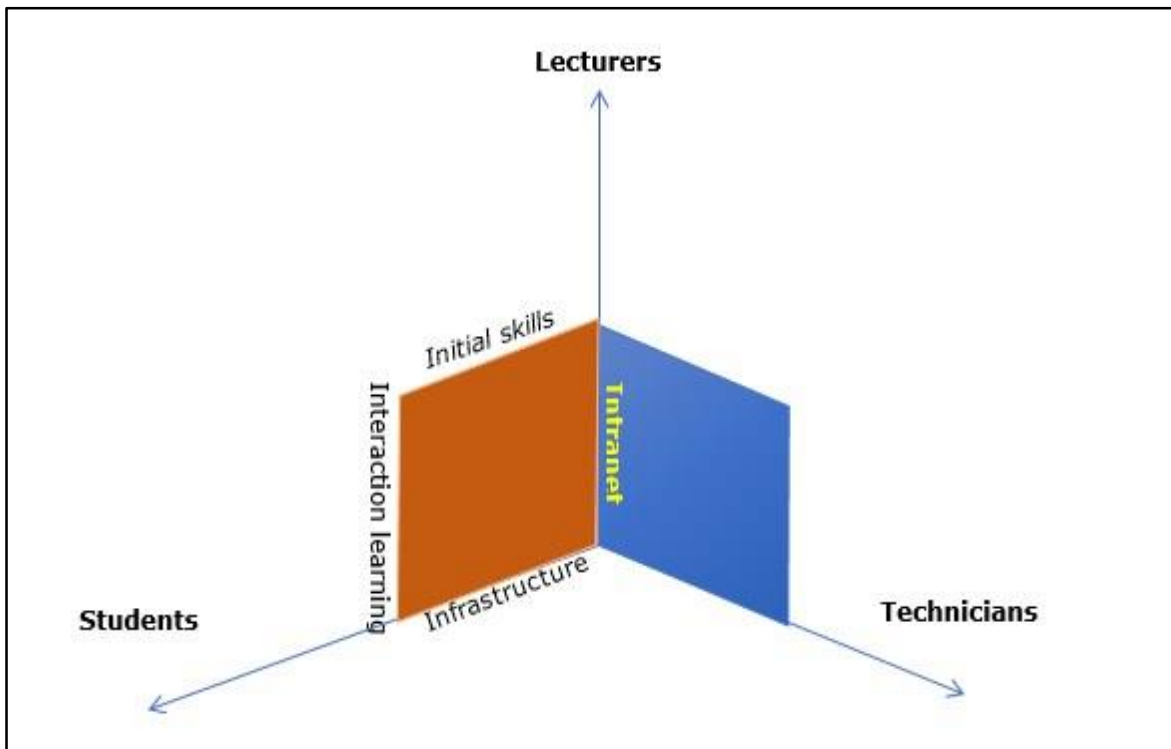
Figure 5.7: Derived correlation between lecturers and students

3.   Interactive learning: this edge is particularly relevant from a pedagogical point of view. An effective correlation between intranet resources and infrastructure should increase the efficiency of interaction between students, their colleagues and lecturers. The first point in this interactive process is the curriculum design, which has to consider several factors such as curriculum models, learning theories, institutional framework, level of achievement, assessment strategies, etc. (ASCD, 2012). The details for this curriculum design model are included in **Chapter3/Figure 3.2.**

4.   Infrastructure: this includes all required equipment, including tools, labs, software packages, PCs, e-library and room equipment such as the Smart board, wireless Internet, Internet cables, etc. AZU should refer to these tools in an updated strategic plan.

C. Derived correlation between Students and Technicians (ST surface):

This relationship is complementary to the two previous relationships and is achieved and formed from conjunction with both the LS surface and the LT surface. Of the four edges of the ST surface, there are two edges which adjoin other surfaces; these are the **INFRASTRUCTURE** edge, which is shared with the LS surface, and the **INFORMATION** edge, which is shared with LT surface, as shown in Figure 5.7. A consideration of the factors

represented by the four edges enables an understanding of the relationships that can lead to success in the development of ICT in general.
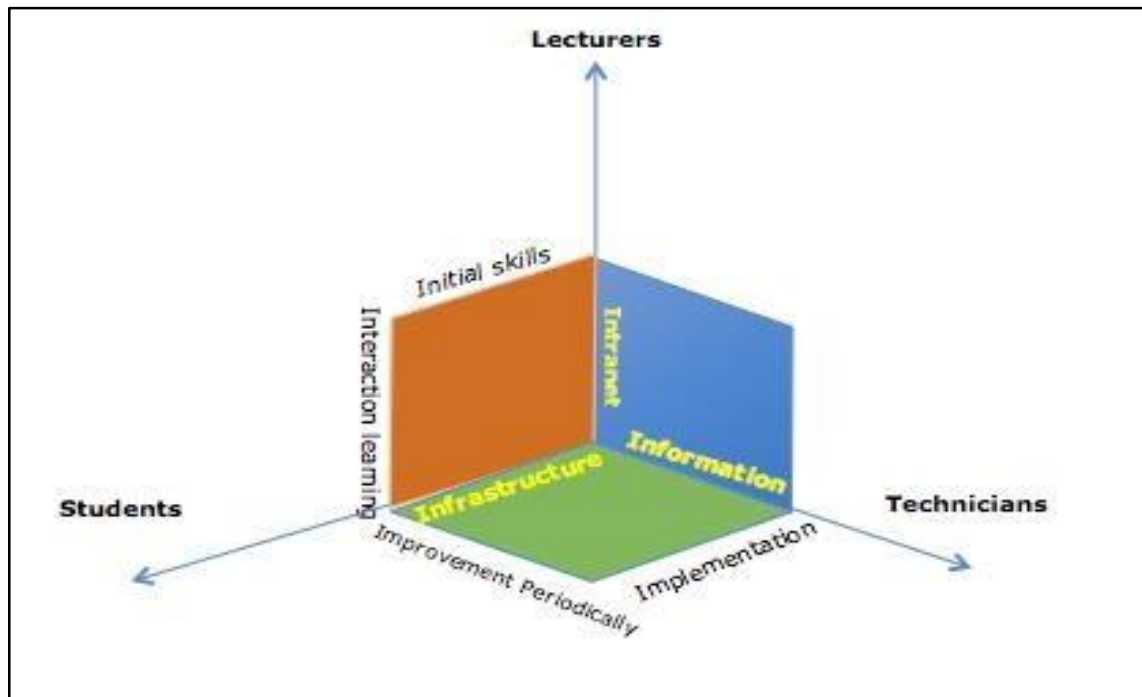
Figure 5.8: Derived correlation between lecturers and students

1.   Information: whereas the information edge previously related to the preparation of course materials by lecturers and the provision of technical support by technicians, it represents here the benefits to students of having access to curriculum details, course details, training courses, registration rules, the 'help' system, etc.

2.   Implementation of ICT: this should be considered in light of an investigation into the performance and utilisation of software related to Blackboard or VLE within various faculties within AZU. In this context, the university could examine technicians' experience in teamwork and initial skills, as well as management strategy according to the policies of the school or institute.

3.   Periodic improvement: from daily dealings with students, emails, assessments, exams, help desk services, cooperation with technicians and continuous transactions between them, the ST surface will require a cycle of maintenance to improve performance. These improvements will not come about without response notes between students and technicians regarding issues where there is a need for the technicians to act as primary support. Also, AZU could test the ICT performance level in each school or department.

4.   Infrastructure: this edge is a joint side for the three relationships; it includes all the required equipment, including tools, labs, software packages, PCs, e-library and the room

equipment that should be available in each department or school depending on the usage of ICT.

Kenan (2015) combined the three relationships represented by the LT, LS and TS surfaces into one shape in the form of a cube, by adding three further surfaces and three edges. Each edge represents an important element in the success of an e-learning strategy, and these edges also apply to the examination of ICT performance.

The three previous relationships were between the main groups of stakeholders in HEIs, the idea being that each surface would be not complete without the others. The three additional surfaces, together with the function of their adjoining edges, are derived from many theories related to innovation and internationalisation, both of which have a great effect on the development of the teaching and learning process, as well as the intelligent business skills that should be included in the new strategy for HE systems. These three elements, intelligent business skills, internationalisation and innovation, are represented by the three additional squares and their edges (summarised below) to create the I-cube. Figure 5.8 illustrates the addition of the three new surfaces and their relationships with the new edges to make the Icube.

Innovation: this edge represents the suitable policies that should be applied by the administration team to the technicians' work and the lecturers' activities, which will then be reflected in students' performance. This innovation should come about as a result of evaluation of previous strategic plans implemented in the school or institute by the decision makers.
The process or procedure of innovation in Libya currently involves too many rules and conditions to be successful. The innovation of Internet usage is moving at a fast pace, especially with regard to the use of new tools which encourage peer support, learning and assessment.

Innovation involves the use of innovative technologies and models to support e-learning, and requires an exploration of the impact of innovative tools and applications on learning and teaching. Greater flexibility is required in dealing with pedagogical and technological issues so that innovative technologies can be used effectively to support learning, especially the use of wireless and mobile technologies such as games and simulation software, voting devices in classrooms, multimedia, 3G phones and stronger wireless networks (Elzawi et al., 2012).
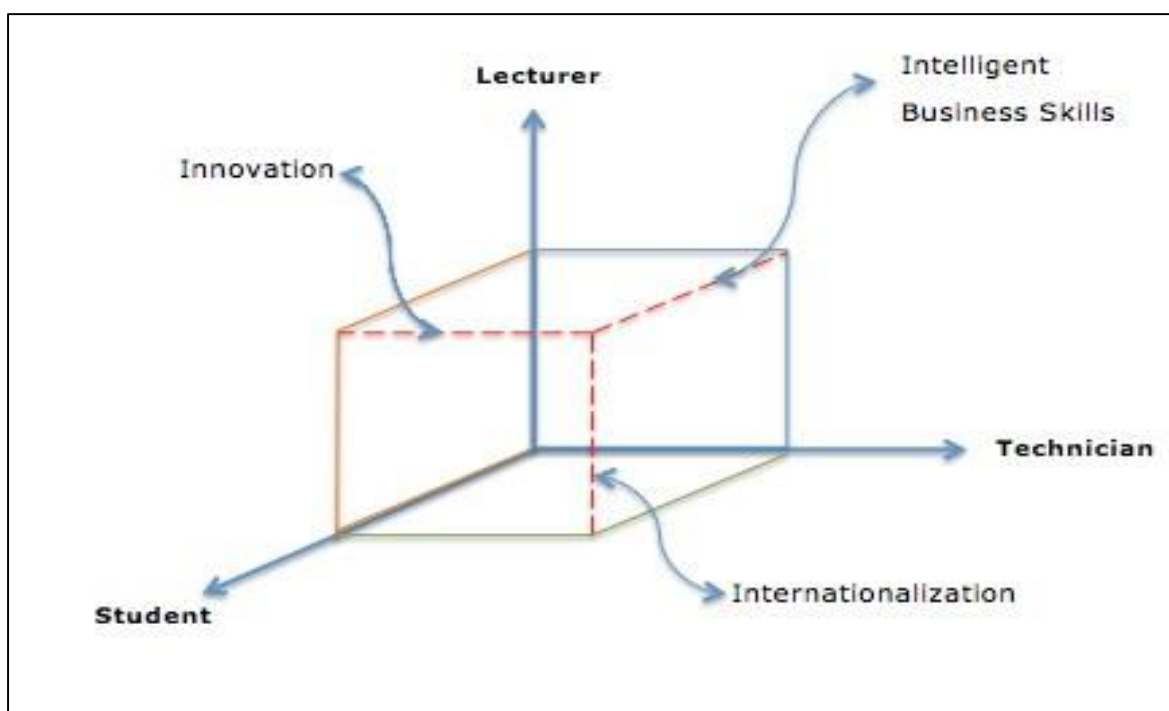
Figure 5.9: Proposed I-Cube model for the development of teaching and learning activities (Kenan, 2015)

Intelligent business skills: these are essential skills that need to come primarily from the key members of the HE team, rather than from lecturers, students or technicians. They are required by the decision makers and the team or government responsible for HE. This team should have good business, education and strategic experience to acquire the required support for the school or institution.

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

- Consultation regarding the setup, preparation, design and manner of delivery of courses

(See sections 3.4, ASSURE model and 3.5, Curriculum design model (ASCD, 2012));

- Revision of courses;

- Development of courses supported by appropriate programs;

- Design of activities which recognise and include new methods, in order to keep pace with rapid global developments in HE.

In the case of LHEIs, the advantages of blended learning should be recognised as soon as possible. A competitive environment should be created with regard to innovation, supported by annual assessment for all stakeholder teams; this would make teams responsible for making their own rapid steps forward (ISP, 2015).

Jensen and Folley (2011) report on outcomes at the University of Huddersfield after the 'Enterprise and Entrepreneurship' team embedded an entrepreneurial outlook across research, teaching and collaboration to drive forward world-leading research with a societal, economic and cultural impact. This work has been recognised as creating an environment that encourages research and collaboration. For example, the International Institute of Accelerator Applications, based at the university, is the first UK institute dedicated to this key area of research (Elzawi et al., 2013b)

In the case of Libya, the researcher believes that if the aforementioned intelligent business skills are successful, LHEIs will become the greatest investments in the country, bringing many benefits for a variety of reasons. For example, the strategic position of Libya in Africa (see Figure 5.10 below) should enable it to attract African students and, instead of the disadvantages of illegal immigration, should allow it to enjoy the advantages of human investment. Furthermore, Libya is a member of the 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. The MENA Programme runs a variety of discussion groups, round table meetings, workshops and public events which seek to inform and broaden current debates about the region and international policy; it also produces a range of publicly available reports to aid the development of infrastructure (MENA Programme, 2012).

Figure 5.10: The position of Libya

A successful and innovative Libyan higher education sector should also be able to attract migratory Libyan minds. They may need to start from scratch, but they should be able to start with a strong base. The development of a country is measured by its education system (Rhema, 2013).

Internationalisation: this is another important element in the I-cube model for HEIs in general to acquire international students and ensure success in e-learning. This could be achieved via international agreement on a model curriculum specification for all courses in order to support the education process in Libyan HE at all stages and in all LHEIs. Particularly if they can be successful in establishing e-learning. This could be achieved via international agreement on a model curriculum specification for all courses, which would also support the education process in Libyan HE at all stages and in all LHEIs (Kenan, 2017).

5.2.3. Implementation stage

5.2.3.1. Implementation stage - organising specialist training courses on technology and pedagogy

Over the last three decades, many models have been used to explain the processes involved in the adoption and use of ICT in education. Based on some of these models and frameworks, a new framework for increasing the effectiveness of ICT and associated instruments was developed for use with AZU teachers in order to measure and support change in ICT usage. This framework can be used to support, describe and promote good practice in the use of ICT in learning and teaching in schools, and is multifaceted and flexible enough to be used by individuals, groups, schools or educational organizations. The aims and purposes of the framework were to describe quality pedagogy in the use of ICT to effectively support student learning in schools; to assist teachers in planning to integrate ICT into learning environments; to describe progress by teachers as they move towards the integration of ICT into quality pedagogy; to assist teachers in the development of their own practice in the use of ICT to support student learning; and to provide a tool for teacher dialogue regarding ICT integration with good pedagogy and provide topics or questions that describe concerns teachers may have. This framework was based on a review of literature on the progression of teachers in their integration of ICT into learning and teaching processes.

It was positioned within a broader framework for the implementation of ICT in HEIs to connect students, learning environments, HEIs and system organisations. This section describes the process required in the provision of training courses in technology, taken from a twodimensional model for measuring individual teachers' progression in ICT integration (MeiChuen Lin et al., 2012). Training should be provided at the following levels:

- For mundane use of popular ICT application packages when calculating grades, collecting homework, communicating with parents or posting announcements, etc.
- For integrating off-the-shelf educational software in classroom teaching.
- For using Web applications fluently to find and organise useful resources (available wikis for teaching and learning, email, online chatting, blogging and other social networking tools, etc.) and dealing with common Internet problems such as virus attacks and phishing attempts.
- For creating multimedia teaching materials by digitising them through word processing, creating PowerPoint presentations which contain text, graphics, animation and sound, and using Excel spreadsheets and other software included in Microsoft Office.

- For customising multimedia resources by editing readily available or self-made images, audio and video clips, as well as animations using animation software or screen capture software (i.e. Camtasia, Powercam) to produce online learning tutorials.
- For producing simple instructional applications such as creating a class website that posts announcements and presents students' responses, and which includes exercises that enable students to study materials at their own pace.
- For implementing sophisticated instructional systems; this requires much more advanced computer skills. For example, the class website created by a teacher may include a discussion forum to encourage teacher-student and student-student interactions via the application of a programming interface such as Moodle for specific new functionality.

The process for training courses in pedagogy, again taken from the two-dimensional model, should be structured as follows:

Level A – direct teaching – relates to traditional teaching methodology (teacher-directed). This relies primarily on lectures, note-taking and chapter reviews, so the lecturer delivers knowledge, provides modelling and demonstrations by one-way communication with students.

Level B - cognitively active learning - highlights understanding and application rather than repetition. Students are encouraged to actively extract information from items by themselves with the assistance of visual aids or audio clips (Lin et al., 2012). The lecturer at this level is no longer a one-way provider of information but a facilitator for students' information processing, who provides adaptive feedback to students to help them achieve a deeper understanding of content.

Level C - constructive learning - constructs knowledge on the basis of interaction with students' environment. It involves establishing a learning environment to support students' thinking about new knowledge items (Alexa, 2015). The teacher's role is to give suggestions for improvement and help students towards success, but students themselves are responsible for devising and implementing problem-solving strategies.

Level D - social learning - focuses on addressing collaborative and social dimensions of learning. A collaborative, social-constructive learning environment is established to support students in learning new information and behaviours from one another. Students are also encouraged to interact with context, peers or communities to socially construct knowledge (Alexa, 2015). The collaboration between undergraduate students and post-graduate students could generate innovative solutions and enable the development of their employability skills through collaboration in final year group projects (Pislaru, 2014). Activities such as student

debates held in person or in an online environment, conversation with experts or team-based projects are often assigned.

Pedagogical training courses should aim to enable educators to move from direct teaching (traditional approach) to cognitive active learning, constructive learning or social learning including peer-assessment and peer-review.

5.2.3.2. Implementation stage – using ASSURE instructional design model to formulate pedagogical activities for technology-led teaching and learning purposes

The ASSURE model demonstrates the main steps required for effective implementation of Internet applications into any course.
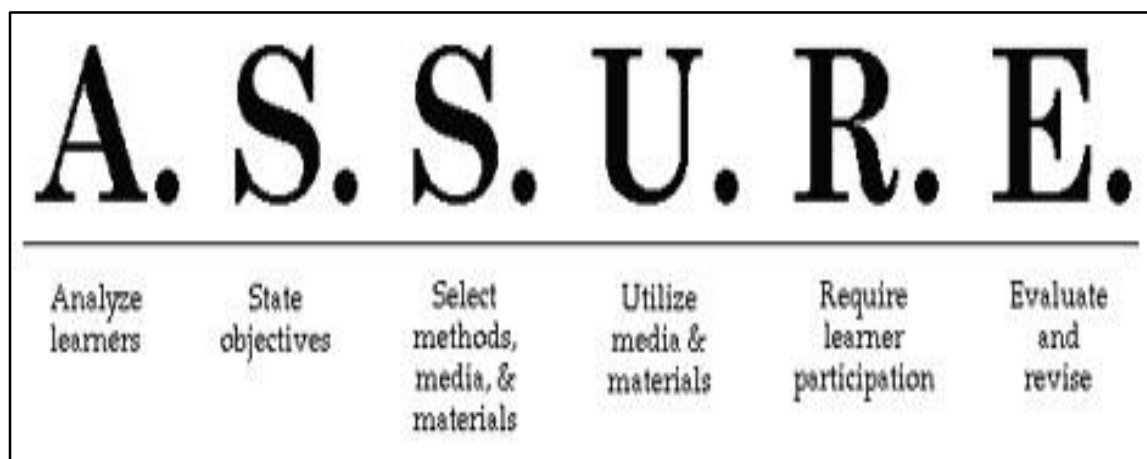
Figure   5.11 : Application of the ASSURE model

This model was developed to create a self-study product using pre-digital technology (audio, paper-based, etc.). However, the model can be used in the development of software as it is focused on the pervasive design issues: user analysis and design, content, structure, activities, evaluation and feedback. In any software or programming course in the DEE, the hands-on practical work is important. Students attend lab sessions in teams implementing and testing programs. The researcher's aim is to use the Internet in general courses, in order to help students, organise information and visualise the internal relations between components of the system. This can be achieved through cooperative educational activities, based on small electronic discussion groups.

A plan for any course utilising the Internet or intranet in the two departments is described below. The most important characteristic of such a course is that lecturer can institute it before or after the lesson, without the need for instructional design specialists. The lesson plan

focuses on instructing students how to choose and use digital tools. Students can then determine the interests of the investigation and monitor progress towards completion of their work. The following lesson plan, which can be applied to any course, taking into account the differences between the DEE and DEL, follows the ASSURE model and ensures that the learning objectives use technology as a tool and not as a learning objective.

A. Analyse learners
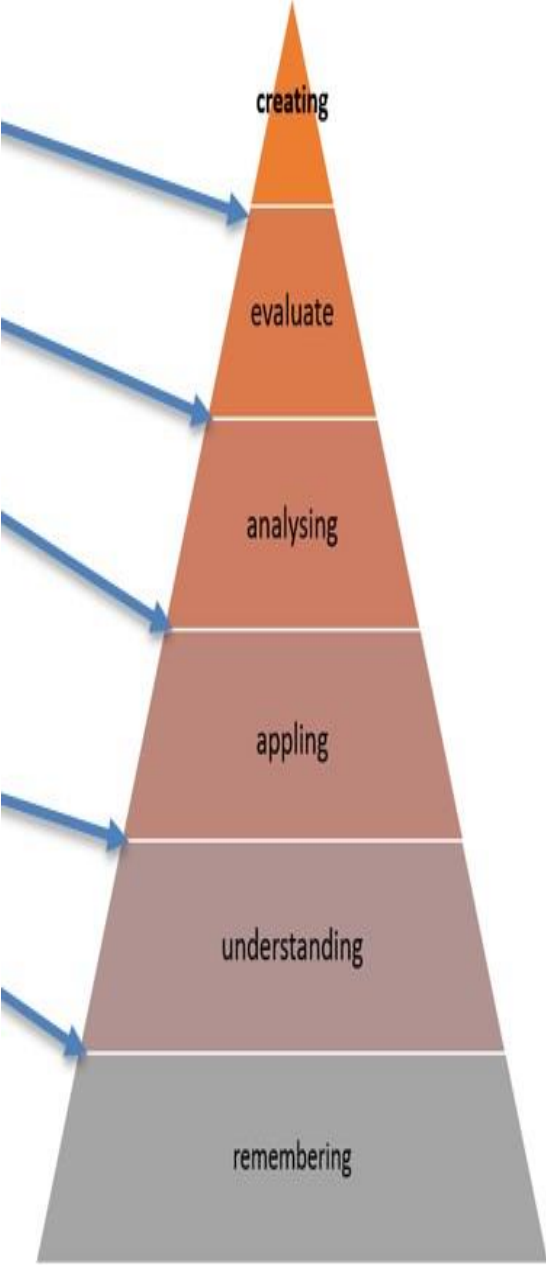
The ASSURE model should first be used to analyse the students' personalities, also taking into account the academic year, the number of students, the time constraints of the course and the hours of lessons including tutorial times. All the students would be enrolled on a course in either the DEL or DEE. To begin with, most of the students would not have had practical experience or understanding of theoretical subjects that are essential to the success of lab sessions. However, the students should have undertaken a previous introductory session during their last academic year (if required by their course), so by this time the students should have a clear understanding of the demands of their classes and be familiar with the classroom technology, which will have given them various basic skills in using Internet tools and other related technologies. The findings of this research have already shown that Libyan students have positive attitudes towards Internet application, and that Internet application resources support traditional learning methods. This was determined from the results of the questionnaire (in Appendix A) based on the respondents' gender, educational level and age. The findings also showed that Internet applications are an effective teaching method to motivate students to learn and encourage them to continue in further education. Thus, the Internet application resources and related technologies play an important role in improving and developing teaching methods, as well as in giving students wider opportunities to learn.

S. State Objectives

These depend on the lecturer, who must ensure that students know the educational goals. The lecturer should identify the needs of the students; this includes determining how to utilise educational multimedia to advance the overall cognitive and emotional growth of the learners, and estimating any shortcomings in the technology. At this stage, Bloom's taxonomy theory can be considered, which divides learning into six stages (remembering, understanding, applying, analysing, evaluating and creating).

"Currently, any person or organization that wants to employ learning objects in their instructional design is required to create their Bloom taxonomy of learning objects" (Wiley, 2013, p. 11).

Table 5.4: Bloom's taxonomy pyramid within the design

Actions related to the implementation of ICT	Bloom's taxonomy
Creating - this stage relates especially to students who have achieved a high level; for example, in the DEE they should be able to build a program to solve a specific problem, or implement activities involving several programming languages.	
Evaluating – the learners should be capable of evaluating the course material or tutorial work for conformity to standards. They should know suitable quantitative and qualitative measures of application, and should be talented enough to practice those measures.	creating / evaluate / analysing / appling / understanding / remembering
Analysing – the students should be able to solve problems using the basic applications (for example, the DEE students should know how to use tools to solve command problems via many software packages, whilst DEL students should able to use translation tools or similar) that are related to the course.	
Applying – the students should be able to apply appropriate fundamental principles for various activities and collect data. They should be able to use plans, test plans, project plans and use related flow charts, etc.	
Understanding - the students should be able to understand, explain and describe the course materials. The nature of the DEE and DEL courses is different here.	
Remembering – for any course, whether in the DEE or DEL, students should be able to define the fundamental theories and practical uses; they should know the processes and activities for exercises.	

S. Select appropriate method, media and materials

The lecturer should select suitable methods to deliver the necessary information, such as presentation slides, moving pictures or animation (this stage relates to the second aim of qualitative analysis of the research data). This helps to engage students with the subject

matter. For example, the lecturer (from either the DEE or DEL) may organize the students into groups. Other students might work individually, using the Internet and various multimedia resources. The lecturer and students should use a combination of the following materials as appropriate: hand-outs given to students to help them focus more on their research for specific functions and commands and a computer or laptop that provides individual use of online tutorials and videos for solving problems. A combination of any of these tools *may be* considered a multimedia approach. The students will then use the multimedia tools to discuss the issues and ideas as a group. The digital tools will allow the incorporation of sound, moving pictures and animation into lessons, which will give students a more active role in the learning environment (Wishart, et al., 2012). They can watch practices in action, see small things up close, and use the keyboard or mouse to navigate interactive materials and images. The use of multimedia helps to transfer information effectively and quickly to all students, and can keep students interested. The lecturer can also blend video, audio, text, images and multimedia into a single online environment available to students both in school and at home (Kenan et al., 2014).

U. Utilise media, materials and methods

It is very important to review and inspect each material before providing it to students; this stage can be used to pilot-test the lesson materials and review them. The students will be aware that the lecturer needs to gather and prepare materials for the tests, worksheets and handouts distributed. The teacher should show students a visual display of the basic materials of the course in tutorial, and students can write notes during the explanation (Archibald et al., 2015). With regard to preparing the environment, the lesson may be in two different places, in the classroom and in a lab, so both places will need to be previously set up to encourage student participation and provide students with access to computers connected to the Internet. The students can then use the computer as a means of designing research programs, printing reports and other activities, and can use the lab to gain additional practice. The computers can also facilitate team training and workshops in the computer lab. Thus, the DEE and DEL students can gain practical experience and learn teamwork through a set of software programs.

R. Require learner participation

According to the singular learning strategy, it is vital to integrate interactive activities into the learning process. Whether these activities are individual or collective, they contribute to meaningful learning and ensure the achievement of educational goals among a diverse class

(Chareen, 2016). Not all students will have reached a high level, but by participating in interactive activities, they can receive help to reinforce lessons learned in the classroom and get results and answers.

E. Evaluate and revise

After each lesson, students must answer questions to enable evaluation of the objectives in terms of new skills and student performance. These questions should be answered at the end of the lesson, and through review of these results, the lecturer receives feedback on student performance and the acquisition of various skills.

5.2.4. Continuous evaluation and reflection

5.2.4.1. Continuous evaluation and reflection – evaluation of improved ICT integrated system

AZU must match and compete with the standards of other countries' universities' strategies. This goal is part of a move towards a knowledgeable society in which ICT is considered a prerequisite. The aim of making decisions about technology issues before the implementation of practical systems is to reduce the investment of time, effort and money, and much benefit could be gained from combining active learning methods with a suitable policy (Elzawi, et al., 2013b). Both active learning and e-learning encourage students to use numerous sources of knowledge, and persuade them to integrate and employ information efficiently.

A. Prototype

In this section, the researcher describes and analyses a curricular experiment in the use of ICTs at AZU. Firstly, in the context of an ICT course in higher education, it was important to deal with the conception and implementation stages of a model that would support the development of work by groups making use of the Internet. It was also essential to determine the methodology of the work adopted while exploring a specific website (or related link), and to analyse the main implications of its use in school practice. The varying degrees of training which the various lecturers had created a flexible platform for providing support for learning activities. They could be presented with the students' interface and discuss some of the underlying options and then, in the final evaluation, reflect upon the importance of promoting the integration of ICT in education and training.

According to the new framework for ICT integration, students should be able to:

- Use technology as a tool to research, organize, evaluate and communicate information.
- Use digital technologies (computers, IPad, websites), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to successfully function in a sphere of knowledge.
- Apply a fundamental understanding of issues surrounding the access and use of information technologies.
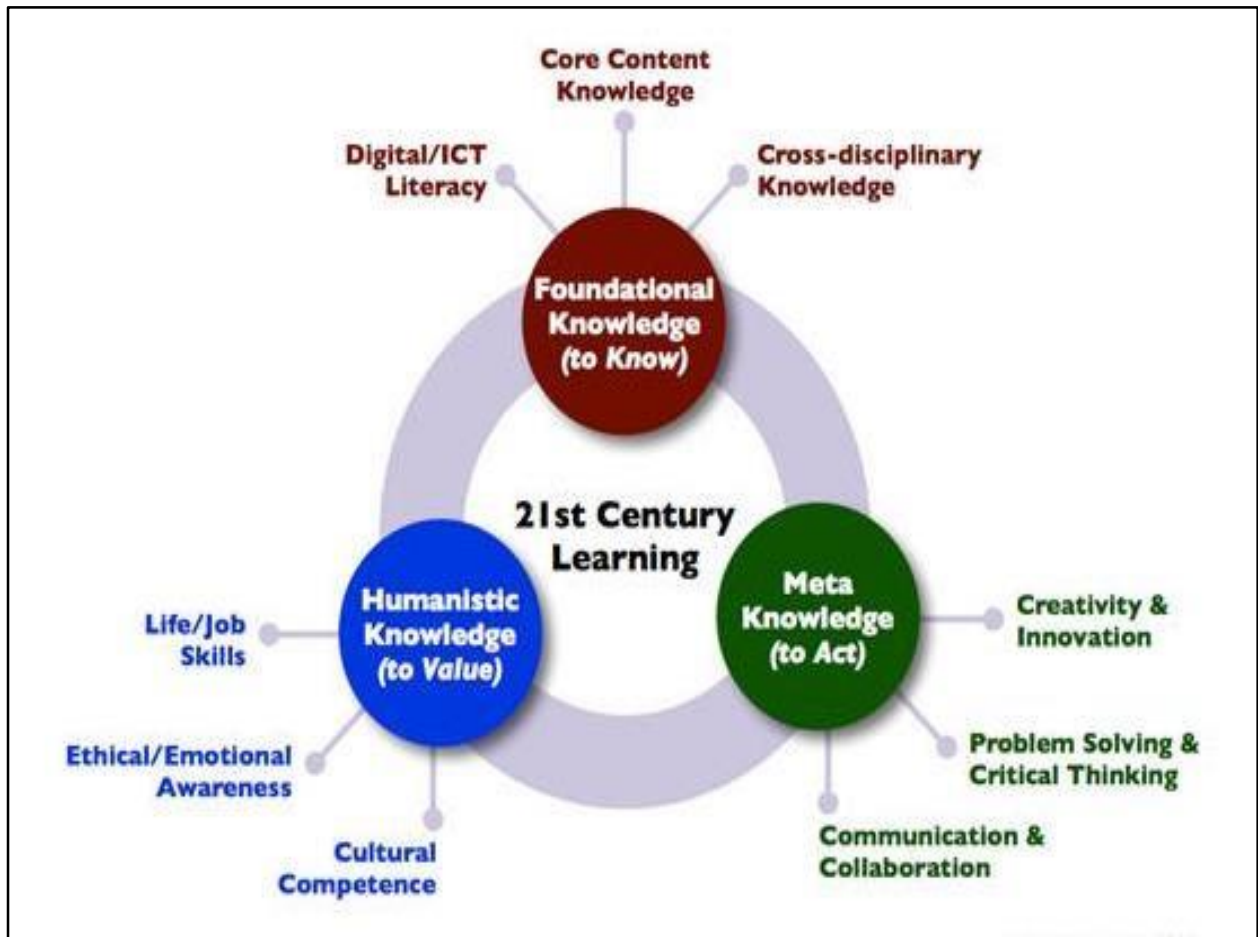
Figure 5 .11: ICT prototype (Kereluik, et al., 2013)

Kereluik, et al. (2013) propose that the digital and ICT prototype is just one of nine subcategories within three categories of knowledge necessary for the 21st century: foundational, humanistic and meta. Foundational knowledge includes digital and ICT literacy, core content knowledge and cross-disciplinary knowledge. Humanistic knowledge includes job and life skills, ethical and emotional awareness, and cultural competence. Meta knowledge focuses on creativity and innovation, problem solving and critical thinking, and communication and collaboration. Lecturers need to be aware of the effect of technology on the acquisition of each type of knowledge.

B. Expert evaluation and changes due to recommendations of experts

The lecturers would have the ability to effectively and thoughtfully evaluate and construct information using a range of digital technologies, and thus to function fluently in a digital world. An important part of this is the ability to effectively seek out, organize and process information. This form of literacy also includes a component of responsible use of technology, an important moral and ethical consideration beyond understanding basic information and communication technology systems.

In the area of Information and Communication Technologies in Education (ICTE), a subject in the HE course, students should be asked to undertake collaborative work on the role and implications of information and communication technologies both in general and in education. The purpose of this is to ensure both reflection and a sense of cooperation in research, aspects which should be valued in an academic culture and, especially, in an HE course. However, a few other specific features of higher education should be considered which may restrict the applicability of the collaborative work methodology, making it difficult to proceed with the collaborative sense of learning that we would wish to implement. These features include the extent of the syllabus, the disparity in geographic origins of the students, diversity in the attendance system and the division of pupils into various classes (Chai et al., 2010 & 2013b).

Despite the low level of satisfaction with the available technological infrastructure, the majority of lecturers in the case studies expressed an interest in studying and providing courses that use ICT tools in the future. The main reasons for ICT integration which they identified were to improve communication, to facilitate student learning and to enable incorporation of new teaching methods.

C. User evaluation of the proposed ICT framework

Evaluation of the pilot version of the course integrating ICT tools into teaching in the DEE and DEL at AZU would need to be done by experts (lecturers) after receiving comments, questions and any requirements to change some of the content in order to make it more accessible and easier to use (Crook et al., 2015). Expert (heuristic) evaluation should be based on best practices, years of experience observing students and knowledge of educational requirements (Blackley & Howell, 2015). The lecturers would need to change the prototype of the course integrated with ICT tools in accordance with experts' comments, and then ask other lecturers from the same department at AZU to provide access to their students.

The Neilsen Norman Group (2013) indicate that the usability of a website is a characteristic that describes the ease with which users can use the website. It also relates to the processes that facilitate easy use of interfaces at the designing stage. This is dependent on five principles

of usability, which are learnability, efficiency, memorability, errors and satisfaction, as shown in the figure below.
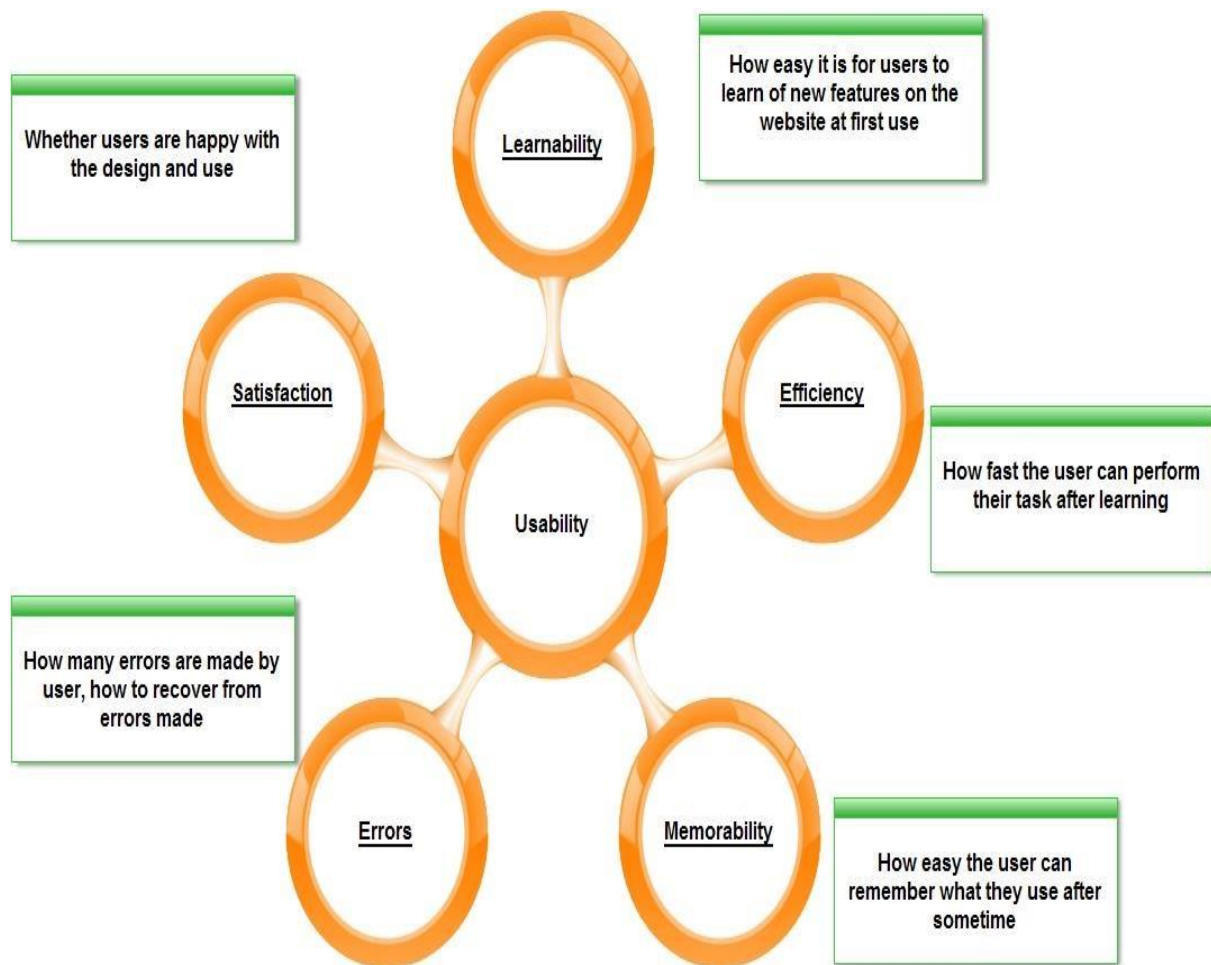
Figure 5.12: Usability (Neilsen Norman Group, 2013)

A test of usability, or evaluation of usage, can come through responses to questionnaire questions, which in this case would be answered by students as general users. The system would 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 further from the system. This also checks for 'user-friendliness'. Video recording of user sessions and other techniques can also be used, depending on individual end-users or customers (Janssen, 2013).

The requirement from this evaluation would be to check usability in the DEE, where professionals and students have a stronger technical foundation, and the DEL, where they have more generalist skills. The five principles of usability, i.e., learnability, efficiency, memorability, errors and satisfaction would be tested, but team working, communication, commercial and global awareness would also be required in order to be successful. For this reason, the researcher suggested that the questions should relate to any ICT course or any

lab course by considering a five-principle evaluation in the form of a simple questionnaire for the two departments (DEE & DEL); an example is shown in Table 6.5.

Table 5.5: Selection of questions from the evaluation questionnaire

No.	Usability principles	How you find the ICT course?	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
1	Efficiency	Delivers updated information about modern technology with good quality					
2	Memorability	Has reliable information; helps you remember the original lesson					
3	Learnability	Adds value to engineering education courses					
4	Satisfaction	Can be easily accessed online					
5	Errors	Contains some design errors					

5.2.4.2. Continuous evaluation and reflection stage - evaluation of users' performance (lecturers, students)

Evaluation of the quality of faculty research is not easy; it is also not easy to evaluate the quality of faculty teaching. However, there are multiple methods of evaluation that suit those purposes of evaluation. These evaluation systems are reliable, valid and fair. The process of discussing and crafting evaluation systems focuses on the practice of good teaching and helps to create a culture in which teaching is highly valued.

A. Teaching evaluation

There are multiple methods and principles of teaching evaluation involving multiple sources of data, but the faculty's departmental and school responsibility is to ensure that the evaluation system adopted is credible and acceptable, and faculty members must have a strong hand in its development (Biagi & Loi, 2013). They should determine their criteria for effective teaching. Departments and schools in AZU should therefore take responsibility for developing their own evaluation methods and evaluation criteria. Teaching evaluation systems can be flexible to accommodate diversity in instructional methods, such as lectures, discussions, labs, case

studies, small group interaction, field work, etc.). To promote compatibility within the university, standards should be reviewed, understood and accepted by all groups involved in the promotion and tenure review process (Freeman et al., 2014). In addition, effective teaching evaluation must be individualised, so a plan sensitive to individual variation should be developed (Zhang & Henderson, 2015). Assessment of the quality of teaching also includes activities broader than mere classroom instruction, so evaluation of teaching must assess more than classroom performance (Bian et al., 2016). While departments and schools may identify additional items, among the teaching activities that may be assessed are the following:

- Quality, amount and level of classroom instruction;

- Development of curricula, new courses and classroom materials;

- Supervision and mentoring of graduate students, including chairing of dissertations;

- Service on graduate examination and dissertation committees;

- One-on-one consultation with students, including supervision of independent study and reading courses;

- Supervision of teaching assistants on undergraduate courses;

- Conduct and supervision of laboratory instruction;

- Supervision of undergraduate and graduate research;

- Advising students in the major;

- Supervision of field work; and

- Supervision of practical experiences.

Most evaluation studies of teacher professional development focus only on learning satisfaction due to a short research period and easy data collection. Kirkpatrick's model of evaluation includes four levels (see Figure 5.13): the reaction level refers to trainees' perception of training; the learning level focuses on measurement of the learning outcome in terms of knowledge and skills taught in the training programme; the behavioural and results level concerns the effects of training on work performance; and the results level considers productivity gains of the whole organization. As can be seen, the model is rich, finely turned, multilevel, and considers not only immediate but also long-term effects (Praslova, 2010). Since its inception in 1959, the model has been the most reviewed and applied guide to assessing workplace training (Arthur et al., 2003; Roos et al., 2014). Because systematic evaluation frameworks in educational settings are relatively limited and immature in comparison with those in corporate and industrial contexts, scholars suggest borrowing from

workplace training to develop a model that can facilitate effective teacher performance development (Steinert et al., 2006).
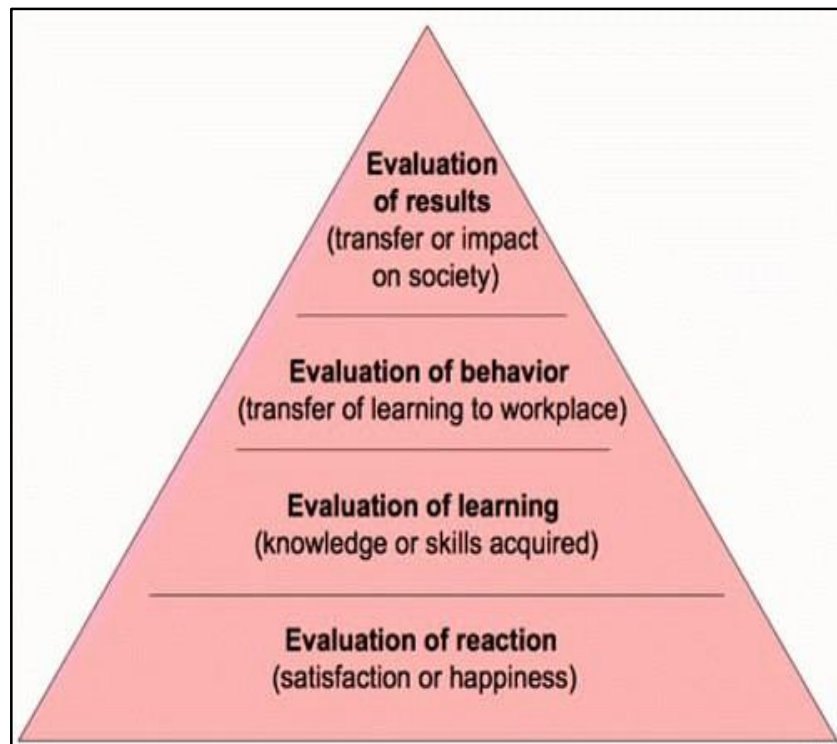
Figure 5.13: Kirkpatrick's evaluation model (Bian, et al., 2016)

Whilst other research has confirmed that senior preschool teachers might show a certain degree of resistance toward ICT-integrated teaching environments (Bian, et al., 2016; Zhang & Henderson, 2015), studies have also found that teachers with HE qualifications tend to have more knowledge of ICT use and integration in their teaching environment (Rienties et al., 2013)

However, in most cases, teachers are confident about their intention to use ICT in teaching yet do not make differences in real practice; thus, they do not achieve long-term impacts on student learning or overall organisational change in teaching and learning, as illustrated in Figure 5.14 (Lawless & Pellegrino, 2007; Steinert et al., 2006; Stes, Maeyera, Gijbelsa, & Petegem, 2013). This is why impact levels have to be evaluated in terms of both behaviour and results in Kirkpatrick's model.
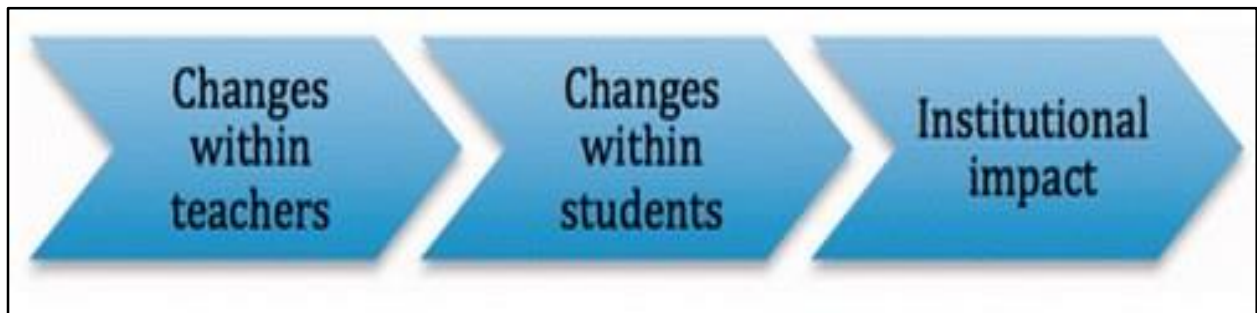
Figure 5.14: Teacher professional development impacts (Steinert et al., 2006)

B. Performance of students and formative assessments

Teaching faculties are interested in factors that predict academic success and facilitate learning. The normal testing scores, grade point average and language familiarity are widely recognized predictors of subsequent academic performance. It is also appreciated that student achievement improves when faculty members provide post-assessment feedback. Therefore, it has become common for faculties to supplement traditional summative exams with formative quizzes (Dunlosky et al., 2013). Faculty members also use quizzes to predict exam scores, and Web-based self-assessments have been used to improve knowledge and test performance. While summative exams evaluate student knowledge or task performance at the end of instructional segments, formative assessments provide students with feedback about how they are doing along the way. Students must view formative assessments as relatively 'low-stake' for them to be effective. Therefore, formative assessments are usually voluntary, with little or no impact on course credit. It is recommended that instructors should follow formative assessments with specific guidance and remedial instruction for students who demonstrate serious deficiencies in understanding, knowledge or competence. Despite their wide use, and the fact that this issue has been examined in different curricula, the value of formative exams remains unclear. There are many authors who have reported that formative assessments did not enhance overall learning outcomes, while others have reported significant improvements.

Therefore, in this study, the researcher proposed to evaluate the possible benefits of formative assessments in any examination course and to present the outcome to the academic team at AZU. For example, for a course offered in the third quarter of a 15-quarter programme, it was considered that student participation in developing multiple-choice quiz questions used in the formative assessments would be a valuable learning exercise. It was hypothesised to the academic team that:

- The use of formative quizzes during the course would increase summative exam scores;

- Student participation in writing formative quiz questions (Student Generated Quiz Questions [SGQQs]) would produce additional increases in summative exam scores; and

- Formative quiz scores would predict subsequent summative exam performance.

The main purpose of the formative quizzes and SGQQs would be to improve performance in subsequent summative exams. On first consideration, the putative benefit of formative quizzes and student participation in writing quiz questions might go unquestioned. Researchers have reported that formative assessments enhance summative exam performance with students of different undergraduate majors. In support of the notion that formative quizzes will improve performance in subsequent written summative exams, one study found that formative quizzes had produced significantly higher summative exam scores (Zhang & Henderson, 2015); it was also believed that the SGQQs would require greater study and understanding, and this would produce an additional increase in summative exam scores. This is consistent with the theory that instructional methods that promote learner interaction are more effective than less active methods.

Several studies have suggested that formative assessments can predict summative exam outcomes. Unlike formative quizzes and formative assessments, sex, age, academic degrees and ethnicity were not found to be significant predictors of summative exam scores (Stoilescu, 2015). It is therefore believed that both formative quizzes and formative assessments should be undertaken by the academic teams in most of the departments of AZU.

5.4 Summary of the Chapter

This chapter has discussed action research approach and justified the framework and technological and pedagogical model for ICT integration. It has proposed a novel framework for increasing the effectiveness of ICT usage for teaching, learning and research activities in AZU. It has also presented problems to be solved by ICT, made suggestions for the improvement of Internet skills, and considered how to increase the impact of ICT on academic efficiency.

Furthermore, the chapter has included a comparison between the answers of academics from the DEL and DEE departments and shown the barriers to Internet usage in these cases. An investigation of the internationalisation of higher education has been presented through the framework activities. It has also examined the I-Cube model for the design and implementation of teaching and learning activities in modern HEIs, and considered the organisation of specialist training courses. It has used the instructions of the ASSURE model to formulate pedagogical activities for technology-led teaching and learning purposes. Finally,

it has discussed the evaluation of the improved ICT integrated system through users' performance.

The next chapter contains a set of recommendations for improving the effectiveness of ICT implementation within the School of Engineering at Al-Zawiya University Libya.

Chapter 6: A Set of Recommendations for the Improvement of ICT Implementation within the School of Engineering at Al-Zawiya University, Libya

The recommendations for the improvement of ICT implementation are based on the researcher's personal experience as lecturer within the School of Engineering at AZU, the literature review, quantitative and qualitative analysis of students' answers to questionnaires and responses to interviews with academic staff. Other sources of information were related to use of the Internet in the Engineering School and of ICT in general at AZU university.

A UNESCO report of 2012 focused on building the institutional capacity of teacher education institutions to design and provide training on ICT pedagogy integration for pre-service teachers. Demand for participation in higher education in Libya is unprecedented, and the country now needs to engage in a fundamental re-examination of ICT programmes, pedagogy and delivery channels in order to address the new approaches and competence levels associated with labour force competitiveness in the modern era. Learning and the advancement of knowledge must become the key focus of research efforts, underpinning a system-level capacity for sustained expansion and for continual improvement in learning outcomes and research achievements. This research and innovation will require a transformation of the entire policy framework for higher education (UNESCO, 2012).

A report by the strategy group in Ireland in January 2011 presented a National Strategy for Higher Education to 2030 by considering three elements: higher education in a changing society, planning for future demand (which is the mission of higher education in Ireland), and governance structures and funding. The researcher has tried to apply this strategy for success in the AZU context through his recommendations.

The new strategy aims to re-consider teaching and learning, and explores how to ensure that HE students can continue to have an excellent teaching and learning experience informed by up-to-date research and facilitated by a high-quality learning environment with state-of-theart learning resources.

The research and vision of this strategy deal with the core roles of HE. The proposed strategy sets out the vision for research in any HE system for the years ahead, and the details of what will be needed to realise that vision in terms of investment and capacity-building. It also describes the economic importance of linkages between research and enterprise.

In terms of engagement with wider society, the strategy examines and addresses the full range of its responsibilities towards society, including business, local communities, the wider education sector and the wider international world. It also aims to provide intellectual leadership and to act as authoritative opinion.

With regard to internationalising higher education, the strategy describes how HE increasingly involves collaboration between institutions in different countries, students following all or parts of their studies abroad, and staff movements between institutions. It outlines the opportunities for educational institutions in responding to this global trend.

6.1 Recommendations for ICT Implementation within the School of Engineering to Improve Support for Learning and Teaching Activities

- The School of Engineering should identify its relationship with modern technologies in order to draw out a clear individual policy that achieves the stakeholders' needs and matches the general policy adopted in the university and higher education sector.

- There is a need for the School of Engineering to carefully study staff and student requirements for the adoption and use of modern technology in order to improve the engagement process.

- Pedagogical and technological training courses for lecturers, technicians and students should be organised, enabling them to use new technologies for a better educational future.

- Technicians should be empowered to provide more support to lecturers and students when they use various software packages during practical lab sessions or other activities. IT specialists should pay full attention to what people think of newly imported technology in Libyan society. They should make people aware that technology is designed to develop society, by showing the beneficial side of its use.

- Training courses for managers and senior academics should be organised to help them become engaged with new technology more quickly and with full confidence.

- A flexible and secure infrastructure should be provided to support and sustain excellence in learning and teaching within the school; this should facilitate and increase the adoption rate and use of the Internet, and build up confidence and improve usage skills for staff and students.

6.2 Recommendations for ICT Implementation within the School of Engineering to Provide Support for Research and Enterprise Activities

- A flexible, reliable and secure infrastructure should be provided, with convenient access both on and off campus to databases, Internet, PCs, high performance computing, etc.
- The research community should be alerted to significant developments in ICT and information that could enhance research activities.
- Technical support and guidance should be provided to support the research community throughout the research life cycle.
- Suitable guidelines and support should be offered with regard to network requirements, data retention, information security, research data management, etc.
- A communication strategy should be defined that enhances links with the wider research community and enables effective dissemination of technological developments which will inform and assist researchers.

6.3 Recommendations for ICT Implementation within the School of Engineering to Improve Student Experience

- Social media usage and wireless provision should be expanded beyond campus boundaries in order to allow for greater and more flexible levels of student engagement with the university.

- The school should implement hardware and software solutions that enhance students' engagement with the university in terms of administration and management, making their educational experience as simple and seamless as possible.

☐ The information systems provided should be confidential, reliable and readily available, and the information stored and processed by those systems should be protected and maintained. The systems should enable the delivery of software applications over the Internet, including Web-based software, on-demand software, or software from servers hosted by providers which manage the issues of IT security, availability and performance.

☐ Learning analytics tools should be provided to enable an improved understanding and prediction of students' personal learning needs and performance by looking at their academic results and extra-curricular activities (Johnson et al., 2013).

☐ Superior analytics methodologies should be implemented for information security, in order to detect threats more quickly.

☐ There should be performance monitoring of applications and internal metrics, which could indicate future performance issues.

IT departments are working on multiple fronts to divest existing technologies and practices, to reinvest in information and mobile security, and to use analytics and educational technologies to differentiate their institution. Analytics are now permeating many higher education functions, appearing on lists in relation to learning, business performance, information security and application performance. Institutions are balancing differentiation with divesting and reinvesting, and are paying attention to technologies that can reflect the management and delivery of IT services. For example, Grajek (2016) has formulated several strategic technologies for HE, such as the inclusion of mobile devices in teaching and learning activities and the introduction of blended courses to enhance the learning experience for students and lecturers.

6.4 Recommendations for ICT Implementation within the University of Al-Zawiya

- There is a need to change AZU's policy for implementation and use of new technologies, as this university is usually seen as a model for other institutions.
- It will be necessary to issue new strategies to help various schools understand the purpose behind importing and implementing new technologies in the university.

- The university should take measures to close/reduce the digital gap by evaluating the technology transformation project from time to time; this would help to identify areas where progress has been made and those where there are still challenges to be faced.

- The relationship between academic departments and the university libraries should be enhanced so that online services can be used to meet their information needs. It is important to make sure staff are aware of the potential opportunities for improvement when using advanced IT systems.

- Opportunities should be taken to better support AZU's strategic goals by investing in new technologies that provide a platform better placed to cope with future changes.

- The current infrastructure depends heavily on non-standard solutions. ICT staff are dedicated and hardworking, but often lack wider experience of best practice and the latest trends. The lack of standards and integration makes provision of management information and information to students very difficult. This is an operational risk.

- In terms of planning, the university should identify the core objectives to be addressed in a strategy document which provides an important framework on which to base future investment. It must ensure that the policy priorities agreed to are properly met, as these are critical for future investment. The management of these objectives and expectations should be directed towards the development of an enhanced system.

- In an increasingly competitive HE marketplace, it is essential that ICT plays its part; this can be achieved by working with academic staff to improve teaching and learning facilities, asking researchers about their needs and providing services and innovations that help them thrive, and consulting with students to better understand their expectations and improve their experience.

As its principal goal, ICT must be customer focused - delivering cost effective, reliable services and programmes which are recognised for their quality and reliability. ICT should become a proactive bedrock of the institution by promoting better, faster and cheaper solutions. Information Communication Technology Departments (ICTDs) need to ensure that their operating model, investment plans and reputation are aligned with and support the institution in the achievement of its stated objectives as expressed in the strategic plan, including the promotion of stature and competitiveness. ICTDs should take a leading role in the adoption of best practice, use of innovative technology, streamlining of information flow and development and adoption of improved processes.

Liu and Evans (2016) have indicated the necessity of considering ICTDs as key stakeholders in devising and overseeing a range of ICT policies, including access control, identity management, data handling, information management and data warehousing. They should also be involved in the development of policies regarding security (internal and external threats), as well as support for mobile devices and operating systems (e.g. printing and licence management).

- A strategic and operational ICTD should therefore be introduced to be responsible for all shared ICT infrastructure and technology and to replace the various legacy systems used by the university. This is an important step, enabling a move toward the increasing adoption of unified communications across many faculties (with voice, instant messaging, video, shared apps., etc.). Using best practice, technology scanning and capacity planning, the ICTD will design the overall target infrastructure. An 'infrastructure roadmap' should be developed to manage delivery, and the ICTD must continue to keep abreast of emerging technologies in order to understand how these might impact on the university's ICT plans and on any other strategies that depend on ICT capability.

- With regard to analysis of business requirements and information management, an information management strategy should be established in the University. The ICTD should work with others to collate key business requirements and to initiate the process of reengineering activities to deliver improved performance and enhance decision-making processes. It is expected that this will focus on implementing data warehousing and defining critical systems integration requirements and solutions.

6.4.1 Implementation plan

An implementation plan will ultimately define the technology roadmap which the university will follow. The full plan must reflect current and projected, prioritised user needs and demands, reliability, resilience, scalability and how those translate into technical requirements. It will include a gap analysis between current status and the technology trajectory chosen. In the early stages, only high-level components of the implementation plan will be understood.

The report of the Universities UK Efficiency and Modernisation Task Group (UUK, 2011) confirms that any effective HEI is already looking to develop new working practices and

approaches. Embedding a continuous commitment to efficiency will therefore be important; this will involve continually responding to challenges and evaluating operational effectiveness.

6.4.2 Framework for continuous improvement

The best solutions for improving the present situation will come from thinking about efficiency, which includes simplification of internal processes and standardisation within or between organisations at one end, and outsourcing at the other. The range of mechanisms for achieving such efficiency, along with the potential benefits of each and the challenges associated with competing methods, is shown in Figure 6.1.
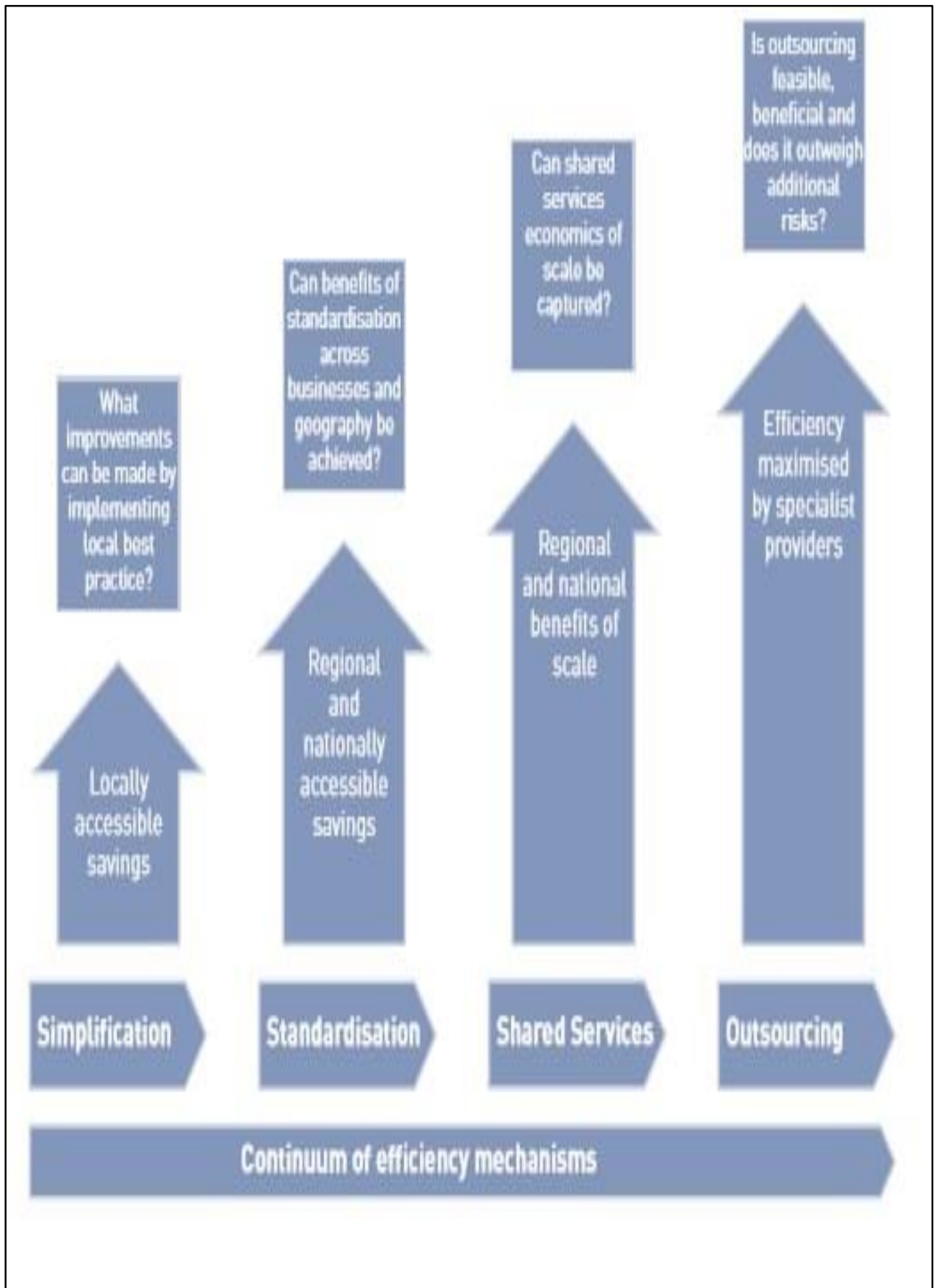
Figure 6.1: Increasing impact of efficiency measures (UUK, 2011)

6.4.3 Improvement, simplification and standardisation

The evidence presented thus far, which has examined developments in the higher education sector, demonstrates that significant benefits can be made from internal process improvement, simplification and standardisation. It may be concluded that the university sector in general is making good progress and that the scale and scope of its activities is as diverse as the sector itself. This study proposes that the most successful programmes appear to be those that:

1. are of a scale to make an institution-wide financial impact

2. involve stakeholders

3. focus on benefits to students and staff

4. are overseen by strong programme management, and

5. use data to inform all concerned both of the scale of the challenge and the benefits.

6.4.4 ICT infrastructure upgrade programme (over next 5 years)

In order to upgrade and improve the security and resilience of the ICT infrastructure, the following measures will need to be taken:

☐ Implement secure remote access to IT resources for staff and students;

☐ Commission alternative modes of application delivery (online, network based), especially for use by students and lecturers;

☐ Deploy bandwidth shaping devices to remove network bottlenecks and reduce latency;

☐ Renew firewalls and optimise configuration;

☐ Renew switches and another network equipment to support WIFI and VOIP.

☐ Wireless:

a) Perform a WIFI site survey;

b) Deploy WIFI across the Al Zawiya campus and student accommodation;

c) Renew firewalls and optimise configuration.

☐ Telephony:

a) Deploy VOIP telephony as part of unified communications deployment;

b) Deploy Lync (will become part of unified communications);

c) Introduce a mobile phone strategy and m-learning. Deploy mobile telephony;

d) Migration of telephony service to ICTD.

The digital divide still exists in Libya and negatively affects the ability of its universities to use information technology. Libya experiences limitations in ICT access due to geographic, infrastructure and educational limitations, along with a history of restrictively traditional cultural values. These factors affect the experience and development of Libyan academic staff, which eventually affects students. This general problem evolves into a twofold manifest that includes limited research on the part of academic staff and lack of understanding of the perspectives of these universities in the context of the digital divide (Elzawi et al., 2013a).

6.5 Recommendations for ICT Implementation by the Higher Education Ministry

☐ The Higher Education Ministry should modify or change the old instructional regulations, which limit the approval and use of new technology, to new ones which consider the Internet and other technologies as valid educational tools.

☐ Higher education regulations should obligate everyone in the Libyan higher education sector to adopt and use the Internet and new technological means.

☐ The Libyan Higher Education Ministry should obligate all universities and colleges to issue their own policies for acceptance and use of the Internet as a professional means.

☐ The Libyan Higher Education Ministry should provide sufficient funds and spend generously to run such a massive transformative project in the context of the traditional nature of Libyan Higher Education.

☐ The Libyan Higher Education Ministry should establish training centres in each region in Libya, and should obligate academic and administrative staff to attend training sessions to make this transformative project run successfully.

6.6 Recommendations for ICT Implementation by the Libyan Government

The Libyan Government should apply a new policy to introduce the adoption of modern technologies; this should be applied as a means of managing a countrywide transformative plan to introduce the implementation of new technologies into all Libyan governmental and societal sectors.

The Libyan Government should put in place a pre-planned e-government project which was announced several years ago, which was designed to train staff in the public sector to devise the implementation of new technologies and show their benefits to society.

The Libyan Government should issue new laws and assume new legal frameworks to facilitate the adoption and use of new technologies for managing work, education and business.

The Libyan Government should carry out more research to discover the barriers to adoption of new technology, and provide appropriate solutions to resolve any challenges faced.

There are many Libyan authors and researchers (e.g. Rhema, 2013; Othman et al., 2013; Bakeer & Wynn, 2014; Kenan et al., 2014; Abusrewel, 2014) who have considered and written about different issues which influence the effectiveness of ICT in Libyan universities and HEIs. In general, it is felt that the following issues should be taken into account:

- Libyan HEIs need to develop more Arabic sites on the Internet, so that modules can be designed in the Arabic language for students.
- There is a need to introduce trainee teachers to the use of online teaching resources to prepare them to develop and design courses; this should be an integral part of a teacher training programme.
- Similar training should be provided for lecturers at all levels and in all disciplines.
- It is important to encourage universities to provide online courses. This would help solve the problem of shortage of lecturing staff and teaching space.
- When designing online courses, the following should be considered: the importance of setting goals, tasks and electronic discussions clearly; the use of public and private messages to give feedback on all targets and tasks; meeting with students on face-to-face visits before the start of study; the integration of chat rooms and discussion threads within modules; emphasis on the need for time commitment and encouragement of students to commit to this; the need to train students to connect to the Internet and gain access to sites several weeks before the start of their course of study; and training in additional techniques used for remote connection such as by audio, image and telephone when necessary.
- When using e-courses for the first time, the skill level of students in the use of the computers should be determined and the requirements of the existing computer use policy should be identified and strengthened.
- Students' skills and attitudes should be continuously evaluated, and diversification of the educational components should be ensured. Students should be provided with the necessary technical support by the school or the department, particularly in relation to Web design.

- The first lectures for university students should be convened in the traditional manner to enable students to meet face-to-face with their colleagues at least once. Graduate students should be used to help guide Bachelor's degree students.

- Course content should be provided in several ways, making use of a number of channels of communication to ensure flexibility. Contact should be made with students by telephone and initial notes distributed to them.

6.7 Summary of the Chapter

The HE system is not separate from the rest of society; it is integral to it. The standard of living enjoyed by Libyan citizens is intimately bound up with the development of the higher education system. Implementation of the recommendations set out in this chapter will ensure that the LHE system is enabled to make its full contribution to the tasks of improving the quality of HE for Libyan stakeholders, and of tackling the world's major social, economic and environmental challenges.

This strategy sets out the directions for development and change required in HE over the next few years. The next challenge is to deliver on this change. This can only be achieved through a spirit of partnership and engagement at all levels of the system and through appropriate implementation arrangements to successfully harness the innovations. It is recommended that this be addressed by the government as part of its overall consideration.

This chapter has provided recommendations for ICT implementation within the School of Engineering to improve support for learning and teaching activities, and explained how this could also provide support for research and enterprise activities to improve student experience.

Other, related recommendations for ICT implementation within the University of Al Zawiya have included a high level implementation plan embedding a continuous commitment to efficiency in higher education. Suggestions for an ICT infrastructure upgrade programme have also been presented, followed by recommendations for ICT implementation by the Higher Education Ministry and the Libyan Government.

The next chapter contains the conclusions, contribution to knowledge and suggestion for future work.

Chapter 7 – Conclusions and Future Work

The aim of the project was to investigate the attitude of lecturers and students from Al-Zawiya University in Libya towards the use of Internet technology for academic purposes, and to formulate a set of recommendations for upgrading the quality and effectiveness of ICT implementation within the university's School of Engineering. The aim and objectives defined in Chapter 1 have been achieved.

The main conclusions of this project are as follows:

• The ICT gap in the educational system in Libya was identified after analysing the effect of political, social, cultural, geographical and economic factors, as well as barriers (sections 2.2, 2.3 and 2.6) related to ICT implementation at macro and micro levels. Overcoming these barriers would enable the educational stakeholders to enjoy improved collaboration and learning experiences (see Chapter 2).

• The research instrument used to determine students' attitudes towards use of the Internet for learning was a questionnaire, which was distributed via email to 60 students. The questions were grouped based on the research hypotheses (see section 1.6), and the questionnaire was designed taking into account the aspects of reliability, validity, bias and ethical considerations (section 3.3).

• Quantitative analysis of students' answers to the questionnaire was done using the SPSS software package. The results (see sections 4.1 and 4.2) showed that the effectiveness of integrating computers into the learning environment depends on the skills of human resources (academics, students and technicians), availability of computing resources (hardware and software) and infrastructure (practical layout of laboratory and classroom facilities). The students showed positive user attitudes towards ICT because they are digital natives who are familiar with the latest digital technology.

• Semi-structured telephone interviews (see section 4.4) were used as research instruments to evaluate academics' attitudes towards use of the Internet for the design of course materials, research purposes and communication with students. The academics interviewed had various roles and age groups and worked in two departments (DEE – Department of Electrical Engineering and DEL – Department of English Language), so they used the Internet for instruction in different fields of study. The open-ended questions aimed to determine various components of the academics' attitudes towards use of the Internet, including cognitive components (expectations, awareness and values), performance components (conduct and actions) and affective components (motivation and emotions).

• The links between the interview responses and the research hypotheses (see Table 5.20) substantiate the view that both individual (gender, age, field of study, self-efficacy, experience) and social (culture, context, ideology) factors affect academics' perceptions regarding the usefulness and comfort of using the Internet.

- A novel framework for increasing the effectiveness of ICT usage for teaching, learning and research activities in AZU is described in Chapter 5. It is based on a two-dimensional model (educational and technological dimensions) for measuring individual teachers' progression in ICT integration. An action research approach, the ASSURE model, the I-Cube model and theories regarding the internationalisation of HE has all been used to formulate activities aiming to enable the implementation of ICT-supported pedagogical innovation in the School of Engineering at AZU.

- Finally, a set of suggestions (see Chapter 6) has been formulated for the improvement of ICT implementation. These suggestions aim to enhance the quality of teaching, learning, research, enterprise activities and student experience within the School of Engineering at AZU. They are based on the researcher's personal experience, existing publications and the results of analysis of answers to questionnaires and interviews with academic staff.

7.1 Contribution to Knowledge

- A thorough exploration of the ICT gap in the Libyan educational system has been performed, as well as identification of the key factors which could influence the adoption and use of the Internet by LHEIs.

- Quantitative analysis of students' answers to the questionnaire showed a positive attitude towards ICT use; this was because they speak the 'digital language' and are aware of the potential of technology in supporting the knowledge construction process, sharing information, collaboration in projects and connection to relevant networks and communities.

- Qualitative analysis of academics' responses to interview questions revealed the factors (age, confidence, knowledge and gender) which influence their decisions regarding the use of ICT, and the components (cognitive, performance and affective) of their attitude towards ICT usage for educational purposes.

- A novel framework for ICT implementation in a modern educational environment has been developed. The effectiveness of teaching, learning, research and enterprise processes, as well as the level of student satisfaction, can be increased by designing and implementing relevant activities related to technological and pedagogical aspects of ICT integration in education.

- A set of recommendations for successful ICT implementation within the School of Engineering at AZU has been formulated. ICT should enable reduced consumption of resources and increased learning outcomes while attracting talented students and providing innovative learning experiences. Therefore, there should be close and effective collaboration between the primary stakeholders of higher education institutions, i.e. students, lecturers and policy makers within the institution, when implementing ICT in schools and universities and organising relevant training courses.

7.2 Future Work

The proposed framework for ICT implementation could be applied within other schools and departments at AZU by considering the specific conditions when formulating activities. Furthermore, this framework could be applicable to a range of different and related ICT courses in the various universities of Libya.

Questionnaires could be designed which ask students and staff to provide various suggestions for renewing the strategies of ICT implementation at AZU, and to identify their technology acceptance levels.

An appropriate time could be established within the study plan for the academic year when the effectiveness of ICT implementation is measured, and evidence provided.

An evaluation could be conducted over one academic year to determine the difference between courses that have applied the ICT framework and others that have not applied the framework.

Other models that have a high level of effectiveness in learning and teaching, such as the ASSURE or I-Cube models, could be used to evaluate and monitor continued developments in the application of ICT.

ICT strategies should be developed at school and university levels, enabling local and global collaboration and partnership between academics, researchers, students, technicians and IT staff. These strategies should ensure that communication is effective, and that information is shared in a secure manner.

More research should be undertaken into the pedagogical aspects of ICT implementation, i.e. about the influence of ICT on the educational value of learning experiences, the effect of learning styles on ICT usage, lecturers' attitude towards ICT use and student motivation, etc.

The research results presented in this thesis can be used to formulate an advanced strategy for increasing the effectiveness of ICT usage for teaching, learning and research activities, and to solve problems of ICT usage within HE. They can also be used to improve Internet skills through planning and developing the content of learning resources and new academic approaches.

7.3 Final View of Thesis

This study has offered an exploration of the nature of Internet use by Libyan academics at AZU for academic purposes, and investigated the influence of societal culture on various characteristics of Internet usage. It has underlined the complex nature of Internet technology and the wide range of factors influencing its adoption and use. The factors explored were associated with societal and organisational issues, and those found to play an important role in adoption of the Internet were regulation, university leadership and direct benefits to academics. Factors working for adoption of the Internet were the features of the Internet, efficiency of communication and poor library services. Factors working against adoption of the Internet were attitudes toward the Internet, the Arabic language, and lack of training and support. The review of relevant literature provided many theories, models and frameworks which have contributed to knowledge, and also enabled some of the ICT gap to be closed, by focusing on uncovering a significant region in the world and addressing the issue of Internet adoption in Libyan universities.

The significance of the study's findings is that they can provide scholars, IT managers, educators, librarians and technicians with a wide range of valuable information. It is hoped, therefore, that this thesis will contribute to the adoption of Internet technology and diffusion of its use within developing societies. This study has also aimed to identify the reasons for adopting new technologies. The theoretical framework was used to propose a new framework for increasing the effectiveness of ICT usage for teaching, learning and research activities in AZU. These theories were able to guide the researcher in addressing this complicated issue and presenting the problems to be solved by ICT, as well as in demonstrating how improvement in ICT skills can have a beneficial impact on academic efficiency.

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Appendix A: The Questionnaire Survey for Students

Name (optional)   : _____

Gender   : _____

Institute   : _____

1. Demographics:
    a. Which part of Libya do you belong to?
    b. Why are you living in Tripoli?
    a. _____
    b. _____

2. For which degree of information technology (it) are you enrolled in:
    □ Higher education certification
    □ Diploma
    □ Bachelors
    □ Masters
    □ Other (please specify)

_____

3. Where do you prefer to do your phd? □   In Libyan university
    □ In some foreign university
    □ No plan to do PhD

4. How many semesters of your it programme are left?
    □
         On
    e □
         Tw
    o
    □ Three
    □ Four
    □ Other (please elaborate)

_____

5. does the it lab satisfy the needs of students?
    □ Agreed
    □ Strongly agreed
    □ Disagreed
    □ Strongly disagreed
    □ Neutral

6. What are your fields of interests in this area?
    □ Software programming
    □ Database administration
    □ Internet programming
    □ Graphics
    □ Software Project Management (SPM)
    □ Yet to decide

□ Other

7. Does your university offer state-of-the-art hardware/software?
   - □ Yes
   - □ No
   - □ Other

   _____

8. Are you satisfied with the technical it apparatus and teaching staff for below mentioned languages or software study? (java   or   c#   or   other software)
   - □ Satisfied
   - □ Not satisfied
   - □ Neutral

9. Does hands-on training offer at your university?
   - □ Yes
   - □ No
   - □ Other

10. Rate the present curriculum and ICT infrastructure of your university?
   - □ excellent
   - □ Good
   - □ Average
   - □ Bad
   - □ Poor

11. Mention the restrictions of the present curriculum?
   - □ Out-dated it infrastructure
   - □ Lack of experienced teachers
   - □ No practical assignments
   - □ Other _____

12. Why have you chosen this field of study?
   - □ Personal interest
   - □ Greater quantity of jobs availability in the country's market
   - □ Greater job availability in the international market
   - □ Highly salary offers
   - □ Communal pressure

_____

13. Which option do you like to pick?
   - □ I will stay in the country
   - □ I will move abroad
   - □ Not yet decided
   - □ Other

14. How significant is the function of ICT in the fiscal growth of a state?
   - □ Extremely important
   - □ Important
   - □ Not-so-important
   - □ Not-at-all important

15. The current condition of ICT facility in the country is:
- ☐ Highly satisfactory
- ☐ Satisfactory
- ☐ Neutral
- ☐ Unsatisfactory
- ☐ Highly unsatisfactory

16. What is the most fundamental cause for the slow development of the ict in libya (three different options can be chosen)?
- ☐ Lack of technical staff
- ☐ Lack of universities
- ☐ Lack of trained instructors
- ☐ No/partial backing from the government
- ☐ Poor infrastructure

_____

17. Please give proposals in order to develop ict infrastructure in educational institutions of libya.

_____

Appendix B: The interview questions about the nature of Internet usage

Section A. Use of the Internet for communicating with students:

QUESTION A1 - When did you start using the Internet for contacting students?

QUESTION A2 - Where do you use the Internet for contacting students?

QUESTION A3 - Which Internet applications or tools do you use for contacting students?

QUESTION A4 - What obstacles do you face in using the Internet for contacting students?

QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting students?

Section B. Use of the Internet for reviewing literature and writing papers:

QUESTION B1 - When did you start using the Internet for reviewing literature and writing papers?

QUESTION B2 - Where do you use the Internet for reviewing literature for writing papers?

QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for writing papers?

QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature and writing papers?

QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing literature for writing papers?

C. Use of the Internet for preparing teaching materials:

QUESTION C1 - When did you start using the Internet for preparing teaching materials?

QUESTION C2 - Where do you use the Internet for preparing teaching materials?

QUESTION C3 - How successful is your use of the Internet for preparing teaching materials?

QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching materials?

QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing teaching materials?

Appendix C: The cover letter for questionnaire

Date
Dear Participant:

My name is Abdussalam El-Zawi and I am a PhD student at University of Huddersfield, United Kingdom. For my PhD project, I am examining 'The attitudes of academic staff and students towards the use of Internet technology for teaching and research at Al zawyia University in Libya'. Because you are student at this University, I am inviting you to participate in this research study by completing the attached questionnaire.

The following questionnaire will require approximately 15 minutes to complete. There is no compensation for responding nor is there any known risk. In order to ensure that all information will remain confidential, please do not include your name. Copies of the PhD thesis will be provided to the University of Huddersfield Library.
If you choose to participate in this questionaire, please answer all questions as honestly as possible and return the completed questionnaires promptly by email. Participation is strictly voluntary and you may refuse to participate at any time.

Thank you for taking the time to assist me with my project. The data collected will provide useful information regarding my project. Completion and return of the questionnaire will indicate your willingness to participate in this study. If you require additional information or have questions, please contact me at the number listed below.

Sincerely,

Abdussalam Elzawi

PhD researcher, Department of Informatics
School of Computing and Engineering, University of Huddersfield
Huddersfield, HD1 3DH, Tel: +44(0) 1484 47 1286, abdussalam.elzawi@hud.ac.uk

Appendix D: The transcripts of interviews

Trascription of interviews of Department of English Language

:The interview questions with nature of Internet usage

<u>:Section A: Use of the Internet for communicating with students</u>

?**QUESTION A1 -** When did you start using the Internet for contacting students

A- "I look forward to being in touch with my undergraduate students in the virtual
"environment. However, haven't completed it yet

?**QUESTION A2 -** Where do you use the Internet for contacting students

A-"Usually I spend around one- two hours daily on the Internet but in terms of searching
"time I spend much longer

?**QUESTION A3 -** Which Internet applications or tools do you use for contacting students

"**A**-" I use only Yahoo mail to contact my postgraduate students, it is better

?**QUESTION A4- .**What obstacles do you face in using the Internet for contacting students

"**A**- " I use only Yahoo mail to contact my postgraduate students, it is better

QUESTION A5- How does the use of Arabic influence the use of the Internet for contacting
?students

".**A**-"We have limited information sources in Arabic

<u>:Section B: Use of the Internet for reviewing literature and writing papers</u>

QUESTION B1 - When did you start using the Internet for reviewing literature and writing
?papers

A-"The use of the Internet for preparing teaching materials is less successful

?**QUESTION B2 -** Where do you use the Internet for reviewing literature for writing papers

A-"I started using the Internet for contacting students only two year ago

QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for
?writing papers

"**A**-"We are not capable to make our students use audio-visual materials for learning
QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature
?and writing papers

A- "When we compare the availability of information resources on the Internet to the
,traditional information resources in libraries, we can say that the government's documents
"like archives and academic work, are made available in better and easier forms

QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing
?literature for writing papers

A-"It is different when you use the Internet in Arabic because we have limited availability of
"information sources

?**QUESTION C1-** When did you start using the Internet for preparing teaching materials

"**A**-"I don't feel happy to share everything online with my students

?**QUESTION C2-** Where do you use the Internet for preparing teaching materials

A-"The importance of the Internet is related to ordering books and other information materials

?**QUESTION C3-** How successful is your use of the Internet for preparing teaching materials

,**A**-"The use of the Internet for academic purposes conflicts with some societal beliefs particularly for female students who cannot be totally engaged with Internet technology as "a result of societal control

QUESTION C4- What obstacles do you face in use of the Internet for preparing teaching ?materials

A-"The availability of the Internet in classes is considered as the major problems as they lack the use of the Internet for teaching activities. We are not capable of making interactions with "our students through the Internet audio-visual material directly in classes

QUESTION C5- How does the use of Arabic influence your use of the Internet for preparing ?teaching materials

A- "My personal fears in the use of the Internet relate to being in contact with some unidentified people or aliases as this will waste our time

DEL2

:The interview questions with nature of Internet usage

?**QUESTION A1 -** When did you start using the Internet for contacting students

A- "I started using the Internet for contacting students- only two year ago, the aim was mainly "to contact students who studied away from the university campus

?**QUESTION A2 -** Where do you use the Internet for contacting students

A-"Students are considered as a blanket page in the field and I want them to construct "correctly, precise and convincing knowledge

?**QUESTION A3 -** Which Internet applications or tools do you use for contacting students

A-"The university website doesn't provide required resources/journals and books in my "subject

?**QUESTION A4 -** What obstacles do you face in using the Internet for contacting students

"**A-**"I use E-mail to get in touch with my students because they know how to use it

QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting ?students

A- I contact my students in Arabic. However, I use English to deal with different issues more effectively and indeed as I am happier with English"

QUESTION B1- When did you start using the Internet for reviewing literature and writing papers?

A- "I started implementing the Internet for reviewing the literature in my field in 2005. However, consider this date as the starting point of using the Internet in my scientific life, especially when the Internet was available in the university and my house as well"

QUESTION B2 - Where do you use the Internet for reviewing literature for writing papers?

A-"Actually, I have the Internet anywhere, but I did not used it in preparing teaching materials"

QUESTION B3- Which Internet websites or tools do you use for reviewing literature for writing papers?

A-"I teach in Arabic and, in this case, information resources are less credible"

QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature and writing papers?

A- "The Internet as a source of information is much better than traditional academic libraries"

QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing literature for writing papers?

A-"I use the Internet to improve my English language and look up proper definitions of local expressions"

QUESTION C1 - When did you start using the Internet for preparing teaching materials?

A-"I do not be sure of on the Internet to search for teaching things correct. However, its usage for this purpose is less than the other scientific principles"

QUESTION C2 - Where do you use the Internet for preparing teaching materials?

A- "I guide my students only to the scientific news websites"

QUESTION C3 - How successful is your use of the Internet for preparing teaching materials?

A- "There is a decent matter in the use of the Internet for contacting female students especially outside of study times where that can be considered as infringement of confidentiality"

QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching materials?

A-"Providing computers, high speed access to the Internet and technology equipment's is still difficult"

QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing teaching materials?

A- "I teach in Arabic and, in this case, information resources are less credible"

DEL3

The interview questions with nature of Internet usage:

[Section A: Use of the Internet for communicating with students:](#)

QUESTION A1 - When did you start using the Internet for contacting students?

A- "I started using the Internet to communicate with students only and half years ago."

QUESTION A2 - Where do you use the Internet for contacting students?

A- "Use of the Internet for teaching activities doesn't exceed 10% of my general usage"
B- **QUESTION A3 -** Which Internet applications or tools do you use for contacting students?
A- "It is observed that some Internet materials are interspersed with plagiarism"
QUESTION A4 - What obstacles do you face in using the Internet for contacting students?

A- "Many information resources obtained from the Internet did not address the issues in depth"
QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting students?

A- "I do not mind uploading my contact details on the university website"

[Section B: Use of the Internet for reviewing literature and writing papers:](#)

QUESTION B1- When did you start using the Internet for reviewing literature and writing papers?

A- "I do not use the Internet only to get new sources of information but it also helps me in outlining my research proposals"
QUESTION B2 - Where do you use the Internet for reviewing literature for writing papers?

A- "The main way to follow up the literature is through the Internet" .
QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for writing papers?

Indeed Internet searching for a specific issue is much more effective than traditional ways in libraries. Further, you can obtain more than enough information just by adding one word to the search engine"

QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature and writing papers?

A- "I obtain around 70% of my required information from the Internet"

QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing literature for writing papers?

A- "The Internet facilitates translating from English into Arabic and vice versa"

Section C : Use of the Internet for preparing teaching materials:

QUESTION C1 - When did you start using the Internet for preparing teaching materials?

A- "This matter is usually connected with students' positive perspectives of Internet use".

QUESTION C2 - Where do you use the Internet for preparing teaching materials?

A- "Internet information resources currently are not that advantageous"

QUESTION C3 - How successful is your use of the Internet for preparing teaching materials?

A- "If you have got basic computer skills, then the use of the Internet becomes very easy"

QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching materials?

A- "Information attained from the Internet is often not trustworthy. So, I do not want to deliver imprecise information to my students. Furthermore, we are required to use recognized sources of information that have been written by well-known writers in the field"

QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing teaching materials?

A- "My personal fears in the use of the Internet relate to being in contact with some unidentified people or aliases as this will waste our time"

DEL4

The interview questions with nature of Internet usage:

Section A: Use of the Internet for communicating with students:

QUESTION A1 - When did you start using the Internet for contacting students?

A- I use the Internet mainly for obtaining new studies"

QUESTION A2 - Where do you use the Internet for contacting students?

A- "Sometimes, I use the Internet in the computer lab at the Faculty of Engineering. However, some other times, I also use it at my home".

QUESTION A3 - Which Internet applications or tools do you use for contacting students?

A- "The Internet translating tools are the secret behind successful use"

QUESTION A4 - What obstacles do you face in using the Internet for contacting students?

A- I use only Yahoo mail in respect of contacting my students because it is a well- known"
"application

QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting
?students

A- I find that it is not easy to communicate with my female students when they are at"
"homes; this might create trouble for me; or at least for them

QUESTION B1- When did you start using the Internet for reviewing literature and writing
?papers

A- Actually, I use the Internet mainly for obtaining new studies; therefore I consider it as"
"a significant technology in supplying information
?**QUESTION B2-** Where do you use the Internet for reviewing literature for writing papers

A- "I like use the internet in the home, espacially when writing the papers"
QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for
?writing papers

A- The Internet is important for exploring and comparing new thoughts, particularly to"
"foreign studies
QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature
?and writing papers

A- "The internet saves time and effort in contacting scholars across the globe"
QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing
?literature for writing papers

A- My usage for the internet still a weak as compare with the internationl school for the"
"languages, our school needs to more support for the resources

?**QUESTION C1 -** When did you start using the Internet for preparing teaching materials

A- Students feel that use of the Internet will add more difficulties to the educational" "process
?**QUESTION C2 -** Where do you use the Internet for preparing teaching materials

A- I don't know if Internet technology will be a good means for delivering teaching"
"constituents in classes. We have no experience to confirm its validity
?**QUESTION C3 -** How successful is your use of the Internet for preparing teaching materials

A- ,There is a decent matter in the use of the Internet for contacting female students"
especially outside of study times where that can be considered as infringement of
"confidentiality
QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching
?materials

A- My concern about using the Internet for preparing teaching materials is linked to the"
"use of non-credited sources of information which cause scientific confusion for the students

QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing teaching materials?

The university website doesn't provide required resources/journals and books in my subject"

DEL5

The interview questions with nature of Internet usage:

[Section A : Use of the Internet for communicating with students:](#)

QUESTION A1 - When did you start using the Internet for contacting students?

A- " I do not use the Internet to learning with my students"
QUESTION A2 - Where do you use the Internet for contacting students?

A- "The length of my Internet use is connected to my requests"
QUESTION A3 - Which Internet applications or tools do you use for contacting students?

A- "The Internet links us to the globe and opens our eyes to the current issues in the field"
QUESTION A4 - What obstacles do you face in using the Internet for contacting students?

A- "Students are considered as a blanket page in the field and I want them to construct correctly, precise and convincing knowledge
QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting students?

A- " I challenged some difficulties at the beginning when I started using the Internet regarding communicating with students for instructional purposes. Students hacked my email and changed my password. However, when I spoke to them in my lectures and explained that the Internet would be used as an assistant educational means and wouldn't add any extra learning to load on them, they responded completely".

[Section B : Use of the Internet for reviewing literature and writing papers:](#)

QUESTION B1- When did you start using the Internet for reviewing literature and writing papers?

A- "Even though the Internet in the home is expensive; but is in the home more Sslowly"-
QUESTION B2 - Where do you use the Internet for reviewing literature for writing papers?

A- "My top fear about using the Internet was connected to students' scientific confusion" "and lack of information skills
QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for writing papers?

A- "Providing computers, high speed access to the Internet and technology equipments is still difficult"
QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature and writing papers?

A- During teaching, I can't manage technical problems such as slowness and interruption"
"of the Internet

QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing
literature for writing papers?

A- "I think it is difficult to exclude the university from any social influence"**.**

QUESTION C1 - When did you start using the Internet for preparing teaching materials?

A- I do not rely on internet information resources for teaching preparation
QUESTION C2 - Where do you use the Internet for preparing teaching materials?

A- Of course, there are some useful websites related to teaching material preparation but"
" in fact, most these websites replicate non-credible thoughts or just personal views
QUESTION C3 - How successful is your use of the Internet for preparing teaching materials?

A- "Use of the Internet for teaching activities doesn't go over 10% of my general usage"
QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching
materials?

A- "Information obtained from the same source is regularly repeated"
QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing
teaching materials?

A- "Most of the websites are available in the English language"

DEL6

:The interview questions with nature of Internet usage

QUESTION A1 - When did you start using the Internet for contacting students?

A- Actually, I am not in contact with my students through the Internet. I use the Internet
only to contact my friends, colleagues .
QUESTION A2 - Where do you use the Internet for contacting students?

A- I use the Internet in different places: sometimes in the university and sometimes in my
home"
QUESTION A3 - Which Internet applications or tools do you use for contacting students?

A- I don't use the Internet frequently for teaching preparation; it's not my fundamental" .
target at all"
QUESTION A4 - What obstacles do you face in using the Internet for contacting students?

A- I think that the style of our teaching is still traditional, so it is very difficult to convince"
others to change their minds"
QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting
students?

A- The culture of the Internet use in the Libyan society is not widespread because"

:Section B : Use of the Internet for reviewing literature and writing papers

QUESTION B1- When did you start using the Internet for reviewing literature and writing papers?

I started using the Internet to obtain professional instrument about a year ago, this was one of my barrier purposes of Internet use"
QUESTION B2- Where do you use the Internet for reviewing literature for writing papers?

A- "When I do research, I used computer labs at the library"
QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for writing papers?

A- "I don't have much experience in using the Internet for professional purposes"
QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature and writing papers?

A- "I think the most important thing is that you are linked to many modern sources of ... information. Thus, it supports your exploration of more subjects and helps to expand your thinking and improve the quality of your searches"
QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing literature for writing papers?

A- ".We have limited information sources in Arabic"

:Section C : Use of the Internet for preparing teaching materials

QUESTION C1 - When did you start using the Internet for preparing teaching materials?

A- I don't use the Internet normally for teaching preparation; it's not my fundamental" "target at all
QUESTION C2 - Where do you use the Internet for preparing teaching materials?

A- "Many professional materials are available in the library but what is special about the Internet is that you can search and manage materials more easily and faster"
QUESTION C3 - How successful is your use of the Internet for preparing teaching materials?

A- "I believe use of educational applications gives the sense of perfection"
QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching materials?

A- "Of course, there are many issues on the web pages that are misleading and we need to be careful in handling information. However, as educated people, we know what we need or what to select; but I am not sure about students"
QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing teaching materials?

A- "Use of Arabic web pages only retrieves poor out-dated information"

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:The interview questions with nature of Internet usage

:Section A : Use of the Internet for communicating with students

?**QUESTION A1 -.**When did you start using the Internet for contacting students

A-   ".I started the actual use of the Internet in respect of contacting students in 2006"
?**QUESTION A2 -** Where do you use the Internet for contacting students

A- Personal communication with students is not common yet, whereas it is more commonly"
"used between academics
?**QUESTION A3 -** Which Internet applications or tools do you use for contacting students

A- "I believe use of educational applications gives the sense of perfection"
?**QUESTION A4** - What obstacles do you face in using the Internet for contacting students

A- I didn't encounter any difficulties in dealing with my students through the Internet" "means
 QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting
?students

A- E-books an example of the used websites to obtain free books, in addition to the Arab"
.Statisticians website

:Section B: Use of the Internet for reviewing literature and writing papers

 QUESTION B1- When did you start using the Internet for reviewing literature and writing
?papers

A- ",I started using the Internet to obtain professional instrument about a year ago"
?**QUESTION B2 -** Where do you use the Internet for reviewing literature for writing papers

A- We exploit the Internet very well in respect of reviewing the literature"
 QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for
 ?writing papers

A- E-book 3000 is an example of the used websites to obtain free books, in addition to the"
"Arab Statisticians website
 QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature
?and writing papers

A- " we look forward to literate people to improve the Internet use
 QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing
?literature for writing papers

A- ".We have limited information sources in Arabic"

?**QUESTION C1 -** When did you start using the Internet for preparing teaching materials

A- I started using the Internet to obtain professional instrument about a year ago, this was"
"one of my barrier purposes of Internet use
?**QUESTION C2 -** Where do you use the Internet for preparing teaching materials

Actually, I have the Internet anywhere, but I did not used it in preparing teaching
"materials
?**QUESTION C3 -** How successful is your use of the Internet for preparing teaching materials

A- "It is observed that some Internet materials are interspersed with plagiarism"
QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching
?materials

A- "I did not break the compatibility barrier to help academics make the right decision"
QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing
?teaching materials

A- when you use the Internet in Arabic because we have limited availability of information "
"sources

DEE2

:The interview questions with nature of Internet usage

?**QUESTION A1 -** When did you start using the Internet for contacting students

A- I have started in using the Internet since it is access in our department it was from the"
."2010
?**QUESTION A2 -** Where do you use the Internet for contacting students

A- There is a psychological reason which hinders their acceptance to communicate with"
"...their students electronically
?**QUESTION A3 -** Which Internet applications or tools do you use for contacting students

A- Dealing with large number of technological means and applications doesn't give us"
"opportunity to think about determinists of cultural identity
?**QUESTION A4 -** What obstacles do you face in using the Internet for contacting students

A- To avoid any sensitivity, I think educators should not contact their students directly in"
,person. Messages can be generated to all enrolled students in the study group. Thus
"transparency would help in the acceptance of this type of connection
QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting
?students

A- Use of the Arabic language duplicates our work because I need to translate materials"
".from English or German into Arabic before sending them to students

QUESTION B1- When did you start using the Internet for reviewing literature and writing papers?

A- "It should be understood that use of communication technology is not only for espionage"
QUESTION B2 - Where do you use the Internet for reviewing literature for writing papers?

A- "Mainly, I use soft materials in respect of writing papers just because they are easy to manage: store, copy, past, edit, transform or send"
QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for writing papers?

A- "I use sources of information on the Internet to improve my thoughts and explore the novel and in issues in the field"
QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature and writing papers?

A- "Some academics seek to use the easiest technological applications in Internet because they are convenient"
QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing literature for writing papers?

A- "I used limited information sources in Arabic."
:Section C : Use of the Internet for preparing teaching materials

QUESTION C1 - When did you start using the Internet for preparing teaching materials?

A- "I am using the Internet to obtain professional instrument about a year ago, this was one of my barrier purposes of Internet use with materials"
QUESTION C2 - Where do you use the Internet for preparing teaching materials?

A- "The problem is related to some local people who believe openness to the outside... world is risky and must be controlled"
QUESTION C3 - How successful is your use of the Internet for preparing teaching materials?

A- "One side of the problem in the use of the Internet is its availability for all social levels. Therefore, the university won't be able to urge students to participate in this technological transformation"
QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching materials?

A- "I am using the Internet to obtain professional instrument about a year ago, this was one of my barrier purposes of Internet use"
QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing teaching materials?

A- "I have the Internet anywhere, but I did not used it in preparing teaching materials ".

DEE3

:The interview questions with nature of Internet usage

:Section A : Use of the Internet for communicating with students

?**QUESTION A1 -** When did you start using the Internet for contacting students

A- "Use of the Internet by students in public places is difficult even inside the university"
?**QUESTION A2 -** Where do you use the Internet for contacting students

A- "In the university, we look forward to literate people to improve the Internet use and
encourage them to interact virtually"
?**QUESTION A3 -** Which Internet applications or tools do you use for contacting students
Correspondence with postgraduate students is very active; so, we use many "applications in
order to discuss different issues and exchange opinions"
?**QUESTION A4 -** What obstacles do you face in using the Internet for contacting students

A- I do not support using private emails for communicating with students. We must use" the
university emails; but it is weak and so slow"
QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting
?students

A- I contact my students in Arabic. However, I use English to deal with different issues"
more effectively and indeed with English"

QUESTION B1- When did you start using the Internet for reviewing literature and writing
?papers

A- ".I started using online for writing and searching purposes in 2009"
?**QUESTION B2-** Where do you use the Internet for reviewing literature for writing papers

A- The Internet is a favourite tool to chase all related issue to participate in scientific"
conferences"
QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for
?writing papers

A- The Internet is a favourite tool to chase all related issue to participate in scientific"
conferences"
QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature
?and writing papers

A- It is different when you use the Internet in Arabic because we have limited availability"
of information from sources"
QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing
?literature for writing papers

A- "Use of Arabic web pages only retrieves poor out-dated information"

?**QUESTION C1 -** When did you start using the Internet for preparing teaching materials

A- In my course students are required to submit three assignments, so I can send them"
my comments and feedback"
?**QUESTION C2 -** Where do you use the Internet for preparing teaching materials

A- People understand that their traditional documents are more secure than the electronic"
"stuff that could be lost easily at any time due to the lack of adequate protective systems
QUESTION C3 - How successful is your use of the Internet for preparing teaching materials?

A- We have to commit all educators to make their teaching materials available online
"through the university electronic system"
QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching
materials?

A-

"Use of Arabic web pages only retrieves poor out-dated information"

QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing teaching materials?

A- "The Internet facilitates translating from English into Arabic was difficult the words and bot clerafication"

DEE4

The interview questions with nature of Internet usage:

<u>Section A : Use of the Internet for communicating with students:</u>

QUESTION A1 - When did you start using the Internet for contacting students?

A- "I believe that the use of the Internet in respect of dealing with students was very successful because it's a very appropriate communication means"
QUESTION A2 - Where do you use the Internet for contacting students?

A- "In respect of dealing with students it was very successful, because it's a very convenient communication means"
QUESTION A3 - Which Internet applications or tools do you use for contacting students?

A- "In my personal view, the most difficult thing that we have is to make this type of contacts official"
QUESTION A4 - What obstacles do you face in using the Internet for contacting students?

A- "There are some female professors who do not like to upload their photos or full contact details into the university website"
QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting students?

A- "We use the Arabic language in respect of contacting students because it's the official language but for any other purposes I don't mind using English".

<u>Section B : Use of the Internet for reviewing literature and writing papers:</u>

QUESTION B1- When did you start using the Internet for reviewing literature and writing papers?

A- " Use of the Internet for reviewing the literature for writing papers began at the start of my professional career in 2004".

QUESTION B2 - Where do you use the Internet for reviewing literature for writing papers?

A- "I believe being open to the university society members and explaining what we do helped us to make some progress in use of the Internet in the university"
QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for writing papers?

A- "I have my own private website which I do not want my students to come across... It includes some private contents that I do not think my students should discover"
QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature

?and writing papers

,Unfortunately, many departments of the university have no active emails. Therefore
"we do not correspond in respect of managing the academic work

QUESTION B5 - How does the use of Arabic influence your use of the Internet for reviewing
?literature for writing papers

A- In addition to obtaining papers, we have become reviewers".""

[:Section C : Use of the Internet for preparing teaching materials](#)

QUESTION C1 - When did you start using the Internet for preparing teaching materials?

A- ".I started the actual use of the Internet in respect of research and preparing teaching materials in 2011"
QUESTION C2 - Where do you use the Internet for preparing teaching materials?

A- "Without the Internet it would become difficult to deliver recent scientific materials to students or to
"interact with them in different aspects
QUESTION C3 - How successful is your use of the Internet for preparing teaching materials?

A- "At present, we register students, manage their study times, guide groups and show the
"results through the electronic system

QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching
?materials

A- We have a problem with compatibility on the university level

QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing
?teaching materials

A- "There is a great quantity of scientific materials on the Internet. So we obtain scientific
"books and articles for free in both Arabic and the English language

DEE5

:The interview questions with nature of Internet usage

[:Section A : Use of the Internet for communicating with students](#)

QUESTION A1 - When did you start using the Internet for contacting students?

A- "I use the Internet in different places: sometimes in the university and sometimes in
"my home
QUESTION A2 - Where do you use the Internet for contacting students?

A- ."We don't have enough places for the students use of internet access points"
QUESTION A3 - Which Internet applications or tools do you use for contacting students?

A- "If you have got basic computer skills, then the use of the Internet becomes very easy"
QUESTION A4 - What obstacles do you face in using the Internet for contacting students?

A- .We had a problem at the beginning with introducing the faculty software to academics"
"Actually, we were not trained to use the new electronic system effectively

QUESTION A5 - How does the use of Arabic influence the use of the Internet for contacting students?

A- "Use of the Arabic language is associated with dealing with students and administrative or formal issues, but for seeking information I use both Arabic and the English language"

Section B : Use of the Internet for reviewing literature and writing papers:

QUESTION B1 - When did you start using the Internet for reviewing literature and writing papers?

A- "Often, I don't use the Internet for contacting my students because we don't have enough places for the students use"

QUESTION B2 - Where do you use the Internet for reviewing literature for writing papers?

A- "Exploring the Internet materials changes the way we think, enhance our knowledge and improves speaking and lecture delivery styles"

QUESTION B3- Which Internet websites or tools do you use for reviewing literature for writing papers?

A- "Usually we search the Internet for references to support our arguments. However, a large proportion of available books in the library are associated with the curricula with limited frames. Furthermore, the library doesn't update its collection continuously"

QUESTION B4- What obstacles do you face in using the Internet for reviewing literature and writing papers?

A- "Through the college electronic system... students receive all related information to their courses such as: declarations, announcements and results"

QUESTION B5- How does the use of Arabic influence your use of the Internet for reviewing literature for writing papers?

A- "Use of the Arabic language but the effect ,its not good because I need to translate materials from English or German into Arabic before sending them to students".

Section C : Use of the Internet for preparing teaching materials:

QUESTION C1 - When did you start using the Internet for preparing teaching materials?

A- "The Internet is very helpful in education because it provides all the information you need"

QUESTION C2 - Where do you use the Internet for preparing teaching materials?

A- "Actually, I have the Internet anywhere, but I did not used it in preparing teaching materials"

QUESTION C3 - How successful is your use of the Internet for preparing teaching materials?

A- "I prefer the stable form of books rather than any other media (electronic) forms"

QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching materials?

A- "We have a problem with people who are accustomed to traditional teaching ways"

QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing teaching materials?

A- "Use of the Arabic language duplicates our work because I need to translate materials"

".from English or German into Arabic before sending them to students

:The interview questions with nature of Internet usage

?**QUESTION A1 -** When did you start using the Internet for contacting students

A- .I started using the Internet to communicate with students only and half years ago"
However, for contacting postgraduates it was used many years ago
?**QUESTION A2 -** Where do you use the Internet for contacting students

A- I use the Internet to communicate with undergraduates only during study times, while"
"I am in my office, but for the postgraduates the channel is usually open for all the time
?**QUESTION A3 -** Which Internet applications or tools do you use for contacting students

A- ,Almost of academics upload their contact details onto the faculty electronic gate"
"including myself even though of the long time of it
?**QUESTION A4 -** What obstacles do you face in using the Internet for contacting students

A- I use the Arabic language to communicate with undergraduate students but I also use"
"English to communicate with my postgraduates and colleagues
QUESTION A5 - How does the use of Arabic influence the use of the Internet for
contacting ?students

A- I use the Arabic language to communicate with undergraduate students but I also use
"English to communicate with my postgraduates and colleagues

QUESTION B1 - When did you start using the Internet for reviewing literature and writing
?papers

A- I have started in using the Internet since it is access in our department it was from
the" ."2012
?**QUESTION B2 -** Where do you use the Internet for reviewing literature for writing papers

A- I don't use the Internet frequently for teaching preparation and serash; it's not my"
"fundamental target at all
QUESTION B3 - Which Internet websites or tools do you use for reviewing literature for
?writing papers

A- We found that students are interested in dealing with other communicational tools
such"
".as forums and Facebook groups and not interested for the papers
QUESTION B4 - What obstacles do you face in using the Internet for reviewing literature
?and writing papers

A- Many information resources obtained from the Internet did not address the issues in"
"depth
QUESTION B5 - How does the use of Arabic influence your use of the Internet for
reviewing
?literature for writing papers

A- "I use of Arabic web pages only retrieves poor out-dated information

?**QUESTION C1 -** When did you start using the Internet for preparing teaching materials

A- "I collect useful information, check new thoughts and develop my teaching techniques..."
?**QUESTION C2 -** Where do you use the Internet for preparing teaching materials

A- I am not keen to use the Internet for teaching preparation because of the credibility of"
"information and I have got all required materials and references in my home library
?**QUESTION C3 -** How successful is your use of the Internet for preparing teaching materials

A- The use of the Internet for preparing teaching materials is less successful in comparison"
"with its use for contacting students or reviewing the literature for writing papers
QUESTION C4 - What obstacles do you face in use of the Internet for preparing teaching ?materials

A- During teaching, I can't manage technical problems such as slowness and interruption"
"of the Internet
QUESTION C5 - How does the use of Arabic influence your use of the Internet for preparing
?teaching materials

A- There is a great quantity of scientific materials on the Internet. So we obtain scientific books and articles
"for free in both Arabic and the English language