UNIVERSITY OF NAIROBI

SCHOOL OF COMPUTING AND INFORMATICS

E-learning Readiness Assessment: A Case of Higher Education Institutions in Kabul, Afghanistan.

BY

Muga, Tom Ogejo

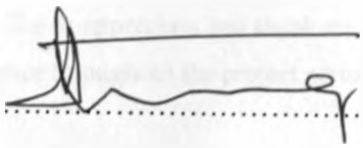
P56/P/8075/2000

Supervisor
Professor Anthony J. Rodrigues
June 2009

Submitted in partial fulfillment of the requirements of the Master of Science in Information Systems

DECLARATION

This project as presented in this report, is my original work and has not been presented for any other University Degree Award.

Signed 

Date JULY 17, 2009

Tom Muga Ogejo

This project has been submitted as part fulfillment of requirements for the Masters of Science in Information Systems of the University of Nairobi with my approval as the University Supervisor.

Signed Anthony J Rodrigues

Date July 20, 2009.

Professor Anthony J. Rodrigues

COPYRIGHT

ACKNOWLEDGEMENT

I would like to appreciate and thank my supervisor, Professor Anthony J. Rodrigues for his guidance throughout the project period.

I would also like to thank University of Nairobi, School of Computing and Informatics' Management and Academic staff for all support provided.

Special thanks to Tayo Fagbenro (of Strategic Impact Consulting) and his team in Kabul, Afghanistan who helped with distribution and enumeration of questionnaires.

I also appreciate the Education Team Leader, USAID Afghanistan for making it possible to have interviews with her project staff and for facilitating interviews with other stakeholders in Higher Education.

I would not forget the encouragement and unwavering support of my dear wife Monica Muga during the course of this work. My elder brother Professor Jactone Arogo (Virginia Tech University, USA) also played a great role in encouraging me to finish this work.

Last but not least, I wish to thank all the respondents in Kabul, Afghanistan who participated in the survey and key informant interviews; I owe it all to you.

ABSTRACT

E-learning has helped many nations to generate, disseminate, use, and expand internet based learning among citizens for the benefit of society and the economy. While faced with the challenge caused by many years of wars and conflict, Afghanistan is harnessing E-learning techniques to expand education and training opportunities in the face of lack of infrastructure and very low literacy levels. Whereas a number of E-learning initiatives exist in the higher education sector, there has not been an attempt to carry out a country E-learning readiness assessment.

This project presents a first step towards addressing this need by identifying factors that support viability of E-learning; measuring various stakeholders' perceptions of E-learning readiness, and the impact of factors such as gender and education levels on E-learning perceptions; and the relationships that exist between technology and educational system.

A survey of three-hundred and fifty users of structured E-learning in four public Universities in Kabul has been done in this study. The results indicate an overwhelming majority having a positive perception of country E-learning readiness. In addition, the study results show that there is no significant relationship between gender, and level of education on E-learning readiness perception. However, the study results indicate that there is a very strong linkage between the investment in ICT infrastructure for education and the resultant impacts from the E-learning educational system.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF TABLES (contd)

LIST OF ABBREVIATIONS

AIBD:	Asia Pacific Institute of Broadcasting Development
ANGeL:	Afghanistan Next Generation E-learning
ANOVA:	Analysis of Variance
BIT:	Basic IT Training
CCNA:	Certified CISCO Network Administrator
CD-ROM:	Compaq Disc Read Only Memory
CNAP:	CISCO Networking Academy Program
ELRAIA:	E-Learning Readiness Assessment in Afghanistan
ERTV:	Educational Radio and TV
IBM:	International Business Machines
ICT:	Information and Communications Technology
IDC:	International Data Corporation
GOA:	Government of Afghanistan
IRoA:	Islamic Republic of Afghanistan
ISP:	Internet Service Provider
IT:	Information Technology
ITCIT:	Institute of Telecommunications and Information Technology
LAN:	Local Area Network
MoE:	Ministry of Education
NATO:	North Atlantic Trade Organization
NESP:	National Education Strategic Plan
RTA:	Radio Television Afghanistan
SPO:	Structure Process Outcome
SPSS:	Statistical Package for the Social Sciences
TIMSS:	Themes In International Maths and Science
UNDP:	United Nations Development Program
UNESCO:	United Nations Educational Scientific and Cultural Organization
US:	United States
USAID:	United States Agency for International Development
WAN:	Wide Area Network
WSU:	Washington State University

CHAPTER 1: INTRODUCTION

1.1 Background to the problem

1.1.1 Overview of E-learning

a) Definition

Defined most broadly, E-Learning covers a wide set of applications and processes, such as web-based learning, computer-based learning, virtual classrooms, and digital collaboration. It includes the delivery of content and E-Books via Internet, intranet/extranet (LAN/WAN), satellite broadcast, and CD-ROM, and uses multimedia such as audio and videotape, interactive TV, narration, pictures and graphics.
(Commission on Technology and Adult Learning, 2001).

E-learning is an example of the use of ICT-supported teaching and learning methods whose use in educational institutions is gaining momentum with the passage of time (Omwenga, et al June 2004).

b) Global E-learning market

According to the International Data Corporation (IDC), the global market for E-learning grew to reach $23B by 2004 (Barron, 2002). Gartner Group estimated that 42 percent of all business E-learning initiatives in the U.S. would be directed at consumers by 2003, up from 7 percent in 2002 (Shea-Shultz & Fogarty, 2002). Echoing this prediction, Gilbert and Jones (2001) stated that in 2003, E-learning comprised around 40 percent of all corporate training delivery methods. The E-learning market numbers in Europe also show constant growth. According to recent studies, the European E-learning market grew to around 120% in 2002, and continues to grow, although it slowed in 2002 compared with 2001 (Massy et al., 2002). The corporate E-learning market in Asia/Pacific countries was worth almost $233 million by 2005, growing by 25 percent. However, some decreases in this growth figure are expected in the Asia/Pacific region due to the influence of their softening economy (Sim, 2001). These growth figures reveal that the number of E-learning initiatives is steadily increasing.

c)Why E-learning?

There are several reasons behind this increase in E-learning implementations. One of the most significant reason is related to the cost of training. The literature abounds with reports about how much money companies save by implementing E-learning. As an example, Shea-Shultz and Fogarty (2002) cite that IBM's E-learning initiative Basic Blue helped the company save $16 million in 2000 and PricewaterhouseCoopers reduced the cost of training per person by approximately 87 percent through its E-learning initiative. The same authors state that "E-learning is saving 33 to 50 percent from the cost of training while cutting 50 percent off the time invested and allowing better results." In addition to cost benefits, organizations prefer E-learning for its promises to: increase employee retention; rapidly develop, deploy and update courses; provide effective training, available anytime and anywhere (Minton, 2000); boost worker productivity; broaden training opportunities; stay competitive; improve motivation and morale; and implement strategic initiatives (Bork, 2002).

In the Education market, E-Learning helps college and university students to reach their goals. It also benefits faculty and staff - from elementary schools to universities. Educational systems around the world are under increasing pressure to use the new information and communication technologies (ICT) to teach students the knowledge and skills they need in the 21st century. Within the past decade, the new ICT tools have fundamentally changed the way people communicate and do business. They also have the potential to transform the nature of education: where and how learning takes place and the roles of students and teachers in the learning process. (Omwenga et al, June 2004)

1.2 Situation analysis in Afghanistan

Afghanistan is one of the poorest countries in the world, and it is a highly fragmented society where the authority of the Islamic Republic of Afghanistan (IRoA) is still contested. Continuation of recent positive developments is subject to serious risks – political, security, institutional, macroeconomic, climatic, and drug-related. Years of civil war, compounded by Taliban rule and the worst drought in memory, have devastated

Afghanistan. In 2001, when the Taliban were forced out of power, half of Afghanistan's people lived in absolute poverty and were unemployed. Since 2002, the IRoA and the international community have focused on supporting the establishment of national government structures, education and health systems, civil society, and the private sector economy in Afghanistan. (USAID, 2007)

1.2.1 E-learning interventions in Education in Afghanistan

In higher education, Afghanistan is harnessing E-learning techniques to expand education and training opportunities in the face of challenges like lack of infrastructure and low literacy levels. E-learning is being used for a range of formal and informal education needs. In the context of Afghanistan, radio serves as an effective means for delivering educational broadcasts since it can reach remote populations and people who are illiterate. Radio programs are now being used to broadcast farming tips, civic education, legal information etc. (Development Gateway Foundation, 2006)

The following are some ongoing E-learning initiatives in Afghanistan:

- UNESCO Educational Radio and TV
- Afghan eQuality Alliance
- Cisco Networking Academy Program Afghanistan

UNESCO Educational and Radio TV

United Nations Educational, Scientific and Cultural Organization (UNESCO) has equipped the national Educational and Radio TV (ERTV) Centre with furniture, internet access and 40 computers linked through a Local Area Network (LAN). Some digital television equipment has also been provided, with complete radio and television studios to follow shortly. Some 70 staff members of the ERTV Centre have now relocated to the building from their former offices in Radio-Television Afghanistan (RTA) and are already producing a range of new educational programming. Under the project, UNESCO has already provided three months of intensive training in fields such as TV and radio techniques, use of digital equipment, program production, English language proficiency and computer literacy. In the next phase of the project, ten ERTV staff members will

receive advanced training at the Asia-Pacific Institute for Broadcasting Development (AIBD) in Kuala Lumpur, Malaysia.(UNESCO, 2004)

Afghan eQuality Alliance:

This is a partnership between United States Agency for International Development (USAID) and Kabul University with the following objectives:

1) To contribute to rebuilding Afghanistan by creating conditions for people to live secure lives and by laying the foundations for the formation of sustainable human capital.
2) To increase the number of Afghan professionals, students, and citizens who are ICT capable.

Cisco Networking Academy Program Afghanistan (CNAP)

CNAP is a comprehensive E-learning program that has been launched in approximately 10,000 educational institutions in over 150 countries worldwide. Through a partnership among United Nations Development program (UNDP), Cisco Systems, and the Ministry of Communications; CNAP was introduced and initiated in Kabul in 2002. Due to the programs success, USAID Afghanistan joined the partnership in 2004 to expand the program to secondary provinces to introduce new curricular, and to strengthen the existing Networking Academies in the areas of sustainability, workforce development and gender.

1.3 The problem statement

Afghanistan has one of the highest illiteracy rates in the world. In rural areas, where three-fourths of all Afghans live, 90% of the women and 63% of the men are illiterate. Nearly three-quarters of Afghans over the age of 15 cannot read or write. Under the Taliban, girls were not allowed to go to school and many boys received religious education in lieu of academics. The legacy of prohibiting women to work and men fighting wars meant a lack of technical job skills for the majority of the population. The implications of this lack of education can be felt in all domains of life. For example,

Afghans lacked access to information about good health practices; and most of the country's judges do not have more than high school education.

Going by the above problem, how can the high level of illiteracy be mitigated in a country that is in a reconstruction phase having come out of several years of war? Can E-learning be successfully implemented in this country where even majority of teachers and administrators of schools are computer illiterate?

While faced with these challenges, the IRoA in its "ICT in Education Policy" recognizes that "in an increasingly technology oriented and globalizing world, the use of ICT has become a critical factor in enabling more people to gain access to quality education, which in turn ensures that a country's workforce is skilled and prepared to meet the challenges of development." (NESP, 2006)

IRoA further recognizes that the establishment of ICT infrastructure in Afghanistan is therefore essential to promoting education and its subsequent benefits. Together with the purchase and installation of ICT systems in education, E-learning – which has proven to be a highly cost effectivel investment for developing countries worldwide – will be facilitated.

In order to reinforce the IRoA commitment, the ICT in Education sector strategy has outlined the following as desired outcomes to be achieved in the area of enhancing E-learning.

- By end of 2008, unified Curriculum and regulatory framework for the private ICT training centers will be drafted in cooperation with Ministry of Education.
- By end of 2009, all schools should have access to the internet and multimedia resources, together with basic curricula that includes browsing, searching and messaging.
- By end of 2010, digital literacy must be adopted as one of the mandatory basic skills of all young Afghans. The internet and multimedia resources must be introduced in schools and education must be adapted to the digital age.

- By end of 2018 all pupils should be digitally literate by the time they leave school.

The fore-mentioned factors warrant a study into establishing the country's readiness for implementation of E-learning.

1.4 Research Questions

This study is intended to answer the question: "Are Higher Education Institutions in Afghanistan ready for E-learning?"

Specifically the study addresses the following specific questions:

1. What factors exist within Afghanistan higher education systems that support the viability of E-Learning?
2. What is the perception of various stakeholders on the level of E-learning readiness in Afghanistan higher Education Institutions?
3. What is the impact of gender and education level on perceptions of E-learning in higher education institutions?
4. To what extent have the following factors affected E-learning? Technology and infrastructure, content and content management, educational policy.

1.5 Research Hypotheses:

In this research, it is hypothesized that:

H1: Respondents who have never had interaction with E-learning will report a negative perception towards E-learning readiness in Afghanistan

H2: There will be no statistically significant difference in perception of E-learning readiness in Afghanistan Higher Education Institutions based on gender.

H3: There is a positive relationship between level of education and E-learning readiness perception in Afghanistan

H4: High investments in technology and infrastructure affect the outcomes of E-learning in Afghanistan.

1.6 Justification and Significance of the study

With time the establishment of E-learning in post-war Afghanistan can facilitate access to education in all sectors of the society. Distance learning - which has proven to be highly cost-effective investment for developing countries worldwide – and in-service training to improve skills and knowledge of the existing labor force, will be facilitated.

The study will help provide important data to the IRoA, International Community (Donors), local and foreign investors, and anyone interested in enhancing Education Afghanistan.

This study will help provide useful information for any researchers in the area of post-war reconstruction.

1.7 Scope and limitations of the study

Due to the wide variance of the educational sector in Afghanistan, coupled with security and logistic challenges; the study limits the sample frame to higher learning institutions within Kabul, the capital city of Afghanistan.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter will pull together, integrate, and summarize relevant literature the researcher gathered in the area of E-learning readiness assessment. It presents an overview of the literature on some studies that have been done in relation to the research questions of the study and helps to better define the research problem.

2.1.1 Definition of E-learning Phenomenon:

The emergence of E-learning has created a new platform for the delivery of training, it is, a phenomenon, and the impact of this technology will create opportunities that will enhance and transform the learning experience for both student and teacher (Sloman 2001).

It is believed to be a new medium "involving the delivery and administration of learning opportunities and support via computer, networked and web-based technology, to help individual performance and development" (Pollard & Hillage 2001). Fry (2000) supports this and believes that the focus of E-learning is primarily channeled via "networked interactivity and a range of other knowledge collection and distribution technologies". One of the problems with appraising E-learning however, is that it is eclectic and one can learn from many different electronic mediums. For example, we can learn from surfing the web, from online courses, from participating in an online discussion forum or from being coached or mentored via e-mail. Nevertheless, there is one common thread running through all these forms of E-learning – they all offer the possibility of learning from information exchanged electronically (Honey, 2001). Whitlock (2000) suggests that the best way forward is not to search for the definitive definition but to apply E-learning as an 'umbrella term' that encompasses all forms of electronic delivery, whether online or via other electronic mediums such as CD-ROM

2.1.2 Readiness:

Readiness is defined as being "prepared mentally or physically for some experience or action" (Webster's New Collegiate Dictionary). Borotis & Poulymenakou (2004) define E-learning readiness as "the mental or physical preparedness of an organization for some E-learning experience or action". E-learning readiness assessment helps an organization to design E-learning strategies comprehensively and to implement its ICT goals effectively (Kaur & Abas, 2004).

In summary, E-learning readiness assessment provides key information to organizations to supply solutions which can cater to the specific needs of each learning group

E-learning readiness is a nation's ability to generate, disseminate, use and expand internet-based learning among its citizens for the benefit of society and the economy (McConnell International, 2000).

2.2 E-learning Readiness Evaluation Models:

Evaluation of E-learning has become a widely researched area. Literature is replete with numerous models on evaluating E-learning. This section examines some of these models that were found relevant to the study.

While there is general agreement about the importance of evaluation in information systems projects, some authors disagree on the detailed role and scope of the activity, and various terms have been used to distinguish between different types of evaluation. For most investigators, evaluation has meant a concentration on the technical aspects of an information system and its immediate environment, but it has also at times been used as an umbrella term covering a broader process of investigation into social, technical, organizational and other aspects that might affect the operation and outcomes of an information system innovation (Rodriguez, 2004).

According to Chapnick (2000) before implementing E-learning programs, organizations need to expand the usual needs assessment process by creating a high-level requirements document that includes:

1) Objectives (macro organizational objectives and micro target learner population objectives);

2) an E-learning readiness score;

3) a list of advantages and potential obstacles to E-learning adoption; and

4) a list of possible E-learning configurations

Chapnick has designed a model for measuring the E-learning readiness of an organization by answering the questions:

a) Can we do this?

b) If we can do this, how are we going to do it? and

c) What are the outcomes and how do we measure them?

Her proposed model groups different factors into eight categories:

- Psychological readiness. This factor considers the individual's state of mind as it impacts the outcome of the E-learning initiative. This is considered one of the most important factors and has the highest possibility of sabotaging the implementation process.
- Sociological readiness. This factor considers the interpersonal aspects of the environment in which the program will implemented.
- Environmental readiness. This factor considers the large-scale forces operating on the stakeholders both inside and outside the organization.
- Human resource readiness. This factor considers the availability and design of the human-support system.
- Financial readiness. This factor considers the budget size and allocation process.
- Technological skill (aptitude) readiness. This factor considers observable and measurable technical competencies.
- Equipment readiness. This factor considers the question of the proper equipment possession.
- Content readiness. This factor considers the subject matter and goals of the instruction.

Chapnick provides multiple choices for each question and expects managers to select only one response that represents the situation of their respective companies. Each response has a point value indicated in parenthesis at the end of each choice. The managers are expected to add up the points for each section after responding to all the questions in the section. In addition, the managers are asked to combine the points for

each section to find out the cumulative score. According to Chapnick's model, the lower the grade the users get the more ready their companies are for E-learning. The model helps managers not only assess on what level their companies are ready for E-learning, but also reveals in what areas their companies need improvement and in which areas it is successful.

Singapore's Ministry of Education (MOE) found Chapnick's model especially useful for school principals and heads of department planning to introduce E-learning in their school (Ministry of Education Singapore, 2004). One of the major drawbacks of this model for teachers in schools, however, is that it is designed to measure the readiness of using E-learning in business organizations and does not fit neatly into the school environment.

Building on Chapnick's model, Kaur and Abas (2004) designed a model for measuring the E-learning readiness of the Open University Malaysia. Their model consists of eight constructs: learner, management, personnel, content, technical, environmental, cultural and financial readiness.

Taking a slightly different approach, Haney (2002) suggests that managers should ask themselves 70 questions for assessing their organizational readiness. She classifies these questions into 7 categories: (1) Human resources; (2) learning management system; (3) learners; (4) content; (5) information technology; (6) finance; and (7) vendor. Haney's instrument is sort of a checklist that requires managers to choose levels of importance for each of the questions. A manager should decide whether the question is "not very", "moderate" or "very" important for her/his company. However, the questions under the last three categories, which are information technology, finance, and vendor, have already been checked as "very" important because Haney believes that these items should always be considered as very important in any E-learning assessment process.

Although the above E-learning readiness instruments are often cited in the literature, similar ones can also be found, such as Anderson (2002), Broadbent (2001), Minton

(2000), so forth. Any of these instruments may seem to be used by any company to assess its readiness for E-learning. According to the results of the analyses, companies can decide to implement E-learning or determine the areas in which they need to improve in order to be able to execute a successful E-learning initiative.

However, Rogers (2003) points out that every system (i.e., organization, culture, country, individual) has its own norms that can be effective in diffusing an innovation in its system. From this perspective, it can be said that these instruments may not work for organizations of other countries. The human resources development field in many of the emerging countries as well as some developed ones has only recently shown advancement, and as a result, most of the terms and strategies for implementation that are widely used in western companies have not been adopted as yet.

In addition, most of the existing e-readiness instruments were not developed for use in primary or secondary schools – the majority of these having been constructed for business organizations, universities or higher education institutions.

As E-learning is being studied in higher education system in Afghanistan, there is a clear need to consider a framework for E-learning readiness which is specifically designed for the needs of a country currently in the phase of reconstruction.

Gender issues are very critical in Afghanistan; as pointed out in Chapter 1, over the past seven years, Afghanistan has seen an increase in the empowerment of women as active members of their communities. Women make up 30% of the student body of the American University of Afghanistan, and 35% of the six million students enrolled in primary and secondary schools are girls. (NESP, 2006)

An additional factor to be taken into consideration is a body of research findings which link gender differences to levels of computer acceptance (Yuen & Ma, 2002; Russell & Bradley, 1997) – an issue which is also relevant to teachers' E-learning readiness. In his research into 462 middle and high school students, Young (2000) found significant gender differences in attitudes to computers. The male domain scale showed that boys were more likely to have claimed computers as a male area. Russell and Bradley (1997)

found that male teachers reported significantly greater confidence with computers than did female teachers; and recommended that the design of teacher professional development should take gender differences into account, allowing for the particular needs of female teachers.

As can be seen from the foregoing, the E-learning readiness assessment instruments readily available in the field generally ask questions that include some terms and implementations that are not known or are not being used by organizations in other countries. Learning style, for example, is a term that has only recently caught the attention of human resources departments of the companies. Indeed, the literature in emerging countries such as Turkey on determining employees' learning styles is almost non-existent. Using an E-learning readiness assessment tool, a question concerning the learning styles of a company's employees may not have an answer. Moreover, users (managers) may not understand, or even misunderstand, the question because they do not have a context in which to place it. Almost all the available assessment instruments contain items related to learning style or similar terms/implementations that may influence effectiveness of the assessment processes and results.

Therefore, the results of the assessment may very well be invalid for respondents from other countries than western. Studies on impact of culture and context in E-learning (e.g., Gunawardena, et al, 2001; Le Boterf, 1994; McIsaac, 2002) can also be shown as a base for this observation.

Consequently, there are several unanswered questions in the field of E-learning literature including: "How can companies in emerging countries assess their organizational readiness for E-learning?" and "What are the factors that must be taken into consideration when assessing the organizational readiness of companies in these countries?" A look at some specific examples may help answer some of these questions.

2.3 Selected E-learning Readiness Case Studies

2.3.1 The case of Hong Kong

From 1998 to 2003 the Hong Kong government invested HK$5 billion into a five-year IT strategic plan for primary and secondary schools, which provided a solid foundation for further changes. At the end of the five-year period the result was all primary and secondary schools in Hong Kong having 91 and 247 networked computers respectively. Moreover, all schools have broadband Internet connections, at speeds ranging from 1.5 to 10 Mbps. Teachers in every primary and secondary school in Hong Kong had received 18 hours of basic IT training (BIT), with 75% of school teachers receiving a further 30 hours of intermediate IT training (IIT); and 25% of teachers receiving an additional 30 hours of IT training (Upper Intermediate; UIT). In summary, although the lion's share of the investment went to IT infrastructure and on teacher training, the expected change / paradigm shift in pedagogy was not obvious (CITE, 2003; para. 42 & 43).

Given the significant investment of government resources and IT implementation into schools in Hong Kong, the educational establishment (as well as the teachers themselves) urgently need a sound and thoroughly validated model to assist in the integration of E-learning in schools.

The rapid growth and evolution of ICT and learning technologies makes it imperative that we truly understand what is needed, so that investment into E-learning is as cost-effective and appropriate as possible.

The purpose of this research was therefore to discover just how ready Hong Kong's primary and secondary school teachers were:

- To use new technology in the classroom;
- To integrate E-learning into their teaching; and
- To establish what factors are influencing their readiness.

This project, while obviously focused on the Hong Kong experience of school-level uptake of E-learning, is also of potential benefit to other countries within Asia (and, possibly, even more widely), as they explore the use of the E-learning technology in new teaching and learning environments. Together with other research (Kaur & Abas, 2004; Ya'acob, Nor & Azman, 2005) these results should provide a clearer and better picture of how Asian countries are responding to the E-learning challenge.

2.3.2 The case of Egypt

In Beckstrom, et al (2006), eight "Critical Success Factors" were identified as being integral to the future of E-learning in Egypt. Those included:

- Shared Vision
- Leadership Support
- Technology/infrastructure
- Content must be available
- Acceptance/embracing of E-learning by stakeholders
- Economically funded and/or affordable
- Regulatory environment supportive and legal systems protective of E-learning processes
- Sustainability.

Findings from the E-learning Readiness Assessment identified the emerging priorities for E-learning in Egypt, barriers to E-learning implementation, and examples of E-learning in Egypt, including projects, training, and tools. Based on the above, a series of conclusions were presented. The main conclusion was:

> ***To answer the initial question – Is Egypt ready for large-scale eLearning deployment? The answer is a qualified "yes" – E-learning is sorely needed, it's coming, and Egypt can prepare itself to make it easy and effective, or hard and inefficient.***

The following emerged as some of the priorities and driving factors for E-learning in Egypt identified in this study:

- The ratio of students to teachers throughout the education system is very high eLearning is perceived as a possible solution to address this symptom.
- Although there are many people who have graduated from Egyptian tertiary education system, they are unable to find jobs in their chosen fields, resulting in many individuals being unemployed and underemployed. It is felt that E-learning may help re-tool these individuals for new jobs (especially in critical fields).
- From a business standpoint, Egypt wants to become an exporter of E-learning technology, especially content in Arabic.
- There is a desire to improve the quality of instruction, especially among elementary and preparatory school teachers and to achieve a strong TIMSS (Themes in International Math and Science) ranking.

2.4 E-learning in Afghanistan:

In Afghanistan higher education system, there are currently two structured E-learning initiatives, these are:

1. Afghanistan Next Generation eLearning (ANGeL) implemented by Afghan eQuality Alliances.
2. CISCO Networking Academies Program (CNAP) implemented by UDNP.

2.4.1 Afghan eQuality Alliances

Implemented by Washington State University (WSU), the Afghan eQuality Alliances is made up of leaders and stakeholders who work together towards a common goal: Afghans developing capacity in higher education for sustainable nation building. By complementing each other's strengths, the institutions and individuals achieve results beyond what any single organization or sector could realize alone. Afghan –led alliances include partners from the US, India, japan, Europe, and Africa.

The goal is equal access to quality education and e-education resources.

Three key precepts are:

1. Alliances: Reciprocal relationships that are mutually beneficial, two way knowledge exchanges that achieve results beyond what any single organization or sector could realize alone.
2. eQuality. Equal access to quality education and e-educational resources.
3. Afghan. Emphasis on Afghan leadership in higher education in nation building with a supportive role played by American and other partner institutions.

Key outcomes:

1. Improved capacity of the leadership and management of 19 higher education institutions to meet standards of excellence and quality assurance.

2. Improved capacity of 5 Kabul-based and 4 regional higher education institutions to sustain services of an Afghans Next Generation eLearning (ANGeL) Center for Teaching and Learning.

3. Improved capacity (knowledge, attitude and skills) of lecturers to upgrade their curriculum, course syllabus, and online content in key academic areas.

4. Strengthened capacity of Kabul University and the Civil Service Institute to build capacity in public policy and administration.

Project Summary:

The project goal is "equal access to quality education and e-education resources." To achieve this, one desired outcome is improved capacity of 5 Kabul-based and 4 regional higher education institutions to sustain services of an Afghans Next Generation E-learning (ANGeL) Center for Teaching and Learning. For example, the mission of the ANGeL Center at Kabul University is to strengthen teaching and learning at all levels and in all contexts at the university, and by extension, to all Afghan universities. The ANGeL Center will help lecturers to broaden their understanding of the learning process and to adopt processes to improve student learning and faculty instruction; help students with critical thinking and study skills; and; support lecturers, students and members of the broader learning community as they invest in personal and professional development. In fulfilling this mission, the ANGeL Center works with faculty lecturers on the following dimensions:

1. Teaching – Introduction of sound teaching practices at the individual, department, faculty, curricular and institutional levels.

2. Learning - Creation of a positive environment for learning in which students develop intellectually as active citizens and lifelong learners.

3. Community of Learning – Promotion of strong working relationships among students, teachers, administrators, staff, citizens at large and alliance partners from here and abroad, through an inclusive and responsive environment, wherein teaching, learning and scholarship can flourish.

4. Scholarship for Teaching and Learning – Support for practical research on how to assess and improve teaching and learning at the university level and the subsequent publication and dissemination of results.

5. Advocacy – Promotion of improved teaching and learning on the KU campus and nationwide and advocacy for individuals and groups working on teaching and learning initiatives.

These activities are implemented through ICT tools, including collaborating tools. (ANGeL, 2008)

2.4.2 CISCO Networking Academies Program (CNAP)

The CISCO Networking Academy is a comprehensive, E-learning program which provides students with the Internet technology skills essential in a global economy. The CISCO Networking Academy delivers web-based content, on-line assessment, student performance tracking, hands-on labs, instructor training and support, and preparation for industry-standard certifications.

Launched in October, 2002 in Afghanistan through a partnership between UNDP and CISCO Systems, Inc., and later USAID to form CISCO-USAID-UNDP Alliance, there are now nine (9) academies in six provinces, including a "Regional Academy" and a testing Center. The Academy curriculum covers a broad range of topics, from basic networking skills such as pulling cables to more complex concepts such as applying advanced troubles hooting tools.

CNAP in Afghanistan currently has one Regional Academy at Kabul University, and eight (8) Local Academies hosted at the Ministry of Women Affairs, the Institute of Telecommunication and Information Technology (ITCIT), Kabul Education University and Mazar-e-Sharif, Herat, Nangahar, Khost and Bamyan provinces.

All academies are equipped with computer equipment devices and internet connectivity since the training programs are online. Regional and provincial academies' instructors have been trained in IT Essentials I and II and CCNA 3&4, and back-up CCNA 1&2 instructors. (UNDP, 2007)

2.5 Evaluating E-Learning in Higher Education

In Omwenga et. al. 2004 a model for introducing E-learning in higher learning institutions has been described in detail. The model, shown below, identifies a number of key steps which include Benefits Analysis, Evaluation of Current status, Development of work plan, Implementation and Validation, and Review and Maintenance. The step, benefits analysis will spell out the reasons for deploying the technology while evaluation of the current status is the stage that will establish what exists and the appropriateness of that technology for the curriculum. Then the rest of the stages will follow possibly with iterations if some of the results of the post-implementation review are not adequate.

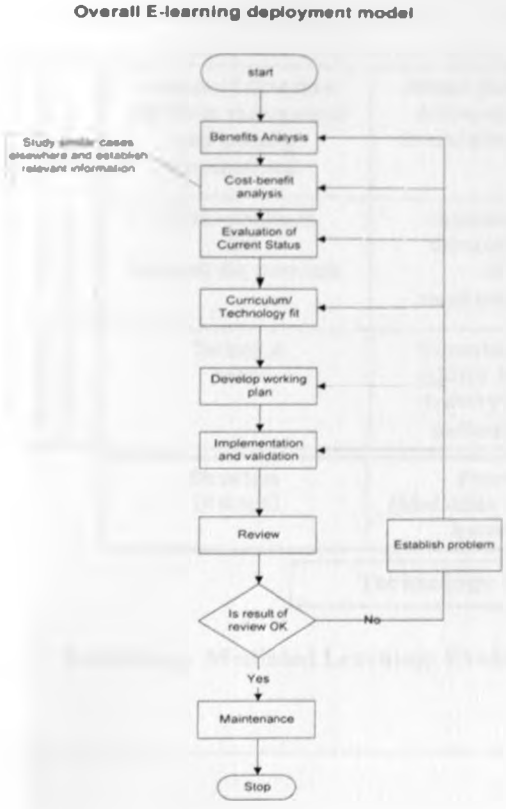


Figure 1: E-learning deployment model

2.6 Technology Mediated Learning: Evaluation Framework

This study is built on the framework recommended by Omwenga and Rodriguez (2006). The framework considers two broad issues: technology mediation and system perspective. Within these, we consider generic perspectives: in the case of technology mediation we have structure, process and outcome, while in the case of systems perspective; we have the technical, human and education levels respectively. The evaluation methodology has been used in an E-learning case study in sub-Saharan Africa and it is expected to extend further to facilitate generalization of the model in different educational settings.

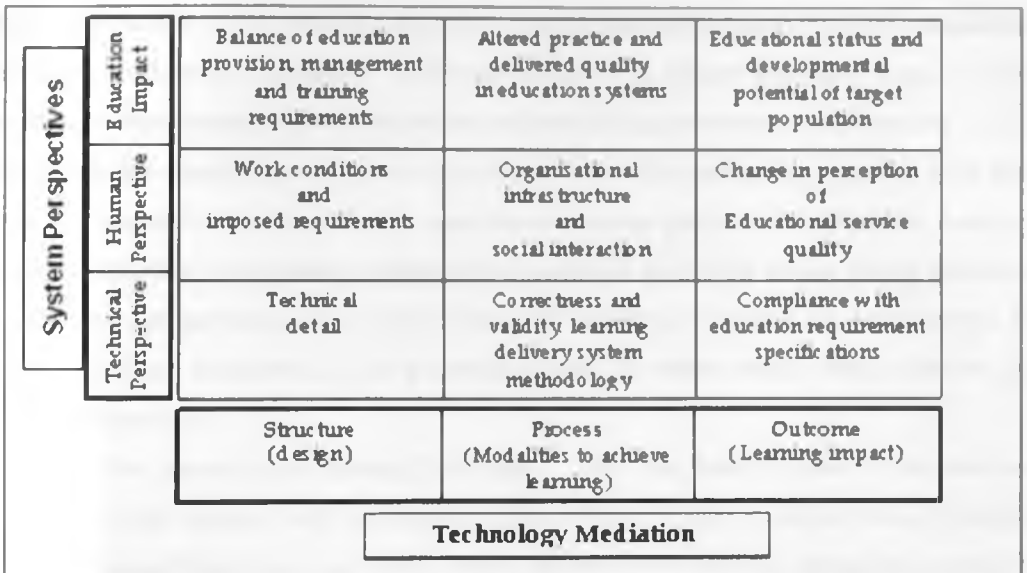


Figure 2. Technology Mediated Learning: Evaluation Framework

The model shown in Figure 2 indicates that any technology mediation for educational purposes has a structure, a process and an outcome (SPO) which can be applied at three main levels: that of the technical system functioning, human perspectives of those involved, and the overall impact on the education system. A natural diagonal between the SPO components and these levels seems apparent. Technical aspects of a system falls most directly under structure, human perspectives under process, and the education system under outcome: but by developing this model more fully and extending it into a full matrix, the approach used here sets out to capture a broader and more comprehensive state-space relationships. For example, when the structure of a system is considered in terms of its overall impact on the education system, one can appreciate the opportunities and problems that arise in implementing IT across emerging economies. Let's consider each of these matrix items (levels and components) in turn.

Level 1. The system's functioning (Technical). This has been referred to as the raw efficiency of the system itself by Rossi-Mori and Ricci in their consideration of medical expert systems (Rossi-Mori and Ricci, 1988). Broken down into the evaluation procedure, the following aspects may be considered for an E-learning system:

- Structure - what are the hardware requirements and is the software structure understandable? Does the full set of system components work together in a technical sense'? Has the system implemented pedagogic requirements that mimic classical principles of instruction?
- Process - is the method by which an instructional system brings about learner behavioural change from a state of "not knowing" to a state of "knowing" given a specific learner entry behaviour.
- Outcome – here we want to know if the results are relevant, applicable and reliable. We ask: do they meet the requirement specifications?

Level 2. Human perspectives. This includes the acceptability of the system by the various stakeholders, and considers how the system's functions affect them. Rossi-Mori and Ricci (1988) include human perspectives in their outline, but only that of the immediate system's user. Foster & Conford's (1992) framework recognises at least three roles under human perspectives, which are sufficient for the case studies reported. In other situations, there may be more roles worthy of consideration, in which case, the number of stakeholders has to be increased. Assessing human perspectives of information systems is not easy and these aspects are not easily measurable. Researchers must allow themselves both the freedom to identify sufficient stakeholders and the freedom of using qualitative judgments in their analyses when quantitative measures cannot be obtained. We identify three stakeholders in this framework:

The user (Instructor). This is the primary agent in the system implementation, who is indispensable for its proper functioning. Within the SPO dimension, this poses questions such as:

- Structure - what are the changes to working conditions, in terms of the physical environment, skill requirements etc.?
- Process - how is the user's mode of operation changed? Are these changes seen as desirable to the user as an individual, and to the user's organisational role?
- Outcome - is the overall effectiveness of the user within the education system enhanced?

The Learner. This is the person who the system is expected to benefit, and who is often directly or indirectly affected by its implementation.

- Structure - are learners required to modify their behaviour in any way?
- Process - how is the learner's experience altered at the point of contact with the system?
- Outcome - does the use of the system result in changes in the quality of service and better education for the recipient?

The Administrator. This is the person responsible for the general management of the E-learning unit. Note that, since this is under the human perspective heading, assessment at this level is focused on the person responsible for the management of the individual E-learning unit rather than the whole education system. Thus, it is limited to the administrator's immediate concerns.

- Structure - is the system a reasonable, cost-effective and efficient alternative to existing structures?
- Process - does the system imply change in the delivery of activities for which the administrator is responsible'? Does it change the character of the administrator's job?
- Outcome - does the system improve specific education provision on a reasonable metric?

Level 3. Education system. This involves a consideration of the impact of a system's use on the education system as a whole, and on E-learning itself. It concerns the national developmental level in its widest possible sense.

- Structure - does it change the balance between the functions of the different education providers?
- Process - does it affect practice and delivered quality of education provision?
- Outcome - does it improve the education status and development potential of the population it serves?

The justification for the approach described here can be made from two main angles. Firstly, it provides a procedure that assesses the technical and the social aspects of a system, as well as the long-term impact on improving education provision. Secondly, it is a standardized procedure for reporting evaluation results that may be widely applied. In summary, the evaluation framework proposed here permits a structured view of E-learning projects which recognizes both the need to link an information technology grounded perspective with one that includes an understanding of the broader concept of education.

This model has been applied in Kenya and Rwanda to groups of Higher Education institutions. Among the E-learning evaluation frameworks examined, the researcher found it to be the most appropriate. The research questions and hypothesis of this study touch on technical, procedural, and human aspects of education systems; all the other frameworks examined by the researcher except this one addresses these aspects comprehensively.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes the research design, population and sampling, data collection methodology, research procedures, and data analysis methods.

3.2 Research Design

This research was a survey research: the main purpose being to determine to what extent Afghanistan is ready for E-learning in higher education. It was based on a survey-questionnaire tool known as E-LRAIA (E-learning Readiness Assessment In Afghanistan): E-learning perceptions, understanding and experiences of users of E-learning in public universities were identified, studied and interpreted based on this tool (See Appendix A). The tool was based on the "Technology Mediated E-learning Frame-work proposed by Omwenga and Rodrigues (2006). Technical, human, and educational system perspectives were mapped out onto a "structure-process-outcome" matrix using a Linkert 5 point scale from "Strongly Disagree to Strongly Agree".

The tool was administered to two categories of users: 1) those involved in structured E-learning in higher education in Afghanistan (standard group), and 2) those involved in higher education in Afghanistan but not engaged in structured E-learning (control group).

The research also deployed qualitative techniques through use of key informant interviews to gather data. Interview questions (see Appendix B) based on the objectives of the study were formulated and key stakeholders relevant to the study were interviewed based on this set of questions.

3.3 Population and Sampling Design

3.3.1 Population

The accessible population of the study consisted of users of E-learning users from four Public Universities in Afghanistan. There are 16 Public Universities in Afghanistan; four of them located in Kabul (the capital city) while the rest are in other provinces. The geographic locations of other Public Universities made it logistically and financially difficult to include all of them in the study. Most locations outside the capital city are predominantly insecure.

3.4 Sampling Design and Sample Size

3.4.1 Sampling Frame

The sampling frame was drawn from four public universities in Kabul City namely Kabul University, Kabul Education University, Kabul Medical University, and Kabul Polytechnic University. This entailed a list of all students, lectures, administrators involved in structured E-learning programs; that is Afghanistan Next Generation eLearning (ANGeL) and CISCO Networking Academies. This list was provided by the program managers in charge of each of these programs.

3.4.2 Sampling Technique

The first technique used a Probability Sampling of the users of structured E-learning in the four public universities in Kabul.

Stratified Random Sampling technique was used on the sample frame.

The first step entailed dividing the sample frame into two groups; the first group being users involved in structured E-learning (the standard group), and the second being users not involved in structured E-learning (control group). Sub-populations represented by the following faculties were developed for each of the two strata of users as follows:

Computer Science, Economics, Journalism, Social Science, Medicine, Literature, Law, Engineering, Dermatiology, Agriculture, Veterinary, Physiology, Hydrometeorolgy, Business, and Music.

These sub-populations were selected based on their relevance to the study.

The second technique used a purposive sampling in which the following categories of E-learning institutional stakeholders were considered:

Officials of:

- Ministry of Higher Education policy and planning department
- Ministry of Education –Dept of Technical & Vocational Education
- Ministry of Education –SHEP/ EQUIP World Bank Projects
- Research Fellows Program, Ministry of Education-Dept of Technical & Vocational Education
- Project Managers of ANGeL and CISCO E-Learning Initiatives
- Civil Services Commission Training Institution
- Education and Culture Project, Organizational for Integrated Development
- Academic Board of Education

- Ministry of Communications & IT. Information and Communication Technologies Dept

3.4.3 Sample Size

From the above stratification methods a sample of size of 350 users were selected to be interviewed through the survey questionnaire tool E-LRAIA.

Table 1. Sample Size Breakdown

University	Total Standard Group	Total Control Group
Kabul University	150	100
Kabul Education University	50	20
Kabul Medical University	30	20
Kabul Polytechnic University	20	10
Total	200	150

Based on the sample frame, a total of 350 questionnaires were distributed, response was received from 241 respondents signifying a response rate of 69% of the sample frame.

3.5 Data Collection Methods

The first primary data collection method used during the survey research was by method of a questionnaire, the E-LRAIA survey tool.

The E-LRAIA tool was formulated and pretested with a group of 20 E-learning users. Clarifications on instructions and questions were received from the users upon which changes and refinements were done on the tool. A total of 350 questionnaires distributed 241 were filled and returned, representing 69% response rate of the total sample size. Once the questionnaires were distributed, regular follow-ups were made and several schedules were agreed upon on the return times and through planned appointments. A team of eight enumerators were trained and used to administer some of the questionnaires. The method of communication was by phone calls and e-mail communication, and by set up meetings with the respondents. After gathering adequate information, and because of some respondents being non-committal due to varying circumstances, the received data was tabulated and analyzed using SPSS

The E-LRAIA research questionnaire was designed based on the "Technology Mediated E-learning Frame-work proposed by Omwenga and Rodrigues (2006). The first section of the tool had a total of 22 general questions touching on demographics and respondents background information on computer usage and E-learning experiences. The second part of the tool was divided into 5 sections as follows: Section B with 16 questions on Technical perspectives (for students and course instructors); Section C with 13 questions on Human perspectives (for students, and course instructors); Section D with 11 questions on Human perspectives (for administrators and managers); Section E with 13 questions on Educational system perspectives (for all categories of users); and Section F with 17 questions on factors affecting E-learning implementation. All the sections mentioned above formed the dependent variables, while the "structure-process-outcome" formed the independent variables. The dependent variables were mapped out onto a the independent variables forming a 3X3 matrix; a Likert 5 point scale from "Strongly Disagree to Strongly Agree" was then used.

The perceptions of students, instructors, lecturers, and administrators (on technical, human, and educational impact perspectives) were established using specific questions based on structure, process, and outcome. These perceptions were then tabulated and analyzed using SPSS.

The theoretical model acted as a good basis for the E-LRAIA tool and provided the ability for testing the model in a post-war reconstruction country context.

The second primary data collection method was key informant interviews. In this method, the following key questions were asked based on the research objectives:

- What factors exist within Afghanistan higher education systems that support the viability of E-Learning?
- What is the impact of E-Learning on students in higher education institutions?
- What is your perception of the level of E-learning readiness in Afghanistan higher Education Institutions?
- To what extent have the following factors affected E-learning? Technology and infrastructure, content and content management, social and cultural, Gender.

A total of 15 stakeholders were interviewed using the above questions and their responses to the questions recorded and organized in various categories. Emerging trends, patterns, and

relationships from the responses were then established. Adequacy, and usefulness of this information in answering the research question was then determined.

3.6 Research Procedures

In this study, the pilot testing of the research questionnaire tool provided an opportunity to simulate the actual survey. Issues identified in this stage helped further refine the tool and make it more precise. Due to barriers in understanding of technical terms, it became necessary to hire and train enumerators who helped with the questionnaire administration.
The enumerators were trained in the use of the instrument. The objectives of the study were explained to them. During the training, the enumerators identified ambiguities, gender biases, and culturally issues identified in the E-LRAIA tool which were then addressed before actual administration of the tool.

The questionnaires were distributed to the sample selected in different schedules during the month of February and March 2009. Prior introductory statements were made to the respondents and purposes of the study clearly outlined to them, the issue of anonymity and other concerns were clarified to those who raised concerns. While it was acknowledged that by answering all the questions would have been beneficial to the research study, it was made known that it was not a mandatory requirement in case the respondent felt that certain question did not fall within their work mandates.

Responses started being received from end of February 2009. It was initially envisaged that respondents could take between 2 to 3 days to complete out the questionnaires, however some respondents took longer than expected. Some respondents never returned the questionnaires despite numerous follow-ups made by e-mail, phone calls. The use of enumerators was deployed to ensure the respondents understood questions asked and answered them appropriately. In some instances assistance was offered in completing the questionnaire satisfactorily.

The key informant interviews also took place in the month of February and March 2009. A list of potential stakeholders was drafted based on the researchers' understanding of the ability of the stakeholders to provide information relevant to the study. Telephone calls and emails were then sent to each of the stakeholders to schedule meetings for the specific interviews. During the interviews, the purpose of the research was explained to the

stakeholders. It was also made clear to the stakeholders that the responses obtained would be treated with utmost confidentiality. Questions based on the research objectives listed in section 3.4 above were asked and the responses recorded exactly as expressed. Upon completion of the interviews, the stakeholders were thanked for their participation. It is worth noting that a number of stakeholders asked for anonymity and that their views not to be taken as representative of the organizations they work for.

3.7 Data Analysis Methods

The main data analysis tool used during the research study was SPSS. Data from each respondent in the survey was entered into SPSS. The data collected was sorted appropriately, and then edited for errors. The data was then coded and entered into SPSS for windows for in-depth analysis. The data was taken through a series of data cleaning procedures before analysis starts. Each respondent was assigned a unique number /code; and each of the specific answers for each question asked was assigned values of 1s and 0s. For each of the questions, the mode was derived based on the options with the highest score.

The analysis employed basic analytical procedures such as frequency distribution, mean, mode, median, minimum and maximum as measures of central tendencies and dispersions. Correlation analysis was used to determine the significance of the relationships between the dependent variables (various aspects of E-Learning) and the independent variables (Technology). Independent Sample t-test was use to test the significance of the mean differences in the level of acceptance of E-Learning between the standard group and the control group and the males and females. Analysis of Variance (ANOVA) was used to test the significance of the mean variations of the levels of acceptance across the various levels of education.

Quantitative statistical approaches including frequency tables, grouped frequency tables, and bar charts were used to represent the data in both categories of questions.

CHAPTER 4: RESULTS AND FINDINGS

4.1 Introduction

This chapter provides a summary of the results and findings that were obtained from the research done using E-LRAIA survey tool described in detail in Chapter 3. It also provides an analysis of the data obtained in the study.

4.2 Descriptive Results

Out of the 350 questionnaires that were given out to respondents, a total of 241 questionnaires were returned. The overall result of the study was therefore based on the 241 fully and correctly completed questionnaires that were returned. This represents 69% of the sample frame.

The first section of the E-LRAIA tool had a total of 22 general questions touching on demographics and respondents background information on computer usage and E-learning experiences. The following figures and tables shows the results based on some key areas under the general questions.

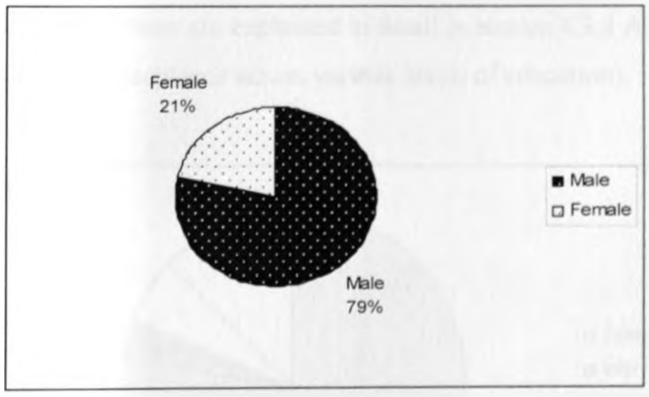


Figure 3: Gender of Respondents

From Figure 3 it can be seen that majority of the respondents in this study were male. Female respondents comprised on 21%. These figures are close to the Afghanistan national statistics which indicate that the number of females enrolled in higher educational institutions is 23% compared to 77% male enrollment.[1]

[1]World Bank, 2007. Afghanistan County Summary of Higher Education http://siteresources.worldbank.org/EDUCATION/Resources/278200-1121703274255/1439264-1193249163062/Afghanistan_CountrySummary.pdf

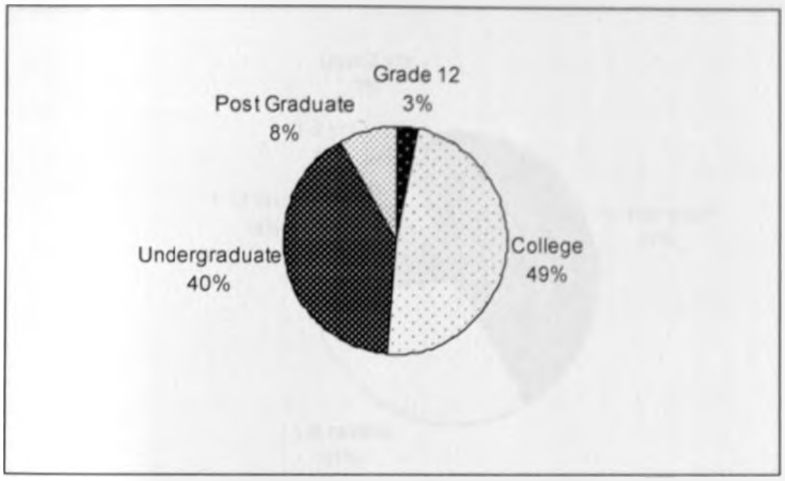


Figure 4: Respondents Level of Education

Figure 4 reveals that majority of the respondents in the study sample had College level of education or were Undergraduate Students. One of the key questions is in finding out how the impact of education level on perceptions of E-learning in higher education institutions. Results of these are explained in detail in section 4.3.4 Analysis of variance (ANOVA) – (level of acceptance across various levels of education).

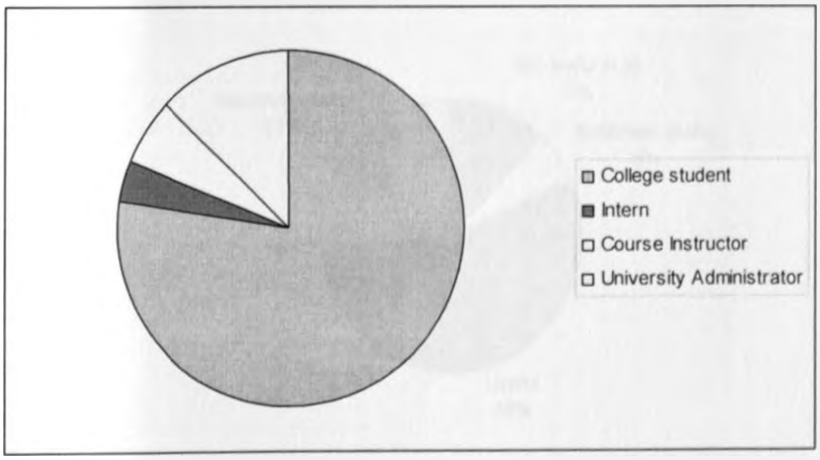


Figure 5: Respondents Categories

Figure 5 reveals that majority of the respondents who participated in the study were college students.

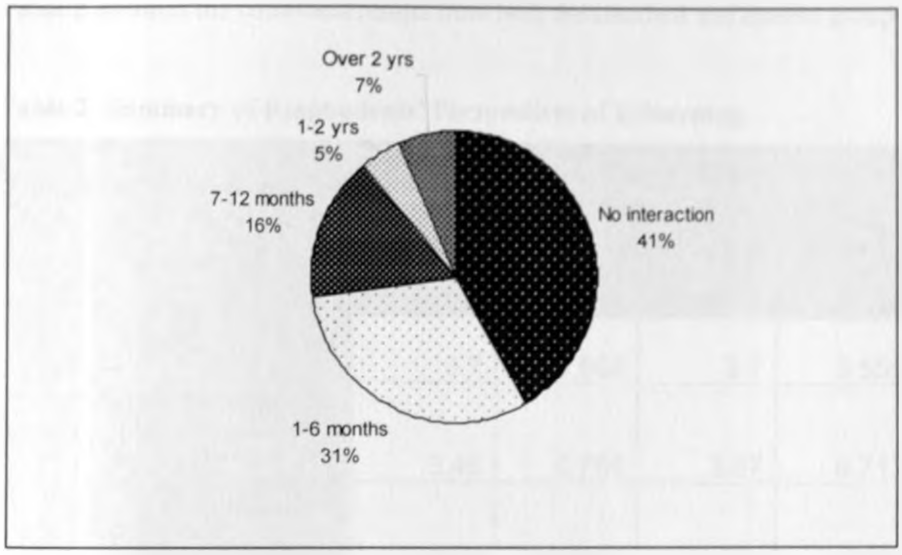


Figure 6: Respondents E-Learning Experience

Figure 6 shows that more than half of the study sample has not had any E-learning experience at all. Given the numbers from the standard group, it may be interpreted to mean that there are students in structured E-learning who are not even aware of the fact that they are undertaking E-learning.

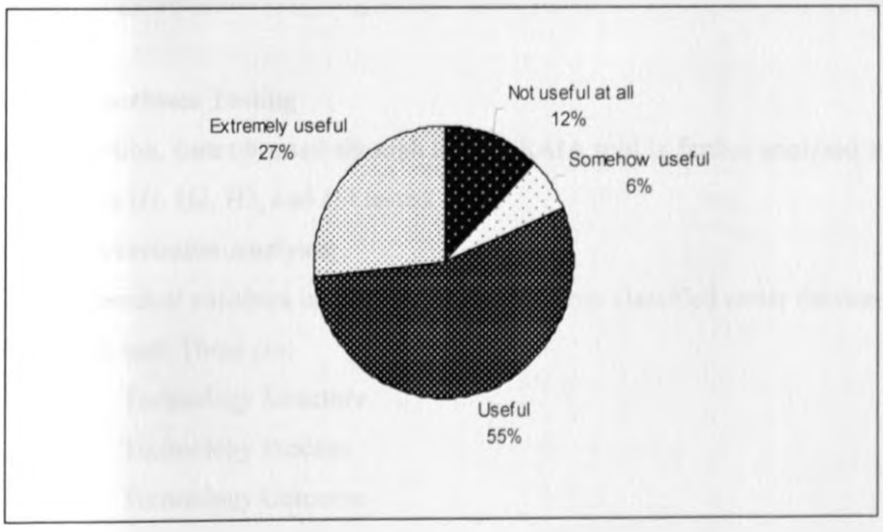


Figure 7: Respondents' Ratings of E-learning Usefulness

The statistics shown in Figure 7 reveals that over half of the respondents in the studye find E-learning to be useful; whereas the other half do not have an idea or find it not useful at all.

The second part of the tool was used to measure the perceptions of the respondents using the Technology Mediated learning framework explained in detail in Chapter 2.

Table 2 contains the combined results from both the standard and control groups.

Table 2. Summary of Respondents' Perspectives of E-learning.

Dependent Variables	Independent Variables					
	Structure		Process		Outcome	
	Mean Score	Standard Deviation	Mean Score	Standard Deviation	Mean Score	Standard Deviation
Technical System Perspectives	3.7	0.555	3.7	0.555	3.7	0.555
Human Perspectives (students and Course Instructors)	3.45	0.768	3.67	0.713	3.97	0.681
Human Perspectives (Administrators and Managers)	3.49	0.674	3.4	0.791	3.74	0.617
Educational Systems Perspectives	3.66	0.702	3.74	0.676	3.93	0.703
Technology Factors Affecting E-learning	3.59	0.667	3.55	0.764	3.43	0.754
Overall Values	**3.578**	**0.6732**	**3.612**	**0.6998**	**3.754**	**0.662**

The consistency of the results shown in Table 2 is indicative of the coherency of the "Technology Mediated Learning Model" upon which the E-LRAIA tool was based.

4.3 Hypotheses Testing

In this section, data obtained through the E-LRAIA tool is further analyzed and the research hypotheses H1, H2, H3, and H4 tested.

4.3.1 Correlation Analysis

The independent variables in this study are the factors classified under Section F of the E-LRAIA tool. These are:

i. Technology Structure
ii. Technology Process
iii. Technology Outcome

The dependent variables are the factors identified under "technology mediated learning framework" explained in Omwenga and Rodrigues (2006) model. These are:

i. Technical perspectives - structure, process, outcome
ii. Human Perspectives - structure, process, outcome
iii. Education Impact - structure, process, outcome

Correlation analysis was used to determine the significance and degree of the relationships between the dependent variables and the independent variables mentioned above. This analysis will also test the hypothesis no H4 which states: High investments in technology and infrastructure affect the outcomes of E-learning in Afghanistan

The results obtained are shown as follows:

Table 3. Technical Perspectives Correlations

		Standard Group (N=141)			Control Group (N=100)		
Dependent Variables(system Perspectives)		Independent Variables (Technology Factors)			Independent Variables (Technology factors)		
	Statistics	Structure	Process	Outcome	Structure	Process	Outcome
Technical Perspective - Structure	Pearson Correlation (r)	0 093	0 168	0 047	0 081	0 055	0 088
	Sig (2-tailed) p	0 306	0 066	0 63	0 483	0 632	0 445
Technical Perspective - Process	Pearson Correlation(r)	0.093	0 168	0 047	0 081	0 055	0 088
	Sig (2-tailed) p	0 306	0.066	0 63	0 483	0 632	0 445
Technical Perspective - Outcome	Pearson Correlation	0 093	0 168	0 047	0 081	0.055	0 088
	Sig (2-tailed)p	0 306	0 066	0 63	0 483	0 632	0 445

From the statistics in Table 3 for both the standard and control groups, there is no significant relationship between the Technical Perspective factors (dependent variables) and Technology Factors (independent variables) since $p \geq 0.05$ in all cases. This is because all tests for significance were done at 95% confidence level. therefore there would only be a significant relationship when $p \leq 0.05$.

Table 4. Human Perspectives Correlations

		Standard Group (N=141)			Control Group (N=100)		
Dependent Variables (System Perspectives)		Independent Variables (Technology Factors)			Independent Variables (Technology Factors)		
	Statistics	Structure	Process	Outcome	Structure	Process	Outcome
Human Perspective (Students) - Structure	Pearson Correlation (r)	0.082	0.14	-0.161	0.051	0.003	0.08
	Sig. (2-tailed) (p)	0.378	0.135	0.107	0.83	0.99	0.737
Human Perspective (Students) - Process	Pearson Correlation (r)	0.005	0.053	-0.089	0.046	0.117	0.02
	Sig. (2-tailed) (p)	0.962	0.576	0.384	0.851	0.635	0.934
Human Perspective (Students) - Outcome	Pearson Correlation (r)	0.001	0.093	-0.036	0.006	-0.191	0.285
	Sig. (2-tailed) (p)	0.99	0.327	0.721	0.98	0.421	0.224
Human Perspective (Admins/Managers) - Structure	Pearson Correlation (r)	-0.03	0.035	0.037	-0.495	0.391	0.818
	Sig. (2-tailed) (p)	0.879	0.862	0.869	0.505	0.609	0.182
Human Perspective (Admins/Managers) - Process	Pearson Correlation (r)	-0.052	0.208	0.056	-0.64	0.68	0.079
	Sig. (2-tailed) (p)	0.795	0.297	0.806	0.36	0.32	0.921
Human Perspective (Admins/Managers) - Outcome	Pearson Correlation (r)	0.158	0.262	0.14	-0.91	**.966(*)**	0.074
	Sig. (2-tailed)(p)	0.422	0.186	0.534	0.09	**0.034**	0.926

* Correlation is significant at the 0.05 level (2-tailed).

From Table 4, among the control group, there is a significant relationship between the Technology Process and Human Perspective (Administrators/Managers) Outcome with ($r = 0.966$, $p = 0.034$).

This relationship shows that most administrators and managers in the control group have a better perception of the impact of E-learning technology on students' performance than their counterparts in the standard group.

Table 5. Educational Impact System Perspectives Correlations

		Standard Group (N=141)			Control Group (N=100)		
Dependent Variables (System Perspectives)		Independent Variables (Technology Factors)			Independent Variables (Technology Factors)		
	Statistics	Structure	Process	Outcome	Structure	Process	Outcome
Educational Impact - Structure	Pearson Correlation (r)	**0.336(**)**	**0.315(*)**	-0.018	0.177	0.100	0.094
	Sig. (2-tailed)(p)	0.005	0.011	0.901	0.246	0.514	0.541
Educational Impact - Process	Pearson Correlation (r)	**0.341(**)**	**0.400(**)**	0.261	**0.336(*)**	0.172	0.184
	Sig. (2-tailed)(p)	0.005	0.001	0.070	0.026	0.264	0.232
Educational Impact - Outcome	Pearson Correlation(r)	**0.272(*)**	**0.437(**)**	-0.101	0.226	0.087	0.036
	Sig. (2-tailed) (p)	0.026	0.000	0.489	0.141	0.573	0.818

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Note:

1. All tests for significance were done at 95% confidence level, therefore there is a significant relationship when $p \leq 0.05$.

2. Among the standard group, there is a significant relationship between the Technology Structure and Educational System Structure, Process and Outcome with ($r = 0.336$, $p = 0.005$), ($r = 0.341$, $p = 0.005$), ($r = 0.272$, $p = 0.026$) respectively. There is also a significant relationship between the Technology Process and Educational System Structure, Process and Outcome with ($r = 0.315$, $p = 0.011$), ($r = 0.400$, $p = 0.001$), ($r = 0.437$, $p = 0.000$) respectively.

3. Among the control group, there is only one significant relationship between the Technology Structure and Educational System Process with ($r = 0.336$, $p = 0.026$).

From the correlations analysis in Table 5; the significant relationship between Technology Structure, Process, and Outcome factors Educational Impact Structure, Process, and Outcome support the Hypothesis H4: High investments in technology and infrastructure affect the outcomes of E-learning in Afghanistan. Put in other words, there is a very strong relationship between investments in ICT infrastructure and the resultant impacts from the E-learning educational system.

4.3.2 Independent Sample t-test (standard group vs control group)

As explained earlier, the independence sample t-test was used to test the significance of the mean difference in the level of acceptance of E-learning between the standard group and control group. This is demonstrated in Table 6:

Table 6. T-Test: Group Statistics

	Type of Respondent	N	Mean	Std. Dev	Std. Error Mean
Technical Perspective-Structure	Standard	141	3.65	.559	.048
	Control	100	3.77	.545	.057
Technical Perspective-Process	Standard	141	3.65	.559	.048
	Control	100	3.77	.545	.057
Technical Perspective-Outcome	Standard	141	3.65	.559	.048
	Control	100	3.77	.545	.057
Human Perspective(Students) - Structure	Standard	141	3.41	.794	.069
	Control	100	3.63	.591	.118
Human Perspective(Students) - Process	Standard	141	3.64	.724	.064
	Control	100	3.81	.649	.132
Human Perspective(Students) - Outcome	Standard	141	3.98	.685	.060
	Control	100	3.90	.669	.134
Human Perspective(Admin/Managers) - Structure	Standard	141	3.57	.643	.107
	Control	100	3.11	.748	.283
Human Perspective(Admin/Managers) - Process	Standard	141	3.37	.804	.134
	Control	100	3.52	.766	.290
Human Perspective(Admin/Managers) - Outcome	Standard	141	3.80	.629	.105
	Control	100	3.43	.472	.179
Educational System - Structure	Standard	141	3.72	.669	.081
	Control	100	3.55	.744	.111
Educational System - Process	Standard	141	3.73	.693	.084
	Control	100	3.76	.658	.099

	Type of Respondent	N	Mean	Std. Dev	Std. Error Mean
Educational System - Outcome	Standard	141	3.91	.766	.093
	Control	100	3.95	.601	.091
Technology - Structure	Standard	141	3.59	.629	.056
	Control	100	3.60	.725	.080
Technology - Process	Standard	141	3.57	.731	.066
	Control	100	3.51	.814	.089
Technology - Outcome	Standard	141	3.37	.805	.078
	Control	100	3.50	.681	.075
Overall Acceptance Mean Score	Standard		3.640		
	Control		3.638		
Overall Accepetance Mean Score			**3.64**	**0.193**	

NOTE: Table 6 shows the mean scores (level of acceptance) of the various factors of E-Learning by the two groups (standard and control). The significance test for the differences in the mean scores observed above between the two groups is contained in the Table 7 of Independent Samples Test. The findings indicates that both groups on average have mean score of three (neutral) and above, however most of the means are above 3.5 (agree). This result does not support hypothesis H1 which states: Respondents who have never had interaction with E-learning will report a negative perception of E-learning readiness in Afghanistan. Put differently, the overwhelming majority of respondents in the study sample have a positive perception of E-learning readiness in Afghanistan.

Table 7: Independent Samples Test (N=241 and Equal Variances Assumed)

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
TP - Structure	.088	.767	-1.542	227	.124	-.115	.075	-.262	.032
TP - Process	.088	.767	-1.542	227	.124	-.115	.075	-.262	.032
TP -Outcome	.088	.767	-1.542	227	.124	-.115	.075	-.262	.032
HP- Structure	2.281	.133	-1.327	154	.186	-.222	.167	-.552	.108
HP- Process	.693	.406	-1.074	150	.284	-.170	.159	-.484	.143
HP - Outcome	.014	.906	.549	152	.584	.082	.149	-.213	.377
HP A&M- Structure	1.052	.311	1.698	41	.097	.462	.272	-.088	1.012
HP A&M - Process	.333	.567	-.465	41	.644	-.153	.330	-.820	.513
HP A&M- Outcome	.334	.566	1.472	41	.149	.370	.251	-.138	.878
ES - Structure	2.366	.127	1.252	111	.213	.168	.134	-.098	.435
ES - Process	.225	.636	-.231	110	.817	-.030	.131	-.291	.230
ES - Outcome	4.515	.036	-.235	110	.815	-.032	.137	-.303	.239
Tech - Structure	2.362	.126	-.032	206	.974	-.003	.095	-.190	.184
Tech - Process	.424	.516	.631	203	.528	.069	.109	-.146	.283
Tech - Outcome	1.673	.198	-1.146	188	.253	-.126	.110	-.344	.091

KEY: TP = Technical Perspective; HPS-Human Perspectives – Students; HPA&M Human Perspectives – Admins/Managers; Tech = Technology.

4.3.3 Independent Sample t-test (Gender analysis): Equal Variances Assumed.

Used to measure the difference in E-learning readiness perception between males and females in the study.

Table 8: Group Statistics

	Gender of respondent	N	Mean	Std. Deviation	Std. Error Mean
Technical Perspective-Structure	Male	179	3.68	.539	.040
	Female	48	3.74	.621	.090
Technical Perspective-Process	Male	179	3.68	.539	.040
	Female	48	3.74	.621	.090
Technical Perspective-Outcome	Male	179	3.68	.539	.040
	Female	48	3.74	.621	.090
Human Perspective(Students) - Structure	Male	121	3.41	.731	.066
	Female	33	3.58	.905	.158
Human Perspective(Students) - Process	Male	118	3.68	.675	.062
	Female	32	3.60	.847	.150
Human Perspective(Students) - Outcome	Male	120	3.97	.646	.059
	Female	32	3.99	.809	.143
Human Perspective(Admin/Managers) - Structure	Male	29	3.48	.710	.132
	Female	13	3.50	.637	.177
Human Perspective(Admin/Managers) - Process	Male	29	3.51	.754	.140
	Female	13	3.26	.807	.224
Human Perspective(Admin/Managers) - Outcome	Male	29	3.78	.593	.110
	Female	13	3.67	.695	.193
Educational System - Structure	Male	89	3.68	.709	.075
	Female	23	3.55	.691	.144
Educational System - Outcome	Male	89	3.89	.685	.073
	Female	22	4.01	.762	.162
Technology - Structure	Male	165	3.60	.668	.052
	Female	41	3.54	.648	.101
Technology - Process	Male	163	3.53	.765	.060
	Female	40	3.56	.761	.120
Technology - Outcome	Male	151	3.47	.744	.061
	Female	37	3.26	.783	.129

Table 9: Independent Sample t-test for Equality of means

	Levene's Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
TP -Structure	.000	.985	-.625	225	.532	-.057	.091	-.235	.122
TP -Process	.000	.985	-.625	225	.532	-.057	.091	-.235	.122
TP-Outcome	.000	.985	-.625	225	.532	-.057	.091	-.235	.122
HP - Structure	1.602	.208	-1.094	152	.276	-.166	.151	-.465	.133
HP - Process	3.592	.060	.561	148	.575	.080	.142	-.201	.361
HP - Outcome	.191	.662	-.162	150	.871	-.022	.136	-.291	.247
HP - Structure	.632	.431	-.075	40	.941	-.017	.230	-.482	.448
HP - Process	.005	.941	.970	40	.338	.249	.257	-.270	.769
HP - Outcome	.499	.484	.534	40	.596	.111	.209	-.310	.533
ES - Structure	.139	.710	.800	110	.425	.132	.165	-.195	.459
ES - Outcome	.082	.775	-.714	109	.477	-.119	.167	-.449	.211
Tech - Structure	.212	.645	.521	204	.603	.060	.116	-.168	.289
Tech - Process	.076	.782	-.171	201	.865	-.023	.135	-.289	.243
Tech - Outcome	.015	.904	1.539	186	.126	.212	.138	-.060	.484

KEY: TP = Technical Perspective; HPS-Human Perspectives – Students; HPA&M Human Perspectives – Admins/Managers; Tech = Technology

Note: There is no significant mean difference between males and females across all items ie all the p – values for all t-tests are greater than 0.05 as demonstrated in Tables 8 and 9.

The analysis shown in Table 8 and 9 supports hypothesis H2 which states: There will be no statistically significant difference in perception of E-learning readiness in Afghanistan based on respondent's gender.

4.3.4 Analysis of variance (ANOVA)

Analysis of Variance (ANOVA) was used to test the significance of the mean variations of the levels of acceptance across the various levels of education.

Table 10: ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Technical Perspective-Structure	Between Groups	1.070	3	.357	1.145	.332
	Within Groups	68.874	221	.312		
	Total	69.945	224			
Technical Perspective-Process	Between Groups	1.070	3	.357	1.145	.332
	Within Groups	68.874	221	.312		
	Total	69.945	224			
Technical Perspective-Outcome	Between Groups	1.070	3	.357	1.145	.332
	Within Groups	68.874	221	.312		
	Total	69.945	224			
Human Perspective(Students) - Structure	Between Groups	1.825	3	.608	1.042	.376
	Within Groups	85.837	147	.584		
	Total	87.662	150			
Human Perspective(Students) - Process	Between Groups	2.577	3	.859	1.817	.147
	Within Groups	67.583	143	.473		
	Total	70.160	146			
Human Perspective(Students) - Outcome	Between Groups	.646	3	.215	.466	.706
	Within Groups	67.443	146	.462		
	Total	68.089	149			
Human Perspective(Admin/Managers) - Structure	Between Groups	.787	3	.262	.535	.661
	Within Groups	18.137	37	.490		
	Total	18.924	40			
Human Perspective(Admin/Managers) - Process	Between Groups	.447	3	.149	.254	.858
	Within Groups	21.748	37	.588		
	Total	22.195	40			
Human Perspective(Admin/Managers) - Outcome	Between Groups	.597	3	.199	.495	.688
	Within Groups	14.896	37	.403		
	Total	15.494	40			
Educational System -	Between Groups	1.791	3	.597	1.200	.313

		Sum of Squares	df	Mean Square	F	Sig.
Structure	Within Groups	53.206	107	.497		
	Total	54.996	110			
Educational System - Process	Between Groups	3.542	3	1.181	2.912	.038
	Within Groups	42.985	106	.406		
	Total	46.527	109			
Educational System - Outcome	Between Groups	2.441	3	.814	1.711	.169
	Within Groups	50.400	106	.475		
	Total	52.841	109			
Technology - Structure	Between Groups	.334	3	.111	.250	.861
	Within Groups	89.096	200	.445		
	Total	89.430	203			
Technology - Process	Between Groups	.851	3	.284	.476	.699
	Within Groups	117.439	197	.596		
	Total	118.290	200			
Technology - Outcome	Between Groups	1.932	3	.644	1.177	.320
	Within Groups	99.570	182	.547		
	Total	101.502	185			

NOTE: Table 10 indicates there is no significant mean variance across all levels of education in all the variables i.e. all the p-values for f-Statistics are greater than 0.05 threshold. This result does not support Hypothesis H3 which states: There is a positive relationship between level of education and E-learning readiness perception in Afghanistan. Stated otherwise, this study found that the perception of E-learning readiness is not affected by the respondent's level of education; perceptions measured across all educational levels have similar results.

CHAPTER 5: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter culminates the study report. It provides a discussion on the interpretation of the results and findings, conclusions drawn from the findings, and recommendations for future research.

5.2 Discussion

5.2.1 The Main Study Question

The results and findings presented in Chapter 4 contribute significantly in answering the main study question: "Are Higher Education Institutions in Afghanistan ready for E-learning?" Two of the four research hypotheses were confirmed as true; while the other two were not supported by the results. Hypothesis H1 was not supported by the results and analyses presented in Chapter 4. This implies that even though majority of the respondents have never had interaction with E-learning, they overwhelmingly report a positive attitude towards e-learning readiness in Afghanistan. From the key informant interviews and from the results of the survey using the E-LRAIA tool, majority of the respondents believe that the chance of E-learning success within institutions of higher education is very high due to wide acceptance by students. This notion is further supported by the overall E-learning acceptance mean score of 3.64 as revealed in the results of the Independent Sample t-test.

In the following sections, we discuss each of the specific questions of the study in relationship to the study findings.

5.2.2 What factors in Afghanistan higher education systems that support the viability of E-Learning?

Majority of respondents interviewed highlighted increased relationship among Afghanistan Universities with global higher education institutions who have expressed partnerships using the E-learning platforms as a key factor in facilitating implementation of E-learning.
There is also generally limited capacity of existing classrooms at academic institutions; this coupled with the high cost of building new facilities makes e- learning an attractive alternative for Afghanistan.
The existing telecommunications infrastructure, in terms of primary access lines, data circuit availability, ISPs and satellite communication capabilities are considered adequate to support

e- learning in Afghanistan. An official in the Ministry of Communications & Information Technology reported that the "Fiber Optics Ring Project" has been competed, tested and functional, and the major universities and regional universities will be connected in due course, this would facilitate data and information and courseware sharing among the universities but more importantly it will provide opportunities for students to take more courses online.

The following are factors the respondents highlighted as pertinent in support of E-learning readiness:

- Availability of low cost internet access;
- Increased access to computers
- Open source software environment established
- Increased computer literacy

The main concern expressed with regards to technical and infrastructure is inadequacy of technical support for e- learning initiatives. E-learning by its nature requires a certain level of technical sophistication which is usually extensive and requires special trainings. Currently Afghanistan has limited IT technicians and software applications specialists to support e-learning environment and officials of the technical vocational education unit of the Ministry of Education suggested that more support be given to increase ICT technical capabilities of Afghanistan. The study revealed that the new faculty of computer engineering in Kabul Polytechnic University has put in place facilities to equip students in ICT industry skills.

5.2.3 What is the perception of various stakeholders of the level of E-learning readiness in Afghanistan higher Education Institutions

From the study results, 69% of the respondents who participated in the E-LRAIA survey rated Afghanistan as either somehow ready, ready, and very ready for E-learning; where as 29% percent indicated that Afghanistan is not ready for E-learning. The remaining 2% did not respond. Nine out of twelve (75%) key informant interview respondents rated Afghans higher education as technically ready to support a more comprehensive country-wide E-learning implementation. Sixty-seven percent of the institutional respondents believe Afghanistan higher education system is ripe and ready for e- learning but needs a national awareness and education technology strategic plan to garner support of decision-makers, private sector, donors and educational partners. These statistics show coherence in E-learning readiness perceptions amongst the various groups.

Stakeholder respondents in the study strongly believe that political leadership support of e-learning at all levels is very critical in Afghanistan. While some individuals who are in educational leadership role are in support of a comprehensive E-learning at higher education level, most of the educational and institutional leaders are less supportive. Thus the higher education system in Afghanistan does not recognize distance learning degrees.

Despite various amendments of the Higher Education Act to accommodate trends and standards, there is still a strong resistance to e- learning and distance learning education by higher education ministry officials.

Respondents believe that without a revision of the Higher Education Act to accommodate e-learning, a comprehensive and successful e- learning strategy will be impossible.

Accreditation (recognition) of degrees received via distance and/ or e learning should be a priority with a "leadership champion/ focal point" with the clout and influence to achieve cooperation, collaboration and consensus across and within ministries, across and within universities and with donors and private sectors

Another concern expressed by the respondents is the lack of defined leadership structure and institutional standards in Afghanistan's higher education system; respondents believe that the system is greatly influenced by politics and individual biases. For example, the higher education system restrains people older than 45 year to register in the universities, and there is no provision for physically challenged persons in the higher education system

Overall barring the limitation of the higher education policy on recognition of full distance e-learning degrees, 67% (8 out of 12) institutional respondents believe Afghanistan higher education system is ripe and ready for E-learning but needs a national awareness and education technology strategic plan to garner support of decision-makers, private sector, donors and educational partners

There is strong agreement among respondents that E-learning is important to Afghanistan's present and future higher education system, and thus must be given higher priority through a holistic perspective which is more coordinated and collaborative rather than piece-meal approach.

5.2.4 What is the impact of gender and educational level on perceptions of E-learning in Higher Education Institutions?

a)Gender and E-learning readiness perception in Afghanistan

The study hypothesis H2 was found to be true based on an independent sample t-test conducted in Chapter 4. This means that there is no difference in perception on E-learning in Afghanistan based on gender.

Figure 3 (Chapter 4) reflects that 21% of respondents were females compared to 79% males. It is interesting to note that even in a country where women are downtrodden and generally not given equal access to education as their male counter-parts; the few who have access to education report no major difference in perception when compared to the males. In this study, it has been observed that E-learning is providing and opportunity to bridge the communications gap that exists in the country, particularly among women. Women in particular face movement restriction due to security concerns and local traditions; but E-learning has caused women to become empowered and has provided access to the global communications networks. The key informant interviews revealed that cultural objections, low literacy levels among female students, and course timings (courses offered in the evenings) prevent more women from participating in E-learning initiatives.

b) Level of Education and E-learning readiness perception in Afghanistan

In one study (Cheng 2006) the survey results indicated that students who opted for E-learning for business courses were found to be much more willing to utilize E-learning again. It was realized that students who applied for E-learning for business courses have a positive attitude towards E-learning.

This study however contradicts the findings stated above. Using the analysis of variance (ANOVA) to measure the level of variance across the different levels of education; the study revealed that the perception of E-learning readiness is not affected by the respondent's level of education. This finding does not support Hypothesis H3.

E-learning provides an opportunity for higher education learning in Afghanistan as it meets the needs of the higher education market. Education Ministry officials interviewed estimated that there are only 24,000 slots for over 72,000 high school students qualified for university admission annually in Afghanistan. Supporting evidence expressed by over 80% (10 out if 12 interviewed) of respondents is that in the next three to five years (2010-2015) about 80% of new skilled jobs in Afghanistan will require at least some post secondary education.

Since the fall of Taliban in 2001, about 2,200 University teaching staff have returned to the classrooms. Slightly more than 50 percent have bachelor's degrees, 41% have master's degrees, and 7% hold PhDs. Twelve percent of the faculty are female; 465 of the 2,000 are professors of education. The average age of the faculty is 50 years old; approximately 50%

have taught for 20 years or more. Fewer than 15% are computer literate and able to make use of the Internet on a regular basis.[2]

5.2.5 To what extent have the following factors affected E-learning? Technology and Infrastructure, Content and Content Management, Educational Policies.

In this study, it was found that there is a significant relationship between Technology Structure, Process, and Outcome factors; and the Educational Impact Structure, Process, and Outcome. This finding support the Hypothesis H4: High investments in technology and infrastructure affect the outcomes of E-learning in Afghanistan.

This finding agrees with the research done by Ya'acob, Nor & Azman (2005), p24. "Limitation of infrastructure, such as computer labs and continuous limitations to access the internet hamper the effective use of technology supported teaching and learning"

In a similar study, El-Zayat and Fell (2006): "Assessment of E-learning in Egypt through the Perceptions of Egyptian University Students"; it was found that there is a strong relationship between technology and learning. The study reported that 48.4% of the students questioned felt that the application of technology can significantly enhance the learning process.

One of the findings in Omwenga and Rodrigues (2006) was that technology has a positive impact in supporting education provision. The study found that E-learning is a viable mode of delivery. However, recommendations on the form, structure and process of introducing universal E-learning in institutions of higher learning needs a much broader evaluation in terms of capacity to sustain the technology and enabling access to it that will not exclude others.

Form the key informant interviews, there was a unanimous agreement among respondents that the physical infrastructure and in particular technology infrastructure is still less than adequate in Afghanistan. Electricity supply and learning teaching equipment and furniture are grossly insufficient, and necessary administrative equipment are in short supply; and the available ones are often not functional. Classroom, laboratory and literary facilities are ill equipped, while computer facilities are lacking for equipment and instruction and administration resources to meet the increasing student's demands for information technology learning.

---

[2] World Bank, *Technical Annex for a Proposed Grant to the Islamic Republic of Afghanistan for Strengthening Higher Education Program*, January 10, 2005, pp. 4-5.

However, the respondents identified the following as enabling environment qualities for the viability of E-Learning in Afghanistan.

- Installation of digital technologies in public universities in Kabul connecting Universities to Kabul Fiber Optics which is part of the NATO Digital Silk Road Project
- Provision of computer laboratories, software, internet connectivity and E-learning modules through multilateral and bilateral development agencies
- Affordable internet service by telecommunication companies
- The increasing growth of internet cafes mostly in densely populated urban cities
- One-laptop-per child, created by the Ministry of Education with the intent to helping every school child not just have access to but to own a personal computer
- Abundance of E-learning content for English Language and private IT skills training centers across the country
- The rising demand for education in Afghanistan whereas there are not enough schools and teachers, therefore E-learning is seen as viable means and alternative to learning
- Absence of text books due to costs and regional challenges have created a good environment for e- learning.

Without appropriate equipment and easy access, it is quite hard, if not impossible, to implement any E-learning (Oliver & Towers, 2000). However, as Aydin, & Tasci, (2005) states, E-learning does not require a huge infrastructure. Even a well working Internet connection and supplying enough computers for end-users would be sufficient for an effective E-learning project.

5.3 Conclusion

There has been no previous study to assess the country readiness for E-learning in higher educational institutions in Afghanistan. The goal of this study was to fill this gap by analyzing whether Afghanistan is ready for E-learning in higher institutions of learning.

The influence and impact of variables such as gender, and educational level on perceptions of E-learning has been examined. As found in the study, these factors have no effect on perceptions of E-learning readiness. In addition, the relationship between technology mediation and the educational system impact has been established; and it was found that there is a significant relationship between these variables.

From the research findings, we can conclude that there is a favorable perception towards E-learning readiness in Afghanistan.

5.4 Recommendations

While there are indicators which suggest Afghanistan may be ready for E-learning, there are yet some issues which should be addressed before successful implementation in higher education. Validation of the medium at national level is essential for successful implementation; and efficacy and effectiveness of E-learning programs needs to be proven. In addition, support from and endorsement by the government of Afghanistan is needed. To this end, the government might consider providing encouragement for educational institutions to develop and offer E-learning supported programs and consider giving official recognition of these programs.

The following recommendations will enhance E-learning implementation in Afghanistan's higher education system:

Technical Perspectives:

- A review of existing technology projects in the higher education system as a platform for developing a unified higher education technology framework and plan.
- Provide IT basic and how to use technology for instructional design to faculties.
- Expand computer laboratories and provide training for computer technicians in vocational institutions.
- Provide affordable personal computer plan for college students and faculty.

Human Perspectives:

- Shared vision – All stake holders must have a common understanding of E-learning, and shared vision of why and how to best deploy technology (E-Learning) across the higher education system.
- A holistic (coordinated/collaborative) approach to E-learning.
- Leadership support – promotes and secures broad political and private sector support.
- Expedite action on regulatory environment supportive and legal systems protective of E-learning systems and processes.

Educational Impact:

- Increase and improve distance E-learning materials available to be more subjects relevant in the universities.

- Increase awareness of the functionality of E-learning and its associated tools and technologies to Afghan educators, administrators, students as well as other students as well as other key stake holders in the government, NGO and private sectors.

5.5 Further Research

New researchers in should investigate other variables that affect E-learning perceptions such as the relationship between culture and E-learning perceptions. This research focused on Higher Education; however, there should be further research in Afghanistan Basic Education; and the relationships of factors that affect E-learning in both Basic and Higher Education systems should be examined.

REFERENCES

Anderson, T. (2002). Is e-learning right for your organization? Learning Circuits: ASTD's Online Magazine All About E-Learning. Retrieved July 25, 2007, from, http://www.learningcircuits.org/2002/jan2002_anderson.html

ANGeL, 2008. Retrieved on March 3, 2009 from http://www.stockholmchallenge.se/data/312

Aydin, C. H., & Tasci, D. (2005). Measuring Readiness for E-learning: Reflections from an Emerging Country. Educational Technology & Society, 8 (4), 244-257. http://www.ifets.info/journals/8_4/22.pdf. Retrieved May 24, 2009.

Barron, T. (2002). Evolving business models in E-learning: Summary white paper. A Learning on Demand (LoD) Report. Retrieved on July 25, 2008, from, http://www.sric-bi.com/LoD/summaries/EvolvBizModelsSum.pdf.

Barron, T. (2002). Evolving business models in E-learning: Summary white paper. A Learning on Demand (LoD)Report, Retrieved on retrieved March 15, 2009, from, http://www.sricbi.com/LoD/summaries/EvolvBizModelsSum.pdf.

Beckstrom, Mark, IBM; Croasdale, Hud and Sedki M. Riad, Virginia Tech; and Mostafa M. Kamel, PfCE. Assessment of Egypt's eLearning Readiness. Retrieved on February 25, 2009 from http://www.ltss.bris.ac.uk/events/egypt/ellen/readiness.doc

Borotis, S. and Poulymenakou, A. (2004). E-learning Readiness Components: Key Issues to Consider Before Adopting E-learning Interventions. Retrieved on Nov. 2, 2007 from http://www.eltrun.gr/papers/el.Readiness_ELEARN2004.pdf

Broadbent, B. (2001). Tips to help decide if your organization is ready for E-learning. Retrieved February 25, 2008, from, http://icde.net/en/arshive/articles/012.htm.

Centre for Information Technology in Education (CITE). (2003). Second International Information Technology in Education Study Module 2 (SITES M2). Retrieved on March 15, 2009 from http://sitesdatabase.cite.hku.hk/keyfinding/001_key%20finding%20-%20final%20wtih%20tables.pdf

Chapnick, S. (2000). Are You Ready for E-Learning? Retrieved on February 26, 2008 from http://www.astd.org/ASTD/Resources/dvor/article_archives.htm.

Cheng K. (2006). A Research Study on Students' Level of Acceptance in Applying E-learning for Business Courses – A Case Study on a Technical College in Taiwan. Journal of American Academy of Business. Volume 8. Number 2. pp: 265-270.

Commission on Technology and Adult Learning (2001). A vision of E-learning for America's workforce. http://www.nga.org/cda/files/ELEARNINGREPORT.pdf.

Development Gateway Foundation. 2006. http://topics.developmentgateway.org/afghanistan/highlights/viewHighlight.do?activeHighlightId=108621

El-Zayat. Mohamed . and Fell. Alan (2006). An Assessment of E-learning in Egypt Through The Perceptions of Egyptian University Students: A Field Work Survey. University of Sunderland. United Kingdom.http://www.scribd.com/doc/951789/Assessment-of-Elearning-Perceptions. Retrieved on May 24. 2009.

Foster. D., & Conford T. (1992). Evaluation of Health Information systems: Issues. Models and Case studies. Bhatnagar. S.C. & Odedra M. (eds.). Social Implications of computers in Developing Countries. McGraw-Hill. 304-309.

Fry. K. (2000) "E-Learning markets and providers: some issues and prospects", Education & Training. Vol. 43. No.4/5

Gilbert. S.. & Jones. S.(2001). E-learning is e-normous: Training over the Internet has become the fastest growing workplace performance improvement tool and utilities are using it in several ways. ElectricPerspectives. 26 (3). 66-82.

Gunawardena. C. N., Nolla. A. C., Wilson. P. L., Lopez-Islas. J. R., Ramirez-Angel. N., & Megchun-Alpizar. M.(2001). A cross-cultural study of group process and development in online conferences. Distance Education. 22(1). 85-121.

Haney. D. (2002). Assessing organizational readiness for E-learning: 70 questions to ask. Performance Improvement. 41 (4). 8-13. 257

Honey. P. (2001). "E-Learning: a performance appraisal and some suggestions for improvement." The Learning Organisation. Vol. 8(5). pp 200-202.

Islamic Republic of Afghanistan. Ministry of Education 2006. National Education Strategic Plan for Afghanistan. 2006-2010.pp60. 90

Kaur. K.. Abas. Z.W. (2004). "An Assessment of E-learning Readiness at the Open University Malaysia" International. Conference on Computers in Education . Retrieved on March 6. 2009 http://www.ejel.org/volume-4/v4-i1/arabee-zailan-and-mansurazmi.pdf

Le Boterf. G. (1994). De la competence. essai sur un attracteur etrange. Paris: Les editions d'organisation.

Massy, J., Harrison, T., & Ward, T. (2002). The European E-learning market: Summary report 2002. http://www.elearningage.co.uk/docs/Report2Summary.pdf.

McConnell International LLC. (2000). Risk E-Business: Seizing the Opportunity of Global E-Readiness Report. Retrieved on Feb. 24, 2008 from http://www.mcconnellinternational.com/ereadiness/EReadinessReport.htm.

McIsaac, M. S. (2002). The Internet, culture and community building. In D. Murphy, N. Shin & W. Zhang (Eds.), Advancing Online Learning in Asia, Hong Kong: The Open University of Hong Kong, 16-25.
Ministry of Education Singapore (2006). Are you ready for E-learning? Retrieved on Dec. 19, 2007 from http://www.moe.gov.sg/edumall/rd/research_summaries.htm.

Minton, M. C. (2000). Is your organization ready for E-learning? Seven key questions you need to answer. Communication Project Magazine, 3 (1). Retrieved on February 25, 2009, from. http://www.comproj.com/Minton.htm.

National Education Strategic Plan (NESP) 2006-2010. Ministry of Education, Afghanistan. Retrieved on June 17, 2009 from www.adf.gov.af/src/strategy_papers/NESP%20Final%20light.pdf

Oliver, R., & Towers, S. (2000). Up time: Information communication technology: Literacy and access for tertiary students in Australia, Canberra: Department of Education, Training and Youth Affairs. http://www.ascilite.org.au/conferences/melbourne01/pdf/papers/talavongana.pdf Retrieved May 25, 2009

Omwenga E.I & Rodrigues, A.J (2006). "Towards an Education Evaluation Framework: Synchronous and Asynchronous E-learning Cases". Journal of the Research Centre for Educational Technology. Vol 2, No. 1 (Spring 2006). http://www.rcetj.org/?type=art&id=4756& Retrieved on March 20, 2009.

Omwenga, E., Waema, T., & Wagacha, P. (June 2004). A model for introducing and implementing E-learning for delivery of educational content within the African context. African Journal of Sciences and Technology 5(1) 35-48

Pollard, E. & Hillage J. (2001) "Exploring E-learning", the Institute for Employment Studies (IES), Report 376.

Rodriguez, A.J (2004). "Health Informatics: Implications of Evaluation Models for developing countries". On: Luboobi, L. S., Mugisha, J.Y.T. and Kasozi, J., (eds.). Importance of Mathematical Modelling of Biological and Biomedical Processes. African Society for Biomathematics Series. No. 1. 79-94.

Rogers, E. M. (2003). Diffusion of innovations (5th Ed.), New York, NY: Free.

Rossi-Mori, A., & Ricci, F.L. (1988). "On the assessment of medical expert systems" in: Reinhoff, O., Piccolo, U. & Schneider, B., (eds.), Expert Systems and decision support in medicine, Lecture Notes in Medical Informatics, 36, Springer-Verlag, 1988, pp.292-297.
Russell, G. and Bradley, G. (1997). Teachers' computer anxiety: Implications for professional development. Education and Information Technologies, 2, 17-30.

Shea-Shultz, H., & Fogarty, J. (2002) Online learning today: Strategies that work. San Francisco, CA: Barrett-Koehler.

Sim, C. (2001). eLearning in the Asia/Pacific: Barriers and accelerators. Report number AP-AP22901H. Singapore: International Data Cooperation (IDC).

Sloman, M. (2001) "The E-learning revolution: from proposition to action", Chartered Institute of Personnel & Development, London. [Electronic Journal of E-learning Volume 2 Issue 2]– retrieved March 7, 2009 from http://www.ejel.org/volume-2/vol2-issue1/issue1-art13-jones.pdf

UNDP, 2007. CISCO Networking Academy Programme. Quarterly Project Report [1st Quarter, 2007]CISCO-USAID-UNDP NETWORKING ACADEMY ALLIANCE: Developing a Sustainable Cisco Networking Academy Program in Afghanistan. 01 January 2007 – 31 March 2007. Retrievedd March 09 from http://www.undp.org.af/WhoWeAre/UNDPinAfghanistan/Projects/Reports/ICT/ICT%20422210%20Q1%202007%20Progress%20Report.pdf

UNESCO, July 7, 2004: Educational Radio and TV Centre Re-Opened in Kabul

USAID (2007), USAID Afghanistan public website.
http://www.usaid.gov/locations/asia_near_east/countries/afghanistan/

Whitlock, Q. (2000) 'Tutor support in on-line learning: a report on a literature search', Guides for managers, Practitioners and Researchers, DfEE, Sheffield.

Ya'acob, A., Nor, N., and Azman, H. (2005). Implementation of the Malaysian Smart School: An Investigation of Teaching-Learning Practices and Teacher-Student Readiness. Internet Journal of e-lanaguage Learning and Teaching, 2(2), pp. 16-25. http://www.collecter.org/archives/2006_June/22.pdf. Retrieved on May 25, 2009.

Young, B. (2000). Gender Differences in Student Attitudes Toward Computers. Journal of Research on Computing in Education, 33(2), 204-217.

Yuen, A. and Ma, W. (2002). Gender Differences in Teacher Computer Acceptance. Journal of Technology and Teacher Education (2002) 10(3), 365-382.

APPENDIX A: ELRAIA SURVEY TOOL

E-LEARNING READINESS ASSESSMENT IN AFGHANISTAN (E-LRAIA)

Questionnaire For Users Engaged In Structured

E-Learning In Universities In Afghanistan

INSTRUCTIONS:

The purpose of this study is to examine the existing e-learning initiatives in Afghanistan and determine the country readiness for e-learning in higher education. Please answer all questions to the best of your ability. There are no wrong or right answers as what matters is your personal opinion. Kindly indicate by way of "checking the box" on the segment (number) that represents your opinion on the question. Save completed and work and send to me on tomuga@gmail.com.

SECTION A: GENERAL QUESTIONS

1. Respondent Name (Optional) .....
2. Cell Phone number (Optional) .....
3. Gender ☐ *Male* ☐ *Female*
4. Please specify your age range ☐ *15-20* ☐ *21-25* ☐ *26-30* ☐ *31-35* ☐ *36-40* ☐ *41-50* ☐ *51 an above*

5. What is your highest level of education? ☐ *Grade 12* ☐ *College* ☐ *Undergraduate* ☐ *Post Graduate* ☐

6. What is your field of study? .....

7. Please tick which of the following institution you belong to: ☐ *Kabul University* ☐ *Kabul medical University* ☐ *Kabul Polytechnic University* ☐ *Ministry of Women affairs*

8. Do you have access to a personal computer? ☐ *Yes* ☐ *No*

9. How long have you had access to a personal computer? ☐ *1-5 years* ☐ *6-10 years* ☐ *Over 11 years*

10. Have you heard about the E-learning programs? ☐ *Yes* ☐ *No.*

11. If yes, through what means? ☐ *Internet* ☐ *through a friend* ☐ *other means*

12. What does E-learning mean to you?

.....

.....

.....

13. Are you currently enrolled /engaged in any E-Learning programs in the University?
☐ *Yes* ☐ *No*

14. If answer to question 13 above is "Yes", please specify the program
.....

.....

15. Specify which of the user categories listed below that you belong to:
College Student ☐ *Intern* ☐ *Course instructor* ☐ *University Administrator* ☐

16. How long have you had interaction with the E-learning programs? *No interaction* ☐
1-6 months ☐ *7-12 months* ☐ *1-2 years* ☐ *over 2 years* ☐

17. Among the following E-learning tools, which ones are you familiar with?
☐ *Web based learning* ☐ *Virtual Classrooms* ☐ *Digital Collaboration* ☐ *Teleconference*

18. How many years of experience do you have with e-learning in the University?: ☐ *1-2 years*
☐ *3-5 years* ☐ *Over 6 years* ☐ *none at all*

19. How would you rate your experience with e-learning program you are enrolled in?
☐ *not useful at all* ☐ *Somehow useful* ☐ *useful* ☐ *extremely useful*

20. Do you have internet access? ☐ *Yes* ☐ *No*

21. If yes, how often do you access the internet? ☐ *Very often* ☐ *Often*
☐ *Sometimes* ☐ *Rarely*

22. What is your perception of e-learning readiness in higher education in Afghanistan?
☐ *not ready* ☐ *Somehow ready* ☐ *ready* ☐ *very ready*

SECTION B: TECHNICAL SYSTEMS PERSPECTIVE OF E-LEARNING (To be answered by Students and Course instructors)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. E-Learning Structure					
1. I can not benefit from E-Learning course without access to a computer	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Internet access is critical for E-Learning programs	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. E-learning programs requires adequate power supply	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Setting up E-Learning infrastructure require a lot of skilled technical support	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
5. E-learning software modules work well without failing	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
6. Constant internet interruptions hinder successful E-learning	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Process					
1. E-Learning courses are easy to use	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. The courses are exciting and motivating	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Moving from one module to another is very easy	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. The education content is well presented	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
5. Contents downloaded from other institutions work well without customization	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
6. Coursework provides me with links to other global academic networks	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Outcome					
1. E-Learning courses are fully compliant with the official University curricular	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. E-learning program provides practical skills useable on a day to day basis	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. The courses meet the MoE standards and requirements	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. I am able to apply skills learnt from E-Learning into other courses taught at the Univeristy	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

SECTION C: HUMAN PERSPECTIVES (Students and Course Instructors)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Structure					
1. My E-learning course is reasonably priced	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. I do not need extra skills to benefit from the course	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. I enjoy using the coursework	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. The labs are conducive to learning and well equipped	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
5. Online help is available at every stage of the coursework	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Process					
1. I am only able to access the course modules at specific time slots	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Lectures are always available online to answer questions and provide online help	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. The pace of learning is flexible and provides the ability to understand the concepts	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Access to the coursework provides me links to other e-learning networks	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Outcome	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
1. The E-learning experience has enhanced my overall academic performance in class	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. I prefer E-learning to other traditional courses offered at the University	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. E-learning has improved my computer skills and I have less dependence on technical personnel	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. I am fully satisfied with the E-Learning coursework	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

SECTION D: HUMAN PERSPECTIVES (To be answered by E-Learning Administrators and Managers only)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Structure					
1. Student's course registration is easy	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. The course modules do not require a lot of administrative support	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. E-learning provides lectures with global links to e-learning networks	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Lectures find it easy to customize the courses for better understanding	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Process					
1.The courses do not requires administrators presence all the time during the learning period	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Monitoring of teaching is much easier with E-learning	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Students performance and progress is much easier to manage	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Outcome					
1. Students enrolled in E-learning perform much better than those not enrolled in it.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Students in E-Learning have much more commitment to learning	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. The quality of instruction is improved through E-learning	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4 The E-learning graduates get job placement upon completion of course	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

SECTION E: EDUCATIONAL SYSTEM (Expected Impact)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Structure					
1. E-learning offers training courses for education management	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. New teaching methodologies are easy to learn	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Lectures tap into the global e-learning education network easily	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Modules are easily available for continuous professional development	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
5. Online help is available at every stage of the coursework	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Process					
1. Teaching methods mimic classical principles of instruction [pedagogy]	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. E-Learning enhances monitoring and evaluation of teaching	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Faculty teaching standards are improved	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Students acquire additional skills through interaction with E-Learning modules	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Outcome	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
1. Offers collaborative research opportunities for both students and lecturers	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Students have a stronger commitment to learning	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. New knowledge generation results	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Students appreciate the use of internet as a teaching tool	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

SECTION F: Express the extent to which you agree that the following factors affect implementation of e-learning in Universities in Afghanistan?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Structure of e-Learning					
1. Inadequate supply of electricity	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Lack of computer equipment	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Limited technical support capacity	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Insufficient internet bandwidth	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
5. Absence of localized content	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
6. Poor technology literacy	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
7. Low levels of English literacy	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
8. Availability of qualified professionals	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
9. Prohibitive costs of computer hardware and software	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Process of E-learning					
1. Prohibitive Government policies	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Lack of legislation and recognition of e-learning as a formal education delivery tool	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Inability to conform with the international practices and procedures of e-learning	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Lack of information and communication on e-learning	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. Outcome					
1. E-learning opportunities are not published	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
2. Successful E-learning programs are out of reach for ordinary citizens	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
3. E-learning course do not meet user expectations	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
4. Quality of E-learning is perceived as low compared to traditional methods of teaching	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

Any other comments:

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

Thank you so much for accepting to participate in this noble research exercise.

APPENDIX B: KEY INFORMANT INTERVIEW QUESTIONS

E-LEARNING READINESS ASSESSMENT IN AFGHANISTAN

Structured Key Informant Interview Questions

1. What factors exist within Afghanistan higher education systems that support the viability of E-Learning?
2. What is the impact of E-Learning on students in higher education institutions?
3. What is your perception of the level of E-learning readiness in Afghanistan higher Education Institutions?
4. To what extent have the following factors affected e-learning?
   - Technology and infrastructure
   - Content and content management
   - Social and cultural, Gender.
5. Comment on the following key issues / impediments in Afghanistan Higher Education System that can limit implementation of E-Learning:
   - Appropriate Physical Facilities, and technology Infrastructure in Universities
   - Teaching/Educational and Support Resources
   - Linkages
   - Professional Expertise
   - English Language Proficiency
   - Governance and Management
   - Education Policies and regulatory framework.
6. Any other comments:

Thank you so much for accepting to participate in this noble research exercise.

APPENDIX C: LIST OF INTERVIEWEES

The institutional stakeholders interviewed include :

1. GOA, Ministry of Higher Education policy and planning department
2. GOA, Ministry of Education –Dept of Technical & Vocational Education
3. Ministry of Education –SHEP/ EQUIP World Bank Projects
4. Research Fellows Program, Ministry of Education-Dept of Technical & Vocational Education
5. ANGEL and CISCO E-Learning Initiatives in 4 Afghan Universities
6. GOA, Civil Services Commission Training Institution
7. Education and Culture Project, Organizational for Integrated Development
8. Academic Board of Education
9. GOA, Ministry of Communications & IT, Information and Communication Technologies Dept
10. Kabul University, Kabul Polytechnic, Kabul Medical University and Kabul Education University

APPENDIX D: ELRAIA FREQUENCY TABLES – COMBINED

The frequency tables in this section contain tabulations of responses to each question in the E-LRAIA survey tool that were obtained from both the control and standard groups:

Note:

1. Frequency tables with no missing responses the percent column and the valid percent are the same, but always report the percentage in the valid column.
2. where there is non response(missing values), the percent column include the percentage of non response, while the valid percent column contains only the valid responses received and therefore is the accurate finding to report. Edit out (delete) the cumulative percent column.

Table 11: Type of Respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Standard	141	58.5	58.5	58.5
	Control	100	41.5	41.5	100.0
	Total	241	100.0	100.0	

Table 12: Gender of respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	188	78.0	78.7	78.7
	Female	51	21.2	21.3	100.0
	Total	239	99.2	100.0	
Missing	None response	2	.8		
Total		241	100.0		

Table 13: Respondents' Age Range

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-20	61	25.3	26.0	26.0
	21-25	154	63.9	65.5	91.5
	26-30	18	7.5	7.7	99.1
	31-35	1	.4	.4	99.6
	36-40	1	.4	.4	100.0
	Total	235	97.5	100.0	
Missing	None response	6	2.5		
Total		241	100.0		

Table 14: Highest level of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Grade 12	7	2.9	3.0	3.0
	College	114	47.3	48.3	51.3
	Undergraduate	95	39.4	40.3	91.5
	Post Graduate	20	8.3	8.5	100.0
	Total	236	97.9	100.0	
Missing	None response	5	2.1		
Total		241	100.0		

Table 15: Field of study

	Frequency	Percent	Valid Percent	Cumulative Percent
	1	.4	.4	.4
Agriculture	7	2.9	2.9	3.3
Art music	1	.4	.4	3.7
Business	2	.8	.8	4.6
Chemistry	5	2.1	2.1	6.6
Civil Engineering	3	1.2	1.2	7.9
Computer science	22	9.1	9.1	17.0
Computer Science	18	7.5	7.5	24.5
Economic	16	6.6	6.6	31.1
Electrical	1	.4	.4	31.5
Electronic	2	.8	.8	32.4
Engineering	14	5.8	5.8	38.2
English language	1	.4	.4	38.6
French Literature	1	.4	.4	39.0
Geo Science	6	2.5	2.5	41.5
Geography	1	.4	.4	41.9
Interplay	1	.4	.4	42.3
Islamic law	1	.4	.4	42.7
Journalism	16	6.6	6.6	49.4
Law	7	2.9	2.9	52.3
Law and political Science	2	.8	.8	53.1
Literature	30	12.4	12.4	65.6
Medical	3	1.2	1.2	66.8

Medical Microbiology	1	.4	.4	67.2
Medicine	10	4.1	4.1	71.4
Medicine Advanced	3	1.2	1.2	72.6
Medicine Basic	1	.4	.4	73.0
Medicine Basic IT	1	.4	.4	73.4
Pharmacy	2	.8	.8	74.3
Psychology	5	2.1	2.1	76.3
Science	34	14.1	14.1	90.5
Social Science	11	4.6	4.6	95.0
Teacher /training	3	1.2	1.2	96.3
Veterinary	9	3.7	3.7	100.0
Total	241	100.0	100.0	

Table 16: Respondents Academic institutions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Kabul University	182	75.5	75.5	75.5
	Kabul Medical University	28	11.6	11.6	87.1
	KabulPolytechnic University	4	1.7	1.7	88.8
	Ministry of Women affairs	27	11.2	11.2	100.0
	Total	241	100.0	100.0	

Table 17: Access to a personal computer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	212	88.0	89.5	89.5
	No	25	10.4	10.5	100.0
	Total	237	98.3	100.0	
Missing	None response	4	1.7		
Total		241	100.0		

Tab e 18: Period of access to a personal Computer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-5 yrs	181	75.1	82.3	82.3
	6-10 yrs	34	14.1	15.5	97.7
	Over 11 yrs	5	2.1	2.3	100.0
	Total	220	91.3	100.0	
Missing	None response	21	8.7		
Total		241	100.0		

Table 19: Knowledge about the E-Learning Programs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	166	68.9	70.0	70.0
	No	71	29.5	30.0	100.0
	Total	237	98.3	100.0	
Missing	None response	4	1.7		
Total		241	100.0		

Table 20: Means of E-learning Knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Internet	93	38.6	56.7	56.7
	Through a friend	48	19.9	29.3	86.0
	Other means	21	8.7	12.8	98.8
	All of the above	2	.8	1.2	100.0
	Total	164	68.0	100.0	
Missing	None response	77	32.0		
Total		241	100.0		

Table 21: Meaning of E-learning to respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
	120	49.8	49.8	49.8
Advance IT	3	1.2	1.2	51.0
Angel/IT	9	3.7	3.7	54.8
Basic IT	19	7.9	7.9	62.7
Chatting	1	.4	.4	63.1
Communication	1	.4	.4	63.5
Computer	2	.8	.8	64.3
Computer by internet	1	.4	.4	64.7
computer learning	12	5.0	5.0	69.7
DVD	1	.4	.4	70.1
Education	1	.4	.4	70.5
Electronic learning	27	11.2	11.2	81.7
GIS	1	.4	.4	82.2
HTML,CSS	1	.4	.4	82.6
ICD	1	.4	.4	83.0
Information	1	.4	.4	83.4
Internet	8	3.3	3.3	86.7
Internet Skills	5	2.1	2.1	88.8
IT Information	1	.4	.4	89.2
IT Program	12	5.0	5.0	94.2
IT/Information	1	.4	.4	94.6
Learning computer	2	.8	.8	95.4
Lesson from computer	1	.4	.4	95.9
Online studying	6	2.5	2.5	98.3
Use internet for learning	4	1.7	1.7	100.0
Total	241	100.0	100.0	

Table 22: Users E-learning programs in the University

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	118	49.0	49.0	49.0
	No	123	51.0	51.0	100.0
	Total	241	100.0	100.0	

Table 23: Specific user E-learning oriented programs

	Frequency	Percent	Valid Percent	Cumulative Percent
	124	51.5	51.5	51.5
Advance Program	4	1.7	1.7	53.1
Advanced IT	14	5.8	5.8	58.9
Angel IT	18	7.5	7.5	66.4
Basic IT	34	14.1	14.1	80.5
CAN	1	.4	.4	80.9
CCNA	1	.4	.4	81.3
CISCO	9	3.7	3.7	85.1
Computer info	1	.4	.4	85.5
CSI	2	.8	.8	86.3
CSS MS Office	1	.4	.4	86.7
Elec Learning	5	2.1	2.1	88.8
Electronic	1	.4	.4	89.2
HIML	1	.4	.4	89.6
IME	1	.4	.4	90.0
Internet learning	1	.4	.4	90.5
IT	2	.8	.8	91.3
IT Advance	1	.4	.4	91.7
IT Basic	2	.8	.8	92.5
IT Program	2	.8	.8	93.4
IT Skills	1	.4	.4	93.8
Learning computer	1	.4	.4	94.2
Long man	1	.4	.4	94.6
MCSE	1	.4	.4	95.0
Microsoft	1	.4	.4	95.4
Networking	1	.4	.4	95.9
Office program	2	.8	.8	96.7
Online	2	.8	.8	97.5

Web Based	3	1.2	1.2	98.8
Web Designing	1	.4	.4	99.2
Web Learning	1	.4	.4	99.6
XHTML	1	.4	.4	100.0
Total	241	100.0	100.0	

Table 24: User categories respondents belong to:

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	College student	184	76.3	77.6	77.6
	Intern	8	3.3	3.4	81.0
	Course Instructor	15	6.2	6.3	87.3
	University Administrator	30	12.4	12.7	100.0
	Total	237	98.3	100.0	
Missing	None response	4	1.7		
Total		241	100.0		

Table 25: Period of interaction with the E-learning programs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No interaction	99	41.1	41.9	41.9
	1-6 months	73	30.3	30.9	72.9
	7-12 months	37	15.4	15.7	88.6
	1-2 yrs	11	4.6	4.7	93.2
	Over 2 yrs	16	6.6	6.8	100.0
	Total	236	97.9	100.0	
Missing	None response	5	2.1		
Total		241	100.0		

Table 26: E-learning tools, which ones users are familiar with

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Web based learning	115	47.7	79.9	79.9
	Virtual classroom	14	5.8	9.7	89.6
	Digital collaboration	10	4.1	6.9	96.5
	Teleconference	5	2.1	3.5	100.0
	Total	144	59.8	100.0	
Missing	None response	97	40.2		
Total		241	100.0		

Table 27: Years of experience with E-learning in the University?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-2 yrs	85	35.3	37.1	37.1
	3-5 yrs	19	7.9	8.3	45.4
	Over 6 yrs	2	.8	.9	46.3
	None at all	123	51.0	53.7	100.0
	Total	229	95.0	100.0	
Missing	None response	12	5.0		
Total		241	100.0		

Table 28: Respondents experience with E-learning program enrolled in

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not useful at all	18	7.5	12.3	12.3
	Somehow useful	9	3.7	6.2	18.5
	Useful	80	33.2	54.8	73.3
	Extremely useful	39	16.2	26.7	100.0
	Total	146	60.6	100.0	
Missing	None response	95	39.4		
Total		241	100.0		

Table 29: Do you have internet access?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	200	83.0	84.0	84.0
	No	38	15.8	16.0	100.0
	Total	238	98.8	100.0	
Missing	None response	3	1.2		
Total		241	100.0		

Table 30: Frequency of access to the internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very often	46	19.1	19.9	19.9
	Often	45	18.7	19.5	39.4
	Sometimes	91	37.8	39.4	78.8
	Rarely	49	20.3	21.2	100.0
	Total	231	95.9	100.0	
Missing	None response	10	4.1		
Total		241	100.0		

Table 31: Perception of E-learning readiness in Afghanistan

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not ready	70	29.0	29.5	29.5
	Somehow ready	42	17.4	17.7	47.3
	Ready	81	33.6	34.2	81.4
	Very ready	44	18.3	18.6	100.0
	Total	237	98.3	100.0	
Missing	None response	4	1.7		
Total		241	100.0		

Table 32: Technical Systems Perspectives of E-Learning

	N	Mean	Std. Deviation
Internet access is critical for E-learning programs	225	3.68	1.091
E-learning programs requires adequate power supply	229	3.80	.961
Setting up E-learning infrastructure require a lot of skilled technical support	226	3.85	.916
E-learning software modules work well without failing	226	3.43	1.053
Constant internet interruptions hinder successful E-learning	224	3.71	.919
Technical Perspective-Structure	**229**	**3.70**	**.555**
E-learning Courses are easy to use	227	3.75	.992
The Courses are exciting and motivating	227	3.85	.978
Moving from one module to another is very easy	221	3.45	.955
The education content is well presented	227	3.63	.961
Contents downloaded from other institutions work well without customization	225	3.32	1.107
Coursework provides me with links to other global academic networks	222	3.81	.967
Technical Perspective-Process	**229**	**3.70**	**.555**
E-learning courses are fully compliant with the official University curricular	221	3.61	1.011
E-learning program provides practical skills useable on a day to day basis	220	3.85	.765
The courses meet the MoE standards and requirements	223	3.58	.906
I am able to apply skills learnt from E-learning into other courses taught at the University	224	3.69	1.058
Technical Perspective-Outcome	**229**	**3.70**	**.555**

Table 33: Human Perspectives - Students and Course Instructors

	N	Mean	Std. Deviation
My E-learning course is reasonably priced	153	3.69	.963
I do not need extra skills to benefit from the course	155	2.55	1.325
I enjoy using the coursework	150	4.21	.808
The labs are conductive to learning and well equipped	148	3.37	1.180
Online help is available at every stage of the coursework	153	3.48	1.323
Human Perspective(Students) - Structure	**156**	**3.45**	**.768**
I am only able to access the course modules at specific time slots	151	3.62	1.005
Lectures are always available online to answer questions and provide online help	150	3.49	1.116
The pace of learning is flexible and provides the ability to understand the concepts	150	3.75	.859

Access to the coursework provides me links to other E-learning networks	150	3.81	1.041
Human Perspective(Students) - Process	**152**	**3.67**	**.713**
The E-learning experience has enhanced my overall academic performance in class	149	3.92	.962
I prefer E-learning to other traditional courses offered at the University	149	4.03	.896
E-learning has improved my computer skills and I have less dependence on technical personnel	150	4.01	.882
I am fully satisfied with the E-learning coursework	151	3.91	1.039
Human Perspective(Students) – Outcome	**154**	**3.97**	**.681**

Table 34: Human Perspectives - Administrators and Managers

	N	Mean	Std. Deviation
E-learning offers training courses for education management	113	3.60	.921
New teaching methodologies are easy to learn	113	3.74	1.016
Lectures tap into the global e-learning education network easily	110	3.66	.989
Modules are easily available for continuous professional	112	3.55	1.021
Online help is available at every stage of the coursework	111	3.69	1.085
Educational System - Structure	**113**	**3.66**	**.702**
Teaching methods mimic classical principles of instruction {pedagogy}	110	3.56	1.045
E-learning enhances monitoring and evaluation of teaching	110	3.70	.873
Faculty teaching standards are improved	110	3.81	.991
Students acquire additional skills through interaction with E-learning modules	110	3.89	.850
Educational System - Process	**112**	**3.74**	**.676**
Offers collaborative research opportunities for both students and lecturers	111	3.95	.872
Students have a stronger commitment to learning	108	3.78	.921
New knowledge generation results	109	3.99	.833
Students appreciate the use of internet as a teaching tool	105	4.03	.985
Educational System – Outcome	**112**	**3.93**	**.703**

Table 35: Educational System

	N	Mean	Std. Deviation
E-learning offers training courses for education management	113	3.60	.921
New teaching methodologies are easy to learn	113	3.74	1.016
Lectures tap into the global e-learning education network easily	110	3.66	.989
Modules are easily available for continuous professional	112	3.55	1.021
Online help is available at every stage of the coursework	111	3.69	1.085
Educational System - Structure	**113**	**3.66**	**.702**
Teaching methods mimic classical principles of instruction {pedagogy}	110	3.56	1.045
E-learning enhances monitoring and evaluation of teaching	110	3.70	.873
Faculty teaching standards are improved	110	3.81	.991
Students acquire additional skills through interaction with E-learning modules	110	3.89	.850
Educational System - Process	**112**	**3.74**	**.676**
Offers collaborative research opportunities for both students and lecturers	111	3.95	.872
Students have a stronger commitment to learning	108	3.78	.921
New knowledge generation results	109	3.99	.833
Students appreciate the use of internet as a teaching tool	105	4.03	.985
Educational System – Outcome	**112**	**3.93**	**.703**

Table 36: Technology Factors

	N	Mean	Std. Deviation
Inadequate supply of electricity	207	3.46	1.051
Lack of computer equipment	207	3.60	1.074
Limited technical support capacity	206	3.61	1.089
Insufficient internet bandwidth	206	3.61	1.052
Absence of localized content	204	3.42	.977
Poor technology literacy	207	3.58	1.093
Low levels of English literacy	206	3.60	.992
Availability of qualified professionals	204	3.69	1.022
Prohibitive costs of computer hardware and software	208	3.77	1.003
Technology - Structure	**208**	**3.59**	**.667**
Prohibitive Government policies	202	3.35	1.106
Lack of legislation and recognition of e-learning as a formal education delivery tool	205	3.48	.988
Inability to conform with the international practices and procedures of e-learning	204	3.67	.976
Lack of information and communication on e-learning	202	3.71	1.106
Technology - Process	**205**	**3.55**	**.764**
E-learning opportunities are not published	187	3.50	.997
Successful E-learning programs are out of reach for ordinary citizens	186	3.55	1.085
E-learning course do not meet user expectations	184	3.29	1.120
Quality of E-learning is perceived as low compared to traditional methods of teaching	188	3.36	1.032
Technology - Outcome	**190**	**3.43**	**.754**