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Analysing the Effectiveness of IT Strategy in Libyan Higher Education Institutes

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ABSTRACT

The use of Information and Communications Technology (ICT) has increased rapidly in the entire education sector and teaching process. Libyan universities, and most Libyan Higher Education Institutes (LHEIs), are trying to update their processes and to make Information Technology (IT) a major factor in their education systems. This paper will present an analysis of feedback from a group of Libyan students studying abroad, in response to questions about their attitude, awareness and motivation with regard to IT. It will then evaluate the ICT gap in Libya, using a SWOT analysis model, which indicates the main issues for Libyan HEIs and significant features of online teaching and learning. The paper also discusses some online learning activities that can be used in the design of many types of courses, modules and programmes. In addition, the effectiveness of different IT strategies, and the numerous requirements for the transition from traditional to online learning are addressed in the narrative, including a set of proposals that could contribute to the use of ICT and IT in achieving the goals of educational curricula in Libya. Finally, the authors suggest a number of recommendations for the effective design and successful implementation of IT strategies in Libyan HEIs.

KEYWORDS:

E-learning, Information and communication technology (ICT), Libya, student attitudes, student satisfaction.

1. INTRODUCTION

The civil war in Libya in 2011 crippled the country's economy and has badly affected its telecommunications sector. It is estimated that more than US\$1 billion's worth of telecom infrastructure has been destroyed, including about 20% of the country's cell sites. Reconstruction efforts are underway, and with an estimated 76% growth in GDP, the country's economic output is expected to return to pre-war

Levels[1]. Libya has a good rating for literacy in the context of the Arab world, according to the United Nations Human Development Index [2]. Libya remains at the top of the list of African countries in terms of education, not only geographically, but also strategically. Libya has always been keen to ensure access to appropriate education for all members of its society, male and female. The government plans to improve and develop the ICT infrastructure of Libya, and it seeks to develop and renovate the entire educational process, including the development of curricula and updating its scientific content. The adoption of ICT within education, including higher education, is an essential factor in its overall development plans.

Kenan et al. [3] discuss the pedagogical, technological and attitudinal challenges related to this matter. The introduction of online learning programmes in the educational system of a specific country must take into consideration the social and cultural aspects as well as the technical infrastructure of that society; therefore these elements will play a significant role in the future success of the higher education system. The significance of these factors differs from one society to another, according to the values of the society, and its customs and traditions.

The Libyan Department of Education has emphasized that ICT will create new methods of learning and training, and has the potential to enhance the management of, and improve the level of, education in Libya. The global spread of ICT has enabled people to use technology in all spheres of life, be it at work, at home, in schools or in the field of entertainment. This has led to an increased number of learners and trainers in Libyan universities, institutes and colleges delivering distance-learning courses [4].

There is a need for professional technicians who are well trained in ICT, capable of using ICT systems and developing them. Locally based technicians are also required to maintain equipment and tools leading e-fields such as e-learning, e-teaching, e-business, e-healthcare and e-government and to make them successful [5]. The proliferation of such e-fields has been growing since the computer was developed and made available for both personal use and as a tool to deliver material. The use of the computer in education has hugely increased due to the availability of such technology. The adoption and development of Information Technologies (ITs) as tools will provide students in Libyan Higher Education Institutes (LHEIs) with the opportunity to use a wide variety of applications and to communicate through all available forms of technology.

The advantages of ICT for both academics and the higher education system are countless. It can offer communities access to digital sources and references which are not available locally or in hard copy; it can provide learners and tutors with the ability to communicate remotely without needing to be present in the classroom, give access to interactive tutorials, and also make it easier to obtain educational equipment for inventions and designs [6]. However, the greatest benefits of ICT are online learning, whereby students have access to material at any time and have no excuse for missing courses unless they do not have an Internet connection [7]. Online learning courses offer the chance for students who cannot attend class to follow the lesson regardless of location or time. Students can obtain announcements, access assignments, take notes, contribute to discussion boards, chat and study with other students, and create their own schedules [8].

2. ATTITUDE, AWARENESS AND MOTIVATION OF LIBYAN ICT USERS IN LHEIS.

Teaching and learning are the cornerstones of any HEI. However, maintaining the quality of such processes is a continuous challenge. The main teaching methods used by Libyan HEIs are traditional for three main reasons: the annual increase in the number of students enrolled,

restrictions on financial resources and staff training, and the administrative system [9].

In spite of the known weaknesses of such an approach, traditional teaching has provided teachers with the means to deliver the required course material to an ever-increasing number of students, and to provide those students with a clear-cut minimum of material such that they can easily memorize it [10]. Therefore, postgraduate students cannot generally contribute to the learning process in the classrooms: they only listen and take notes. Furthermore, the usage of new technology in Libyan HEIs, such as computers and multimedia in general, is way behind international best practice.

Although the introduction of online learning to Libyan HEIs faces serious challenges, the government has been concentrating on ICT, which has consequently opened up an opportunity for the higher education sector to adopt online learning. There are further studies regarding these challenges. The government started a 60 million e-learning pilot project in September 2009, as a sign of approval and support [8]. Due to the advantages of ICT, several traditional structures are shifting towards the online environment [11]. Libyan HEIs could also benefit from the notion of active learning and develop it, whereby the attitude of students will change as they become not only listeners in the class, but can also interact with the teacher and discuss together the knowledge offered by the subject [12].

However, it is widely agreed among a number of Libyan educators, including Rahema et al. [13]; Elzawi et al. [14]; Kenan et al. [9] and Othman [15] that students on postgraduate programmes in Libyan HEIs encounter the following difficulties:

1. Lack of clear philosophy and objectives;
2. Absence of a plan for building the human resources needed by society;
3. Absence of effective administration;
4. Lack of staff development in Libyan HE. It is only recently that structured staff development has become available to academic staff;
5. Lack of a common policy (based on scientific and international criteria) regarding the acceptance of students onto a research degree;

6. Absence of any effective research contribution from academic staff members, due to their high teaching load;
7. Shortage of research activities in science and engineering in Libyan HEIs due to the lack of necessary facilities;
8. Ineffectiveness of postgraduate programmes and inability to realise their goals and objectives;
9. Reliance on traditional teaching methods;
10. Reliance on traditional methods for assessing student performance, which do not consider the real readiness, capability and skills of the student.

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

3. EVALUATION OF ICT GAP IN LIBYA:

The Libyan business executive survey/global competitiveness report (LBES/GCR) ranks Libya 97th out of 111 countries in university/industry research collaboration [16].

3.1 SWOT Analysis Model:

SWOT is an acronym for **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats. The ‘opportunity’ and ‘threat’ should both focus on possible future consequences, whilst ‘strength’ and ‘weakness’ may involve the generation of a list of both positives and negatives of the analysed situation.

However, Scott [17] underlines that “*people who use SWOT might conclude that they have done an adequate job of planning and ignore such sensible things as defining the firm's objectives for alternate strategies*”. [17].

Thus, it is also important to consider various solutions after examining the results of SWOT analysis.

The SWOT analysis model was designed in 2012, based on experiences with LHEIs in general, [18], and in particular on experiences at Tripoli university where it considered the perspectives of instructors, students, administrators and technical staff towards using web-based instruction.

The information was obtained through observations, experiences, many survey results and other studies relating to students, academics, administrators and technical staff, and represents many attempts to analyse IT implementation by using the SWOT model in different HEIs in Libya in the past. This paper will present the updated SWOT model as shown in Figure 1.

The conclusions of modern SWOT analysis should help managers and users to choose a convenient IT strategy for education. The aspects which should be considered are improvement of learners' knowledge, learning outcomes, efficiency of the teaching and learning processes, and reduction of costs.

3.2 SWOT Model Strategy:

This indicates the main issues for Libyan HEIs which need to be addressed, which are as follows:

- *The annual increase in the number of students enrolled*
- *Restrictions on financial resources and staff training*
- *The administrative system (mismanagement)*
- *Development the traditional method in the teaching & learning to e- (teaching & learning).*

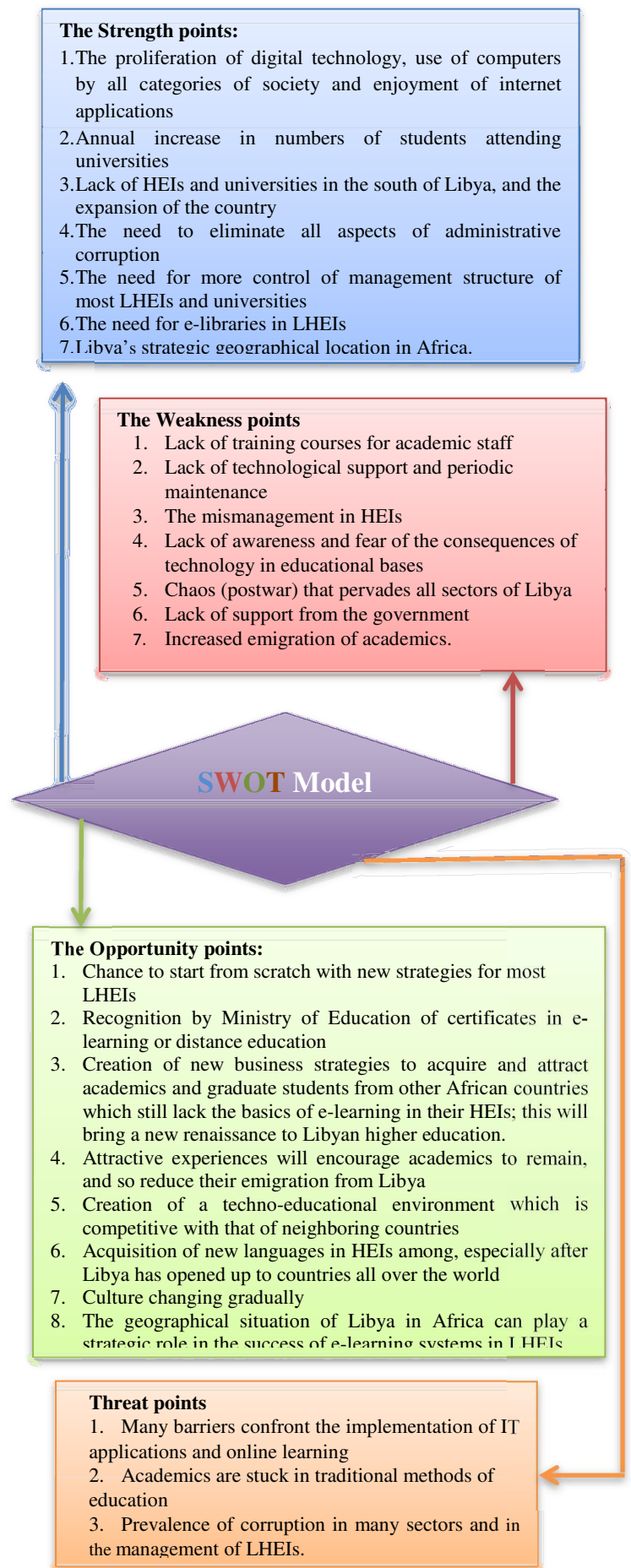
The SWOT analysis results show that the strategy is useful for determining methods to achieve successful implementation of IT in the Libyan universities. This strategy aims to help decision makers at departmental level to decide on opportunities with respect to the experience as well as the perceptions of instructors, students, administrators and technical staff about using web-based instruction with the institution. An online learning and IT strategy will offer a framework for assessment of the impact of all the implementation steps. The strategy should be sufficiently flexible to accommodate changes and developments in online learning products, services and technology. The implementation steps in an official setting require inclusive strategic planning.

Having presented the strengths, weaknesses, opportunities and threats for the new IT strategy, there are other factors which must be considered in relation to online learning within the university teaching process.

Figure (1): SWOT model analysis of online learning implementation in Libyan's HEIs. 2012 [18].

3.3 Significant Properties of Online Learning in University Teaching:

The main features and benefits of online learning in university teaching are that it provides a new culture, which can be called a 'digital culture'; it helps in providing educational opportunities for



various segments of society; it provides

education at any time and in any place; it contributes to the development of thinking, and it enriches the learning process. Education through electronic mail helps universities to reduce the cost of education, and the greater the number of students, the more students will come to rely on this approach.

By featuring easily updated sites and educational programs, and modifying and updating the information provided therein, as well as speeding up the transfer of this information to students depending on the digital information network, the possibility of students and their teachers communicating to exchange views, experiences and perspectives is greatly increased. For many students, this will give them the freedom and boldness to express themselves. Online learning overcomes the problem of increasing numbers in narrow halls and the lack of available resources in colleges, and especially in theoretical disciplines, students can be given continuous feedback during the learning process. It facilitates students' access to a mentor at any time, as well as to the diversity of various sources of learning. The teacher's work can focus on teaching students, and by reducing effort in school; the system provides a means of delivering a consistent and high quality education to an unpredictable number of students in a variety of places. Students and teachers will gain sufficient capacity to use modern technologies, information technology and computers, and will be able to access scientifically designed material based on interactive multimedia or hypermedia (voice, pictures, movies, comics), all of which will be reflected in its impact on students' lives and learning. [19]

There are many courses that are taught through online learning, and these modules are characterized by providing opportunities for study that are flexible in timing and content. Such programmes allow the development of a timetable suitable for the performance of the learner, and the possibility of communication between teacher and learner, which may be synchronous or asynchronous, individual or collective, which gives a new dimension to the learning style. They offer the facility to individualize education and take into account individual differences, whereby the learner chooses the content, time, learning resources, learning methods, teaching aids and evaluation

methods that suit them. For example, content on the Internet is not only displayed in the form of text, but can be viewed using multimedia such as images, sound and movement as well as text.

Online learning is characterized by many features that should encourage educators to use them. Firstly, there is an abundance of sources of information such as electronic books, periodicals, databases, encyclopaedias and educational sites. Secondly, synchronous direct contact can be used, where communication can be made by several methods at the same time, including conversational writing (relay-chat) where the participant writes the name of the person he wants to address by using the keyboard and the respondent sees what is written at the same moment. In the same way, directly afterwards the respondent can write what he wants to say. Another method is by conversational voice (voice-conferencing) where voice conversations can take place at the same time by telephone via the Internet. A further method is conversational voice and video communication (video conferencing), where the communication is live on air using sound and image. A third feature of online learning is the opportunity for indirect (asynchronous) contact, where learners can communicate among themselves indirectly, without needing to be present at the same time. This can be done using several means, including e-mail and voice-mail. [20]

3.3.1 Online Learning Activities:

Educational activities used in online learning to achieve the objectives of the school curriculum can be divided into three main areas as follows:

A. *First area: communication and exchange of information between individuals.* This area includes the following educational activities:

- **Online communication:** Activities of this kind include correspondence via e-mail and participation in dialogue and debate through mailing lists, news groups, newsletters and electronic forums.
- **Virtual classroom:** in which the learner is able to communicate with students in another class (inside or outside the school) to discuss specific topics.

- **Invited guests:** where scholars and experts are invited to answer questions raised by learners via e-mail.

- **Contact with experienced experts:** interaction with educated persons, whether experts or scholars, who are able via e-mail to answer questions that students might have.

- **Services to answer questions:** whereby many companies, educational institutions, government agencies, associations and professional organizations can answer questions raised by learners over the Internet. [21]

B. Second area: collection and analysis of information. This area includes the following educational activities:

- **Exchange of information:** through e-mail and the www, teachers and learners can participate in summarizing books, reports and news.

- **Creation of databases:** in which information is gathered from a variety of sources and arranged in databases for later use by multiple participants.

- **Common data analysis:** this involves examining and analyzing data obtained from multiple sources in order to classify and gain access to specific patterns and trends which can be used in practice.

- **Electronic publishing:** reports are collected together with similar articles and then posted on the Internet.

C. Third area: problem solving. This area includes the following educational activities:

- **Finding information:** learners are asked to solve a problem and provided with access to a variety of information sources in order to detect and identify relevant data.

- **Solving problems simultaneously:** learners who are in different locations work independently to solve a problem, and then are briefed to ask each other about methods which they applied to find a solution.

- **Means of online learning:** there are many ways to achieve students' learning objectives, such as mail, module-mail, e-books and others.

- **E-module:** This is one of the most important applications for the use of information and communications technology in the educational process. E-module allows the use of any media, such as text, image and graphics or sound and movement, which can be used to design activities

and educational materials depending on access to computers and the Internet.[8]

- **The importance of e-module:** it is open 24 hours a day, seven days a week and during holidays; thus there is no limit to time or place of use, as the student can access it at any time, day or night from anywhere in the world. It does not require access to classrooms, and it is not necessary that computers are available in the university or school, because the material can be used from home. Students can use it several times and look at the scientific material of the course and lectures constantly. This gives the student a positive and active role in the online module, and increases the process of interaction and communication between the teacher and students, since each student contributes to the preparation of the scientific material with the module and is able to express his opinion and comment on the submissions made by other students. It provides an opportunity for students to access a wealth of information, and can be used by students from all over the world, giving them also the opportunity to learn about different cultures. In addition to scientific learning, it allows students to gain computer skills. The process is characterized by flexibility and provides opportunities to enrich and audit learning, whereby the teacher can use multiple methods of teaching, such as simulation, exploration, experience-based learning and individual therapy. If teachers are appropriately trained in the use of well-designed tests, they will be able to diagnose the difficulties that hinder students' mastery of a certain point, and provide them with explanations and additional or alternative training to be proficient in that point. The teacher facilitates the correct tests and assignments, which offer him the facility to collect statistics on student progress both as individuals and as a group. It also allows the parents of the students to familiarize themselves with the scientific material presented in module-mail and to see their children's results first hand. [11]

3.3.2 Types Of Courses and Modules:

There are several types of e-courses and e-modules. The most significant of these are listed below, together with an indication of how they may be used.

(1) E-module not based on the Internet: This type of module involves a set of software that enables the teacher to design activities; for example, Author Plus facilitates the design of activities according to the inclinations and abilities of students who are studying the module. These programs can be used to design exercises for one lesson or training for an entire course, and are accessible for use by teachers with only basic computer skills. All that is required is a preliminary understanding of commands for Windows.

The module consists of programs, which are not designed to be based on the Internet, and comprises two versions - one which the teacher uses to prepare the training, and a copy, which the student uses to solve exercises and answer questions. The teacher's version is on a computer of its own, and is not used or seen by the students, whilst the student version is on a special computer which allows the teacher to see it. The student version is loaded on the students' computers, and they cannot change, erase or modify exercises prepared by the teacher, or add their own exercises. The program has its own database, and when the teacher sets any exercises or tests, the results are stored in the database. This can include longer exercises, or tests with different formats, such as fill the gap tests, multiple choice or reordering tests etc. The teacher can add question or phrases to the text, or features such as pictures, animations or extracts from films or music, and can preview the sound effects and images associated with these before storing them permanently. It is possible to set the time for reading and student response to questions, as well as the time to open the text. It can also correct student responses in several ways: immediate correction, which lets the student know whether the response is right or wrong after each question, or deferred correction, where the student is told whether the responses are right or wrong after completing answers to all the questions. It can allow the student to choose the response method he prefers, and give the student the percentage of correct responses, with comments on the level of performance. Students can be given the correct answer with an explanation of the errors, which occurred during the course of answering questions. There is also the option to offer hints to help the student in choosing the correct answer. [15]

The program presents a set of lists at the top of the screen offering commands or instructions in MS Word, and a group of small windows inside the computer screen gives the teacher's instructions, texts and questions. There are a range of options that determine the mechanisms and functions that can be used in the preparation of the lesson, such as a list of types of questions and quality of feedback, quality of training correction and whether this should be temporary or not, and options to add effects such as sounds, images and colours.

(2) Online module based on the Internet: This type of module is based on a simple Internet format and contains a set of drawings and texts for the module, a set of exercises and tests, and records of test scores. The module may be developed to include animation, simulation, audio and visuals, and offers the possibility to add links to scientific material which can be found on the Internet or the World Wide Web. The Internet-based module consists of a set of tools that enable the student to communicate with the teacher and with his fellow students, and to look at and participate in the information relating to the module by using the following tools: home module, tools module, academic calendar, bulletin board, panel discussion, room dialogue and module-specific information. It consists of scientific course content written with accompanying vocabulary and multimedia, and the scientific material can take the form of reading, tasks, lectures, special instructions, glossary, notes and so on. It may include visual and audible material, photos, simulations prepared by the computer, slide shows, attached documents, notes and images, and topics are organized in the form of files and folders with links, which lead students to different scheduled classes. [21]

3.3.3 Programs That Can be Used in The Design of E-courses:

There are specialized programs and websites on the Internet which can be used to design lessons and modules by making use of private material, such as Program Author Plus, which is used in the design of lessons and modules to teach English language, and the program Hotpotatoes, which is used in the design of read-only lessons and modules. There are programs available that

can be used in the design of any module in any discipline, such as Macromedia and Authorware, and programs such as PowerPoint and Netscape Communicator can be used in the design of lessons and presentations that can be used either on the Internet or outside the network. Here the teacher has complete control over the design process, and can add texts, questions, still and moving images, sounds, music, links, etc. [22].

3.4 Requirements for use of the online module:

The requirements are as follows:

- A PC computer; operating system Windows 95, 98 or 2000; 23 MB memory; modem with a speed of at least 28.8 kbps; sound card; screen clarity of 600 x 800 pixels; amplifier; floppy and compact disks; software programs such as Realplayer, Acrobat Reader, InterVideo, Win DVD); browsers, such as Internet Explorer; Internet access and e-mail subscription.

- A camera and special software with which the student and teacher can capture and send images, a microphone and a suitable program to enable transmission and reception of voice for both student and teacher. A program that enables the student and the teacher to send and receive visual and auditory images, and a program that enables students in a particular location to view a picture of students in another location. Also a program that enables students in a particular location to change the image of students in another location. Authoring software, such as Author Plus, Hotpotatoes or Macromedia Authorware. Programs to prepare a slide presentation and visualization, such as PowerPoint, and an image re-design program such as Adobe Photoshop.

In addition to the above, there are some skills which both the teacher and students should be familiar with, including:

- Ability to use commands (Windows)
- Ability to use Word
- Ability to download software from the Internet and CD-ROMs
- Ability to move from one program to another at the same time
- Ability to use e-mail
- Understanding of some Internet terms

- Ability to search for a particular subject in particular locations
- Ability to communicate in writing.

The above considerations should be taken into account to increase the effectiveness of online modules. [19].

4. RESEARCH METHODOLOGY:

The researcher is pleased that the qualitative and quantitative data suited her study needs; a within-stage mixed model research approach was selected to gather these data. Therefore, the researcher used a questionnaire tool to collect both qualitative and quantitative data by providing open and closed questions. The use of a questionnaire is supported by research done by Johnson and Christensen in 2007 [23], which states that, "An example of within-stage mixed model research would be where you used a questionnaire during data collection that included both open-ended (i.e., qualitative) questions and closed-ended (i.e., quantitative) questions".

Mixed methods were selected to suit study needs within-stage to gather data. A questionnaire was sent to Libyan students in different areas in the UK by e-mail.

5. FINDINGS

5.1 Computers usage by mode of study and age:

As could be expected, analysis of use of computers by age of students discloses strong links with the mode of study, as younger students (especially students aged 21–35) were full-time students. As Figure 2 illustrates, full-time students used a computer every day and had a strong tendency to using technology compared with other students, such as part-time students. Important differences were noted, for example:

- Very rarely, if ever (12% compared with 73%);
- Occasionally (19% compared with 18%);
- Every day, I'm addicted! (69% compared with 73%).

However, there was a similar number who reported occasional use (19% compared with 18%); notably, younger students were more likely to use computers for different reasons compared with students aged 35+.

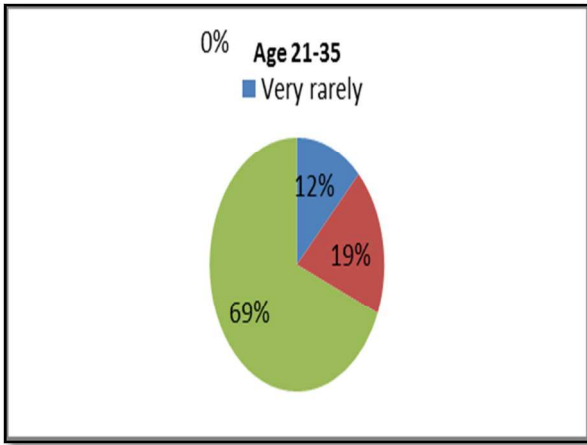


Figure 2: Computer use by full-time students aged 21-35

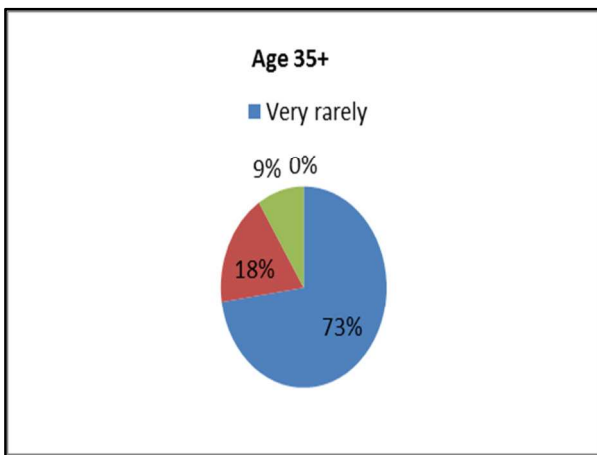


Figure 3: Computer use by part-time students

5.2 Usage of computers by gender:

Analysis of the data revealed a set of significant differences in the way males and females used computers: males were more likely than females to use computers. These differences in computer usage between males and females could be related to the different subjects that students tend to study. The study suggested that males were more likely to study subjects which related to usage of computers, or which required students to use computers for different reasons, for instance, Advanced Computer Science, Accounting and Engineering (54% compared with 15% females). In contrast, females were more likely to study Chemistry (23% compared with 15% males) and English (31% compared with 8% of males). However, most students, both female and male, had been using computers for over ten years. The percentage was 67%, compared with other students who stated that they had been using computers for two years or five years. The rest said they had been using computers for eight

years, and those students were aged 35+ years, as illustrated in the graph below.

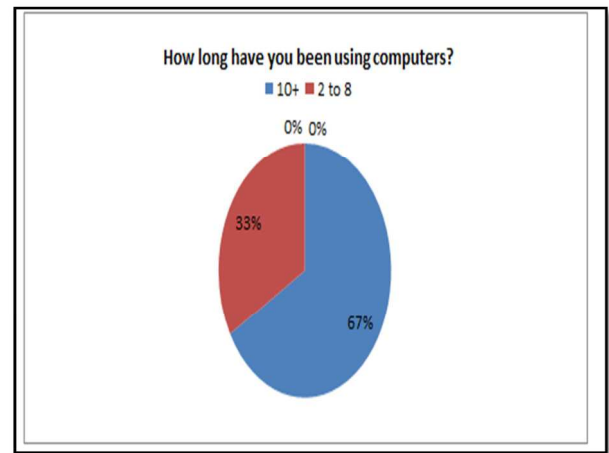


Figure 4: How long have you been using computers?

These results suggest that students aged 35+ were at a disadvantage, as they were not using computers as much as younger students to access e-resources. The findings also suggest they were not sending e-mails or employing methods embracing new knowledge (such as using computers to create photos and graphs) as much as the younger students. This would be related to the kinds of course older students had studied years ago; for example, they were not likely to have studied computer skills. Moreover, 58% of the students spend approximately 15 hours or more per week on the Internet at home or elsewhere. Those studying Engineering and Computer Science were most likely to spend over 15 hours per week on the Internet, as illustrated in the graph below, whilst other students spent between 5 and 10 hours per week.

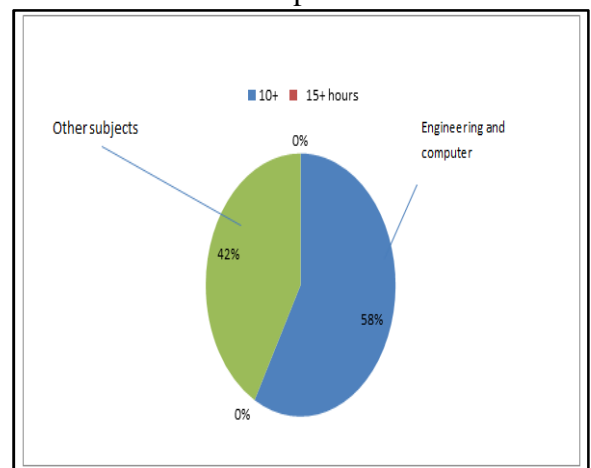


Figure 5: Hours using the Internet per week

In order to discover how students feel about using computers, the students were asked to state which of these statements most closely related to them:

- I. I am not confident in using computers, because I am not good at all at using technology.
- II. I am good at using computers for some essential tasks.
- III. I am very confident in using computers for many tasks.

The majority of students were confident in using computers, as illustrated in the graph below; about half (47%) stated that they were very confident in using computers for many tasks, whereas 38% of students said that they were good at using computers. Males were more likely than females to be confident (37% of males compared with 10% females).

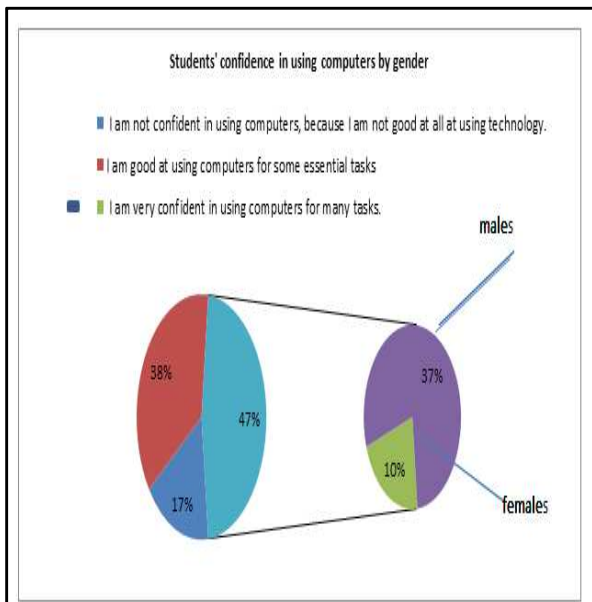


Figure 6: Students' confidence in using computers by gender

Age was a significant element, with older students less confident than younger learners. 10% of students aged 35+ felt confident compared with 41% of 21–35-year-olds, as shown below. Students studying Advanced Computer Science and Engineering were the most confident in using computers, whereas students studying Business, English, Chemistry and Health and Social Care were the least confident in using computers. Full-time students stated more confidence in using computers than part-time students.

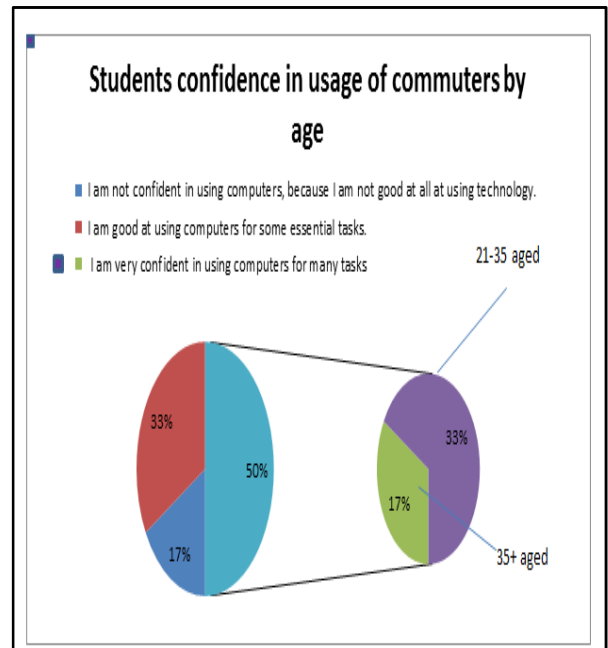


Figure 7: Students' confidence in using computers by gender

The analysis showed that 70% of Libyan students found online learning interesting; they liked the online environment and wished to take another online course. In addition, 60% would recommend the online environment to Libyan students who study in Libya. Only 23% were not interested in the online environment. Interestingly, 90% agreed that if traditional learning were blended with e-learning, it would be more useful.

Based on the findings, the main factors analysed, which were tutor support, learning styles, and time management, do influence student satisfaction; however, gaining knowledge was the factor, which had the most impact in determining student satisfaction with online learning. Moreover, the general opinion of online learning is that flexibility and tutor support were the main reasons for students' satisfaction. The majority of students in this research were comfortable and confident concerning usage of computers, as well as the online environment in general. Most students spent over ten hours per week on the Internet in their home or other places; also, most of them had over ten years' experience of using a computer, and the majority of students recommend blending this environment with traditional learning. In addition, some of them would recommend the online environment to Libyan students who study in Libya. However, a

few students preferred traditional learning to online learning; the main reason for this was lack of skills to learn and lack of time to access the online environment. The findings showed that Libyan students had positive attitudes towards online-learning; it was felt by most respondents that e-learning supports traditional learning methods, these results being based on the respondents' gender, educational level and age. The findings also showed that online learning is an effective teaching method to motivate students to learn and encourage them to continue in further education. Thus, technology plays an important role in improving and developing teaching methods as well as giving students wider opportunities to learn.

6. THE EFFECTIVENESS OF IT STRATEGY:

To increase the effectiveness of IT in Libya, universities should take the following issues into account:

- The need for Libyan companies to translate programs that are used in the design of e-courses into Arabic language; also, the need for the development of Arabic sites on the Internet, so that teachers can design modules in the Arabic language for students at different stages.

- The need to train pre-service education students in the use of online modules and methods, in order to prepare them to make use of ICT skills in general and develop their ability to use and design courses; this should be an integral part of their training and should form one of the requirements for graduation.

- Training courses should be established for teachers at all levels and all disciplines on the use of module-mail and design methods.

- It is important to interest universities in teaching online courses, and to encourage them to create sites for electronic modules rather than using teaching traditional methods. This would contribute to solving the problem of shortage of faculty members, lack of classrooms and overcrowding of classrooms, and would address the steady increase in the number of students applying who are interested in education. [19]

- When designing online course there are a number of things that should be taken into account, which are: the importance of setting goals, tasks and electronic discussions clearly; the use of public and private messages to give feedback on all targets and tasks; meeting with

students on face-to-face visits before the start of study; the integration of chat rooms and discussion threads with modules; emphasis on the need for time commitment and encouragement of students to commit to this; the need to train students to connect to the Internet and gain access to sites several weeks before the start of their course of study, and training in additional techniques used for remote connection such as by audio, image and phone when necessary.

- Before placing any module on the Internet, the following should be considered: the justification for the use of online or e-learning should be determined, the needs of students and teachers should be identified, and the teaching strategies should be reconciled with the environment of distance education.

- When using e-courses for the first time, the following should be considered. The skill level of students in the use of the computer should be determined before starting registration for study on the online module. The requirements of the existing computer use policy should be identified and strengthened. Students' skills and attitudes should be continuously evaluated, and diversification of the educational components should be ensured. Students should be provided with the necessary technical support by the school or the department, particularly in relation to web design. The first lectures for university students should be convened in the traditional manner to enable students to meet face-to-face with their colleagues at least once. Graduate students should be used to help guide bachelor's degree students. Course content should be provided in several ways, making use of a number of channels of communication to ensure flexibility. Contact should be made with students by telephone and initial notes distributed to them. To improve the teaching and learning process through the Internet, goals should be set to determine participation in the program and roles should be identified to enrich the dialogue. Struggling learners should be provided with support and follow-up. Teachers should keep abreast of developments and urge the students to participate in debate by making them aware of the importance of interaction in achieving learning objectives. A range of sources of information should be provided during discussion. [15]

- To raise the spirit of online learning among the group, staff should consider the following. To ease any tension caused by the use of technology among members of the team, e-mails should be sent, motivating team members to overcome the problems they face. Students should be provided with different tools to support them at different stages in the process of solving problems. Staff should help them as they try to reach consensus, and students should be organised into groups based on their ability and the task to be performed. Teachers should also provide useful feedback in a timely manner. Focus on discussion topics can be supported by using topic threads. Groups should be encouraged to develop their ideas by asking questions and following links. To reduce the sense of criticism and attack on others, staff should use their imagination to highlight common themes among students of different opinion.

7. THE NECESSITY OF MAKING THE TRANSITION FROM TRADITIONAL LEARNING TO ONLINE LEARNING:

ICT has made rapid progress and has infiltrated all areas, including the field of education. Teachers and students in elementary, middle and high schools and universities in all developed countries use the Internet, and educational multimedia classrooms and laboratories are involved in the process of teaching and learning. In schools and universities in Libya, however, the educational process is carried out in the classroom, and is based on the teacher as a source of information using the traditional methods of books, pens, blackboards and old teaching aids. The use of computers, the Internet and educational multimedia laboratories has not yet found its way into a lot of our schools and universities. The use of technology in education has now become an inevitable necessity rather than a luxury, because of its positive effects on the teaching and learning process. Therefore, the transition from education by traditional methods to online-learning based technology - either wholly or in part - must be made, and this requires several steps involving time and effort. [11] These steps are discussed below.

- Amendment of education policy is required at the level of schools and universities in order to make technology an essential tool in the educational process at all stages. This can be achieved by the formation of committees at university level or by school district to organise the development process. Such committees should consist of a team of specialists in several areas, such as those experienced in the development of the curriculum and instructional technology. These teams should study the reality of the use of technology in schools or universities, and support the management of these institutions by encouraging them to integrate technology into education and enabling teachers to use it.

- A vision or a comprehensive long-term plan should be established for the integration of technology into education at the level of courses and classes at different stages, and a period of time should be identified for implementation of the merger plan. The integration process should be done in stages, each of which consists of small gradual steps, and a budget should be allocated for the integration of technology into education to cover the costs of buying hardware, software and teacher training expenses, as well as the expense of hiring experts and trainers and the establishment of a technological infrastructure. This includes supplying universities and schools with hardware and accessories, providing multimedia computer labs and Internet service, and the replacement of old hardware - if it exists - with more modern and sophisticated devices.

- It is essential to train students and teachers on the use of computers and the Internet in teaching and learning. This should be done after the school or university has been provided with computers and devices so that the necessary direct extensions are in place.

- A centre for curriculum design should be established and, based on the technology at the university or school, a team of specialists should be employed to prepare an electronic multimedia curriculum in different disciplines, which may or may not be supported by the Internet. The researchers Othman and Kenan suggest that the specialist team which sets up the e-learning programs should consist of: a project manager; a curriculum designer; an author of texts for the

educational program; a designer to deal with photographs; a programmer; an engineer to test the validity of the program to be used; an editor responsible for sustaining the program and judging the compatibility of fonts and spin-offs; a specialist to examine connections and make sure the system works, and that the program as a whole works well without causing crashes during use with other programs; a team member to deal with visual aspects including images and graphics, and another to deal with audio output; specialists in scientific material, and financiers of the project. [8]

- Research in the field of e-learning should be conducted on an ongoing basis to inform teachers and officials on the impact of the use of technology in teaching and learning, and to ensure that students benefit from the integration process. It is also important to follow the latest developments in the field of educational technology and permanent provision of technical support should be available for maintenance of hardware and networks. When teachers use technology in education, they may face some problems, such as printing problems, the Internet connection stopping suddenly or being unable to open e-mail. The authors point out that this requires a technician responsible for managing the network and another who is permanently responsible for maintenance of the network, to repair malfunctions and assist teachers in designing websites and web pages. The technician should oversee training and planning, and answer teachers' questions, as well as organising coordination between the networks of a group of schools, or colleges at a university, or a number of universities. [20]

- The process of integration should ensure that technology is part of daily classroom activities, supports the curriculum and students, and plays a positive role in the process of teaching and learning. It should enable education to become meaningful for students. However, it is important to emphasize that no plan to integrate technology into education will succeed, even if provided with all potential financial, spatial and advanced technological resources, if we do not develop and train teachers to use this technology. Training is therefore at the heart of the process of integrating technology into the educational process.

8. PROPOSALS FOR THE CONTRIBUTION OF COMMUNICATION TECHNOLOGY AND INFORMATION TECHNOLOGY TO ACHIEVING THE GOALS OF EDUCATIONAL CURRICULA IN LIBYA [11]:

- There is a clear need to reconsider the current curriculum in Libya, in order to find a methodology more comprehensive and modern than the current system. This can be achieved only by reconsidering present approaches, processes and output on the one hand, and considering the variables of the modern era on the other. A key part of this process will be to reconsider the objectives of the educational curriculum in Libya, bearing in mind the need to include the dimension of information technology and communications technology. [21]

- In the educational process, there is a need to emphasize the basic concepts of acquiring information, making comparisons between data, providing feedback sessions on the information, considering different information processing methods and the characteristics of good information.

- There is a need for the learner in Libya to acquire basic skills for finding information, classifying it and broadcasting or publishing it from one place to another. It is imperative that modern technology is used in achieving these goals and that the learner is given the right vision of the information revolution. Massive recruitment of students to gain such technological understanding will serve Libyan development plans through their future participation in manufacture, marketing and global competition.

- There is a need for the educational curricula of the Arab world to utilize modern tools and technology. The means offered by modern communications technology, such as the Internet, e-mail, satellite and video, etc. should be used as methods of teaching and learning. Such methods include self-education, individual learning and distance education as well as university education. There is also a need to work on creating an Arab information network to which all Arab countries should contribute as fully as possible, in order to feed Arabic educational political and economic systems all the necessary data and information. This would

create a kind of Arabic technological informatics unity, and could be done under the umbrella of the Arab League. Courses of in-service training should be provided for Libyan teachers on methods of electronic data processing, and methods employed to achieve the objectives of the courses they are teaching.

- Students recruited onto courses at education colleges and colleges of teacher training in Libya should be trained in the practice of technology as part of teaching and learning. Becoming familiar with such scientific approaches will lead to improved use of methods when the student teacher is assigned the task of actual teaching after graduating from such colleges. It is important to reconsider the methods of educational management in all Libyan educational systems, as flexibility in the management of facilities and a sound understanding of the objectives of successful management will contribute directly to the achievement of a qualitative and quantitative improvement in the use of information and communications technology in all processes of the education system. [24]

9. RECOMMENDATIONS FOR EFFECTIVE DESIGN AND IMPLEMENTATION OF IT STRATEGY IN HEIs.

ICT plays a huge role in knowledge transfer, and for Libya to have sufficient competent knowledge workers; the government must ensure an education system able to play a key-supporting role. For example, ICTs must be introduced in schools from an early age if the success of online learning is to be ensured [25]. Over the past few years, many Libyan HEIs have introduced online learning and many learners have been enrolled, especially learners who want to work full-time and study part-time.

ICT should be continually developed. Libyan HEIs should hire an adequate number of support staff to be responsible for administrative duties and take this heavy burden away from academic staff.

Support staff may be utilized to regularly check that the course content has been updated. From the challenges identified in this paper, it is clear there are some factors that still need to be addressed before ICT can be fully effective as an online learning or teaching tool. Blended learning can be used as a transitory phase towards e-learning in Libyan HE Institutions. Instructors should focus on the attitudes and mindsets of learners, since these have an influence and impact on e-learning that can be derived from assessments done by learners. To be successful, IT applications and online learning should have the declared support of senior management and a fixed budget that has been set aside to maintain and develop ICT facilities. Those responsible for course development should be sent on high-level technology courses to be able to develop and maintain the programme to world standards in terms of course development. There should also be good incentives and rewards to motivate teaching staff to invest their time in online learning and IT applications in the teaching process. Training should be offered to instructors and course developers so that they can be more familiar with learning management systems. They should be encouraged to attend internal and external workshops so that they can be updated on changes to software and hardware. Technological learning tools should be maintained and kept up to date at all times. Bandwidth and network systems should be improved and computer applications should be developed. With the support of senior management and a budget available for online learning activities, licences should be bought to gain access to updated software and technologies. More coordination and resource sharing between different HEIs could be of general benefit. Some HEIs have already shown success in the implementation and management of online learning and IT applications; those institutions should be encouraged to share their success with other institutions. Partnerships should be developed between government, HE and the private sector. Government departments and the private sector should be encouraged to sponsor the development of technologies in HE, which will produce a workforce that is competent in such technologies.

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