Comparing the impact of E-learning and ICT in Higher Education institutions in Libya and United Kingdom

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Abstract:
This paper examines the impact of E-learning and the ICT in the Higher Education (HE) in Libya and UK. A comprehensive analysis of the problems linked to the use of e-learning and ICT in Libyan institutions is performed. It is obvious the pronounced information technology (IT) gap between Libya and the developed world due to social, political and economic conditions in an Arab country where the primary delivery educational model is essentially traditional. Then possible ways of implementing successfully e-learning and ICT in Libyan educational institutions by considering positive UK examples are explored.

Keywords:
E-learning; ICT; Self-directed learning; collaborative learning; assessment.

1. Introduction:

E-learning requires more than just technology to be successful. There is the need for academic professionals well trained in ICT, capable of using E-learning systems and developing learning materials that address the needs of learners. Locally based technicians are also required to maintain equipment and E-learning systems and tools.
The report published by Al-badree in 2006 showed that implementation of E-learning systems in Libya is still in its formative years, at the stage of attempting to implement E-learning case studies because the deployment of information and communications technologies is not widespread. The educators have been attending training course on E-learning implementation since 2002. Then the E-learning was integrated into HE examination process in 2005.
Although these initial introductions of the E-learning opportunities in HE institutions seem to be successful, there are still many challenges that might prevent the general adoption of E-learning.
Al-badree (2006) discussed about these pedagogical, technological, and attitudinal challenges. The introduction of E-learning programs into the educational system of a specific country must take into consideration the social and cultural aspects of that society. The social and cultural background of the educators and learners plays a significant role in determining the effectiveness for the success of E-learning education. This importance differs from one society to another according to the values of the society, and its customs and traditions.
The Libyan Department of Education has emphasized that ICT is creating new ways of learning & training and has the potential to enhance the management and improve the level of education in Libya. The global spread of ICT has enabled the people to use technology into 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 (Al-Teer, 2006).

This paper includes the analysis of the factors that act as barriers to starting, continuing, and completing online learning courses. The importance of these factors is determined by the statistical analysis of the answers to a survey questionnaire designed and implemented by Kenan (2009). A number of 63 teachers, students and technical staff from state and private HE organisations were asked to complete this questionnaire. In terms of gender, 19.05% were females and 80.95% were males and their ages were between 19 and 48. The diversity of this sample allows it to be considered a representative sample for all sections of Libyan HE institutions.

Also this paper presents possible ways of implementing successfully e-learning and ICT in Libyan educational institutions by considering positive UK examples.

2. Analysis of the problems linked to the implementation and use of e-learning and ICT in Libyan institutions:

Kenan (2009) has designed a questionnaire to identify the challenges experienced by teachers, students and technical staff in HE institutions in Libya. The questions have been formulated after a preliminary widespread study related to barriers of implementing and using E-learning and ICT in education has been performed. The aim of the questionnaire was to check if the respondents confirm the barriers of using e-learning and ICT in education as they have been described in publications. Also the respondents were asked to express their personal opinions about other challenges they are facing when dealing with e-learning and ICT.

Artemi (2009) classified the challenges linked to the implementation and use of e-learning and ICT in Libyan institutions to E-learning in Africa into three categories: lack of ICT infrastructure, lack of qualified personnel and resistance to change.
Kenan (2009) performed further studies regarding these challenges. She grouped the barriers into four categories based on the conclusions from her study and personal experience as an academic (see Fig 1):

a) Management barriers

b) Technological barriers
c) Cultural barriers
d) Barriers due to other factors such as cost, etc.

a) Management Barriers

According to Al-badree (2006) and Al-teer (2006), there are several barriers raised due to poor management when discussing about the implementation and use of E-learning and ICT in Libya:

- Increased workload for academic staff.
- Development time.
- Delivery time.
- Lack of extrinsic incentives/rewards.
- Lack of strategic planning and vision.
- Lack of support.
- Lack of training in technological developments.
- Lack of support for pedagogical aspects of the developments.

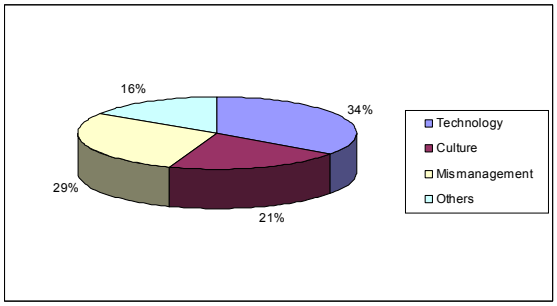

Fig 1: Barriers to E-learning in Libya (Kenan, 2009)

b) Technology barriers

These barriers refer to challenges that are related to the technical aspects of the systems or computers. According to a survey conducted by the Consultation Unit (2007) it was found that 34% of the responses confirm that lack of access to computer software and hardware are the key barriers to E-learning. The authors of this paper propose the inclusion of lack of technical skills, limitations linked to bandwidth and security requirements of IT systems amongst technological barriers.

Lack of access to computers

The major factors bearing on technology are cost and the availability of a telecommunications infrastructure. The majority of Libyan learners do not have access to a personal computer or the www. Libya is still way behind other countries in access to personal computers. In 2004 it was estimated that in Libya personal computer density is low, at 3.4 per 100 persons, and nationally 17% of Libya schools had a computer, but only 12% had one for teaching and learning (MBNQA, 2004).

Elzawi (2010) has performed research on the way that teachers, students and technical people perceive the implementation and use in Libyan HE. The primary means for people to connect is through Internet cafés. The state-owned General Post and Telecommunications Company (GPTC), regulates and operates Libya's telecommunications infrastructure, and owns and operates the country's primary ISP, Libya Telecom and Technology (LTT), which offers Internet services via dialup, DSL, broadband, and satellite. At least seven companies other companies are licensed but are effectively subordinated to LTT, as LTT maintains a monopoly over the country's international Internet gateway. In October 2006, the Libyan government reached an agreement with a non-profit United States group - One Laptop per Child - to develop an inexpensive, educational laptop computer with the goal of supplying a machine to every Libyan schoolchild in the future.

In other countries, e.g. the United States and the United Kingdom, the percentage of computers available at secondary school is 73% and 78% respectively (CIA, 2005). However, there are many less developed countries where computer literacy is very high. Also the ability to access the internet and the number of internet users varies widely from country to country (Zemsky and Massy, 2004).

Lack of technical skills

Technology literacy is one of the foundation blocks of technologically enhanced learning. Advanced equipment such as a computer is of little use, unless information about how to operate, maintain and adapt it to local conditions is available. One of the most important prerequisites of E-learning is familiarity with computers. The lack of such familiarity can hinder E-learning and have a negative effect on the learner's confidence. The lack of technological skills among learners restricts the learning opportunities offered by teachers and acts as a barrier to effective learning. Learners who have never been exposed to using computers may even be afraid to press the keys in fear of damaging the computer (Bennett, et al, 2008). For E-learning to be successful in HE, the issue of lack of computers should be addressed proportionally with the skills to operate them because one cannot function without the other. Technical problems can frustrate learners and can hamper the progress of learners (Alexander, 2006). The lack of computer skills could also affect the ability of the learner to participate in E-learning group activities.

Limitations linked to bandwidth

At the moment there are many clusters of computers and networks that have either worked badly or islands of low bandwidth connections with frequent breakdowns in HE institutions in Libya. Bandwidth is the scarcest ICTs resource in Libyan universities mainly due to prohibitions on academic institutions accessing international circuits and too expensive licensing fees for connecting to advanced circuits or for obtaining authorization. Bandwidth and browser limitations might restrict instructional methodologies. The effects of networks that work badly cause the productivity of users to decrease dramatically if network-based applications are not available or too slow because of denial-of-service attacks. For example, if a web-based E-learning system is slow, users do not only need more time to complete their work, but they also become frustrated, causing a negative effect on productivity.

Security requirements for IT systems

Security has been identified as one of the barriers of E-learning, increasing the complexity of processes and

making everyone's life harder using electronic systems in an area entails security and privacy issues.
In E-learning systems, participation rates and reaction times of learners are recorded. However, one has to take into account that people only use a system if they can trust it and that makes security an enabling technology (Jacky, 2006). However there are two different groups of people are identified who might use the digital content: people with legitimate access and people who access the content without authorization. It is therefore necessary to ensure that access control is enforced on all layers such as the operating system and database. The essential security requirements in this context are that learners must be able to rely on the accuracy of the content and not worry whether the content has been tampered with. Learners also need to be confident in both the E-learning system and the other participants in order to openly contribute to discussions.

c) Cultural barriers

Cultural barriers exist where a certain culture or group is unable to accept or adopt a new methodology in an important area of their lives, such as religious beliefs or social customs or habits. This attitude has been reinforced by events because, with the arrival of new technologies, jobs that could previously be done with a minimum of education fast disappeared. A key concept of E-learning is the flexibility of timing for students but certain religions impose a strict daily timetable, and it is also widely known that many universities have schedules are fixed and not at all flexible. When considering social factors or cultural challenges that could act as barriers to E-learning, one has to find the reasons why people or individuals might prefer not to learn in an electronic environment (Kenan, 2009). Some of the reasons such as the fearing of demonstrating a lack of skill or competence, fear of technology, fear of isolation from other students, lack of awareness of the need to develop or the opportunities available, blaming others for inadequate performance rather than taking responsibility for one's own actions, lack of personal confidence, and a general belief that people cannot change. So, fear poses a serious barrier to E-learning, because it is only through exposure and experience that one can master or be comfortable with E-learning (Twatti, 2006).

d) Cost barriers

A major barrier to introducing e-learning into Libyan HE institutions is the lack of resources. It is sometimes said that Libyan institutions are spending large amounts of money on e-learning, but these costs are not even part of the institutional IT budget, and that this huge expenditures on IT creates enormous problems for institutions; the expenditures exhausts the income, leaves no money for student bursaries and even demoralizes the staff (Kuhlen, 2006). Such a situation can become a nightmare for the staff and learners involved, and that is the last thing wanted by anybody interested in extending E-learning. With all the hype about E-learning in different organizations, how does one measure the results and the return on investment on E-learning deliveries? Checking the costs and the benefits of the e-learning and ICT systems can do that.

3. Analysis of answers – benefits of using e-learning and ICT in Libyan institutions:

Kenan (2009) produced a diagram with the expected benefits of using e-learning and ICT in Libyan HE institutions by the users (see Fig 2). The diagram was produced on the basis of statistical analysis of the answers to the survey questionnaire when the respondents were restricted to only one response, though there are likely to be many benefits from using E-learning.

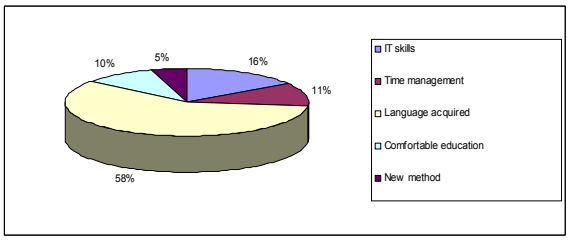

Fig 2: Respondents perceived benefits of using e-learning and ICT (Kenan, 2009)

The questionnaire contained another question related to the most important factor, which should ensure a successful implementation of E-learning and ICT systems in Libyan HE institutions. The respondents emphasized that having a robust and effective ICT infrastructure is an essential factor (see Tab 1).

Requirement	Frequency	Percent
Libyan ICT infrastructure	38	60.3%
Creation of inter university Broad band network	15	23.8%
Internet access	10	15.9%

Tab 1: Respondents' suggested requirements for successful E-learning implementation (Kenan, 2009).

4. Analysis of answers - implementation of E-learning in Libya's HE

The survey questionnaire contained questions referring to the following aspects related to the implementation of E-learning:

- **Level of satisfaction with the existing stage of implementation of e-learning in Libyan HEI's (Q1- question 1)**

More than half (55 %) were satisfied with the level of E-learning implementation in Libya, though about a third were neutral to the idea and some were not so happy.

- **The introduction/extension of e-learning will benefit the educational system in Libya (Q2- question 2)**

Around 31.7% of respondents were in favour of this idea while 40 % were neutral and the rest disagreed with the possible benefits. It is a contradiction with the level of satisfaction declared in the answers for question 1 but maybe it is necessary to advertise better the benefits of

using ICT and e-learning to teachers, students and technical staff.

- **The necessity of using an E-learning system (Questions 3, 4 and 5)**

The answers to Question 3 showed that 31.7% of respondents were in favour of using e-learning rather than traditional learning while the rest opposed to this suggestion. This is mainly due to the fact that the primary delivery educational model is essentially traditional.

Question 4 asked the respondents if they consider to be necessary that all educational organisations in Libyan HE to implement e-learning. Around 39 % of respondents disagreed with this idea and 28 % had no opinion. Possibly after some successes in implementing e-learning in some universities, opinions will change. However, there is a real need in some fields for science and engineering laboratories, which cannot be replaced by online learning.

Question 5 asked the respondents if they agree that E-learning is necessary for academic courses and research. A great number (47.6%) disagreed, particularly the training and technical staff. Once again this is mainly due to the fact that the primary delivery educational model is essentially traditional.

- **E-learning can be considered an important solution to educational problems (Questions 6 and 7)**

Forty –three (68 %) respondents were in favour of using e-learning to increase student numbers, particularly in the rural areas where are practical difficulties related to physical attendance to classes. Also this could help to reduce the level of reluctance of using e-learning and ICT systems in education.

Question 7 asked if the respondents believe that e-learning would encourage those with disabilities and women (mothers, housewives). Forty-two percent of the respondents agreed that e-learning would be beneficial.

- **E-learning will help create a more inclusive society (Question 8)**

Only 23 % of respondents agreed with this suggestion while 33 % were neutral. Maybe after extending the use of e-learning and ICT systems in Libyan education the group of people who are neutral or disagree will be reduced.

The percentages for the answers to every question are included in Table 2.

Qn. / Answers	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Strongly agree	12 (19.1%)	0	0	5 (7.9%)	3 (4.8%)	25 (39.6%)	17 (27.0%)	2 (3.3%)
Agree	23 (36.5%)	20 (31.7%)	20 (31.7%)	15 (23.8%)	10 (15.9%)	18 (28.6%)	25 (39.7%)	13 (20.6%)
Neutral	23 (36.5%)	25 (39.7%)	23 (36.5%)	18 (28.6%)	20 (31.7%)	10 (15.9%)	10 (15.9%)	21 (33.3%)
Disagree	5 (7.9%)	18 (28.6%)	10 (15.9%)	25 (39.7%)	30 (47.6%)	10 (15.9%)	11 (17.4%)	20 (31.7%)
Strongly disagree	0	0	10 (15.9%)	0	0	0	0	7 (11.1%)

Tab 2: Responses to the 8 questions concerning implementation of E-learning in Libya (Kenan, 2009)

Porter and Yegin (2006) produced an official report about the Libyan Education. They emphasized that Libya needs new economic strategies to plan and establish constant bases for the new e-technologies as: e-government, e-education, e-business and e-learning.
More coordination and resource sharing between different HEIs could be of general benefit. There are some HEIs that have shown success in the implementation and management of E-learning; 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 development of technologies in HE that will produce a workforce that is competent in modern technologies.

5. Teaching with technology in UK universities

Jensen and Folley (2011) published the results of a study about the teaching with technology in HE, which explores how lecturers use technology in teaching at the University of Huddersfield. We would consider the results of this survey as a sample on E-learning in UK's HE.
The survey asked about thoughts and opinions of 86 respondents (56% women, 44% men; 83% senior lecturers, 7% lecturers, 10 % part-time staff). Here are the main conclusions of this report.

Use of ICT - expectations and practice
Fig 3 shows the average of answers to specific questions. Around 95 % of respondents use ICTs to prepare their teaching materials because 70 % of instructors believe that the students expect them to use technology in their teaching activities. Also 67 % of staff considers that their colleagues expect them to use technology in their teaching.

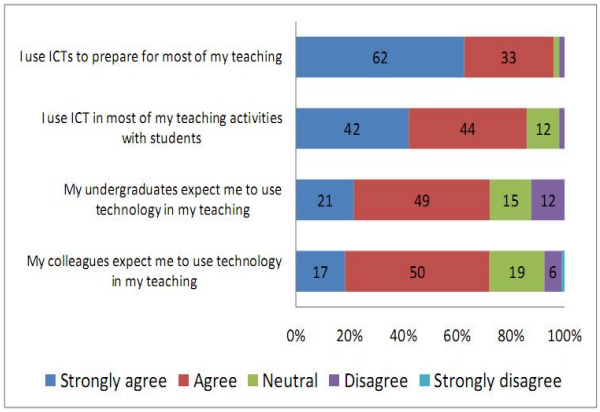

Fig 3: Use of ICT – expectations and practice (Jensen and Folley, 2011)

The survey indicated that 65 % of staff would like to make more use of ICT in their teaching and 80% responded that they were confident about using ICTs in their subjects. There is also a high level of agreement (95%) that if ICT is appropriately used it can enhance teaching and learning (see Figure 4).

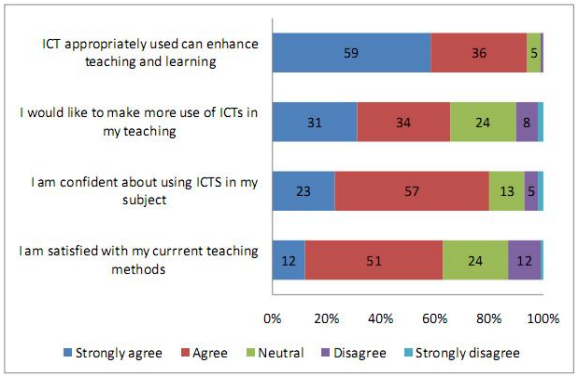

Fig 4: Teaching and the use of ICT (%) (Jensen and Folley, 2011)

The answers to other questions included in the survey showed the need for technology usage to be governed by learning needs, the importance of feeling confident about using technology (for both staff and students) and also a concern that technology does not become a replacement for personal interaction.

Barriers to ICT use

According to this report these are the barriers to ICT use:

1. Lack of time – 81 %
2. Lack of training – 59 %
3. Access to technical support – 49 %
4. Availability of resources – 78 %

Interestingly, only 11% indicated that lack of resources was an issue (though this depends on how respondents define resources). Almost (55%) did not consider access to technical support an issue.

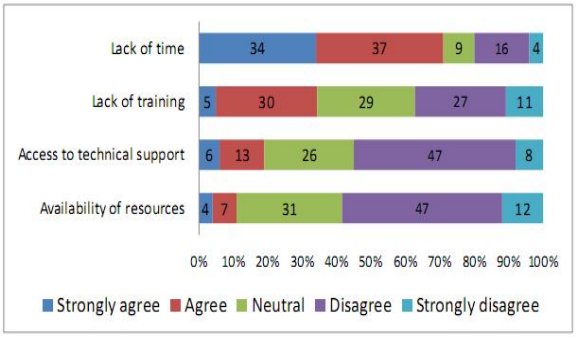

Fig 5: Barriers to ICT use (%)(Jensen and Folley, 2011)

Factors influencing the usage of ICT in teaching

The main barrier in using technology in teaching is the lack of teachers' time to develop on-line materials even though they have recognized that the students' learning will be enhanced. The teachers' level of confidence plays an important part in choosing the use of technology as well as students' expectations (see Figure 6). The same conclusions were presented by Pislaru (2010) after consultations with academic and technical staff.

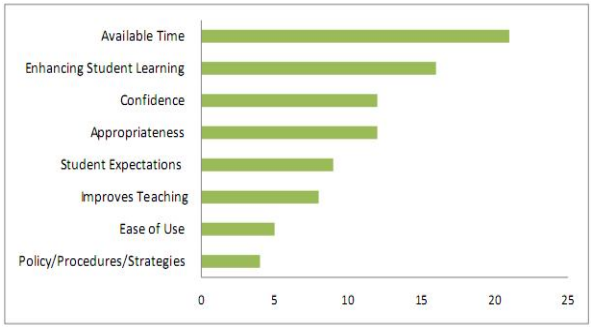

Fig 6: Factors usage technology in teaching (counts) (Jensen and Folley, 2011)

The impact of technologies on teaching:

The survey went on which of the modern technologies have the greatest impact on teaching. Around 85 % of respondents said that slideshow presentations (Power Point) followed by virtual learning environments (such as Blackboard) have a positive impact on their teaching.

However, there are a significant minority (between 13% and 23%) that does not agree that podcasts, e-portfolios, blogging, wikis and social bookmarking have a positive impact on their teaching (see Figure 7).

The respondents who **"strongly disagree"** that PowerPoint, podcasts, e-assessment, blog, wiki and social bookmarking have a positive impact are respondents who indicate they have never used that technology. With the technologies e-portfolio and virtual learning environments this was also true with the exception of a couple of respondent who indicated they had used these technologies some of the time.

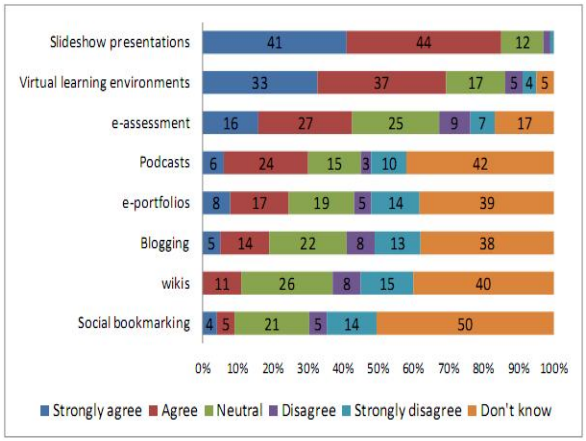

Fig 7: Do these technologies have impact on teaching? (Jensen and Folley, 2011)

6. Conclusions:

E-learning can prove creative in meeting the challenges of higher education. But a very special care should be taken to analyze opportunities, enablers and barriers of E-Learning before their implementation.

It was found that the challenges or the barriers to E-learning in Libya could be classified into three different classes.

Technologically, Libya faced more barriers to the development and growth of E-learning than does the UK.

However, both the UK and Libya face a common hurdle: they lack the provision of strong, fast and widely available internet connection technologies.
Culturally Libyan respondents exhibited resistance to change; however, Libya faces the added disadvantages of lack of experience of use of the net amongst many of its students. Finally, there are several common aspects between the two countries (Libya and UK) regarding the impact of using E-learning and ICT in the HEIs. But there are clear different influences on both the UK and Libya about how people interact with the e-learning and ICT existing in the HEIs.

Also it was evident from this paper that the e-learning systems cannot be successful without using effective ICTs. Therefore, the Libyan ICT must consider the UK attempts with use the ICT in teaching and how they impact on the e-learning in the education. This paper lays the groundwork for an exploration of the relationships of the nodes and their levels or values as regards a rich body of knowledge specific to internet access. It also suggests factors that would assist in the increased use of the internet by Libyan academics.

The integration of e-learning in the educational systems is likely to become faster thanks to recent decisions and commitment of the Libyan government. Access to ICT facilities is likely to be improved in the very near future in all Libyan institutions thanks to major infrastructure projects that are currently in progress. However, there is a need for provision of suitable training at different levels, the development of expertise in e-learning use, and research to gather data and inform future developments; these are important factors that require plentiful attention and great effort from the Libyan government to ensure the development of adequate awareness, attitude, and motivation towards e-learning as well as suitable responses

References:

Al-badree, A.(2006). "Problems of Libyan higher education". In: Alaour, M., ed. Symposium of HE and Development in the Jamahiriya. Tripoli, Libya. December 31, 2007.

Al-teer, M. (2006). "Higher education and development in Libya: a model of multi-twisted line". In: Alaour, M., ed. Symposium of HE and Development in the Jamahiriya Tripoli, Libya. December 31, 2007.

Alexander, B. (2006). " A new wave of innovation for teaching and learning". *EDUCAUSE Review*, 41(2). Retrieved November 16, 2009 from: http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume41/Web20ANewWaveofInnovationforTe/158042

Artemi, M., Ajit, K.(2009). "A SWOT Analysis of E-Learning Model for the Libyan Educational Institutions", The 3rd National Conference of Basic Science 25-27/4/2009 Aljabal Algharbi University Gharian – Libya

Bennett, S., Maton, K. and Kervin, L. (2008). "The 'digital natives' debate: A critical review of the evidence" in British Journal of Educational Technology **39** (5): 775–786.

Consultation Unit, (2007). "The future of education". Published on 9 August 2007 by authority of the House of Commons London: The Stationery Office Limited

Elzawi, A. and Underwood, J. (2010). "How high Education perceive Internet technology usage and prospective in Libya". the international Arab conference on Information Technology (ACIT-2010), University of Garyounis, Benghazi-Libya. December 14-16 , 2010)

Jacky, P. (2006). "ICT teaching experience sharing in higher education: an education development approach" Informatics in Education - an international journal, Vol. 5, No. 2, 265-284 (May 2006) institute of mathematics and informatics, Vilnius.

Jesen, K. and Folley, S. (2011) Teaching and Learning Institute Working Paper No.1, University of Huddersfield, March 2011.

Kenan, T. (2009) The Barriers of E-learning in higher education in Libya. MSc Thesis. In: UK, University of Salford, (March, 2009).

Kuhlen, R. (2006). "Collaborative e-learning- an opportunity to identify and to overcome gender barriers". UNESCO Chair in Communication

MBNQA (Malcom Baldrige Nationality Quality Award). (2004). "Education criteria for performance excellence".Www.quality.nist-gov/pdf-files/2004-education.

Pislaru, C (2010) 'Development of Lifelong Learning Skills by Embedding E-learning into the Curriculum'. In: HUDCETT conference, 11th May 2010, University of Huddersfield, UK.

Porter, M., and Yegin, D. (2006). "National economic strategy: an assessment of the competitiveness of the Libyan Arab Jamahiriya". The general planning council of Libya. Cera, UK.

Twatti, J.M., (2006) "The impact of organizational culture innovation on the adoption of is/it: the case of Libya". Journal of Enterprise Information Management. Vol. 19, no.2.

Zamsky, R., and Massy, W. (2004). "Thwarted innovation: what happened to e-learning and why". The Learning Alliance at the University of Pennsylvania. Pa, USA.