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A Study on the Impact of ICT on Collaborative Learning Processes in Libyan Higher Education

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Abstract. This paper presents the conclusions of a study on the impact of ICT on collaborative learning processes in Libyan Higher Education (LHE). The quantitative analysis of the answers to a questionnaire (completed by Libyan full-time lecturers at the universities of Tripoli, Garyounis, Gharian and Ezawia) shows the necessity to design and develop more classroom activities and interactive online applications, enabling the development of team-building skills required by employers. The influence of limited Internet bandwidths in Libya on collaborative learning processes in HE is then presented. It is obvious that HE institutions need to develop proactive strategies that envisage and anticipate learners' future learning needs and requirements in this transition period of moving towards an increasingly digitalized, networked and knowledge-based society. The paper also contains the analysis of a SWOT model considering the factors that must be considered in relation to collaborative learning within the university teaching process, such as intelligent multimedia, Internet technologies, and knowledge management. The employment of modern technology will enable the development of innovative and inspiring collaborative learning environments where lecturers are expert designers of intellectual experiences for students, who become active participants to the learning processes.

Keywords: ICT; Internet Bandwidth Constraints; Collaborative Learning; E-learning; SWOT analysis.

Introduction:

Information and Communication Technology (ICT) is now considered an integral part of people's whole lifestyle. It has been adopted in the field of Higher Education Institutes (HEIs). Initially, a number of key challenges have faced educational organisers; decision makers and management teams as a result of adopting ICT and computer networks in the educational environment. These challenges are related to the ability to identify a suitable long-term strategic visualisation. The identification of a strategic visualisation can be effectively delivered by embracing better strategic management techniques,

which can assist the HEIs in balancing the stresses of change, continuousness, stability and resources. Libyan higher education institutions (LHEIs) need to make more efforts to increase the use of ICT in teaching and learning processes.

With an increase in the number of students enrolling in colleges, compared with a decline in the number of qualified teachers, and their ICT experiences and the increasing demand for accountability, and anxieties about the social and economic position of higher education, LHEIs have forced employment for “successful, self-sustaining client oriented providers of education in a rapidly changing borderless education world” (Till, 2003). The rapid progression of ICT has also reacted to different approaches to knowledge creation, management, and delivery methods. LHEIs have remained behind other areas in embracing improvement and ICT. On the other hand, they do not have clear ideas about ICT’s role in improving the learning process to involve all stakeholders and organizational structures. Rhema& Miliszewska (2012).

Limited connections have been found between the provision of ICT and the higher education improvement process in Libya. ICT tools were separate from the improvement process, except for departments such as electrical engineering and computer science that facilitate additional technological tools. Interestingly, in the mid-1990s LHEIs started implementing the improvement process; this proceeded without changes in academic work practices. Recently, it has become apparent that higher education improvement cannot take place without paying attention to ICT, specifically those applications that affect education management and administration, and support of teaching and learning. (Kenan et al., 2013). The future of LHEIs and universities in Libya should not only be imagined or perceived; it should be executed and implemented. Therefore, there is a need to adopt a suitable strategic architecture or a planning design to perceive the future of these HEIs, as well as to increase competitive advantage in the changed educational situation. This trend is dependent on the presence of larger leadership, complex communications, and teamwork. Thus, those HEIs which acquire and use new technical knowledge can increase and improve competitiveness and formulate an effective strategy. Critically, the LHEIs seek to follow the international standard and compete with other countries’ HEIs. This goal is an important mission by the LHEIs in moving toward a knowledge society in which ICT is considered a prerequisite.

E-learning implementation in LHEIs:

LHEIs are still facing a critical absence of skilled specialists who recognize basic and progressive programming for planning, designing, and implementing branched information systems and managing huge scale e-learning projects. The

high turnover rate of skilled technical staff is another problem in the LHEIs, which have seen continuous deterioration in their ability to recompense salaries, which were previously competitive with the private companies (Artemi & Aji, 2009). The LHEIs have found it difficult to motivate the technicians to assist them in expanding and building wide networks, and developing and managing administrative systems, research, the curriculums of the courses and the applications. A number of LHEIs have worked hard to solve this problem by launching wide-ranging and continuing professional development programmes for their staff and utilizing their computer science and electrical, network, and computer engineering departments.

There are also a number of challenges affecting Libyan students in the learning process, which can be improved through using ICT and intelligent multimedia, which includes text, sound, animations, colourful and moving images. This can increase the educational benefits for students, as well as developing their skills (Rhema& Miliszewska, 2013). The teaching load in Libyan universities is notably heavy; on average, the number of teaching hours for academic staff is 24 hours/week and sometimes more. Libyan universities have not yet established a scientific research tradition (Artemi & Ajit, 2009); (Lishan, 2003). Hence, even Professors deem that it is difficult to find time for research activity and educational development. (Porter & Yegin, 2006). Interestingly, a number of academic staff do undertake extra activities such as writing and publishing, for example: textbooks, to increase their income (Kenan et al., 2011); Elzawi et Al., (2012) and Rhema& Miliszewska (2010).

Kenan wrote in 2011, the LHEIs have taken collaborative learning into consideration as a valid mode for educational processes. As a result, the Libyan Business Executive Survey/ Global Competitiveness Report (LBES/GCR) has ranked Libya to be 97th out of 111 countries in university/industry research collaboration. The majority of the LHEIs have not appointed a staff member with formal qualifications in either distance learning or E-learning (Twatti, 2006).

In fact, the Ministry of Libyan Higher Education, which is the legislative body responsible for endorsing degrees from foreign universities, does not endorse a degree obtained through either distance learning or E-learning. Without the approval of the Ministry, students cannot gain any advantage in the workplace from their degrees (Elzawi & Wade; 2012). This is of great significance and could be developed.

Investigation of the technological contexts for e-learning implementation:

Teaching and learning are the cornerstones of most LHEIs. However, maintaining the quality of such processes is a continuous challenge Kenan et al.,

(2011). The main teaching methods used by LHEIs are traditional for three main reasons:

- The annual increase in the number of students enrolled.
- Restrictions on financial resources and staff training.
- The administration system.

In spite of the known weaknesses of such an approach, traditional teaching has provided teachers with the means to deliver the required course materials to an ever-increasing number of students and provide those students with a clear-cut minimum of materials such that they can easily memorise them (Sarayrah, 2003). Therefore, generally HE students do not contribute to the learning process in the classrooms. They are only listening and taking notes. Furthermore, the use of new technology in LHEIs (such as computers and multimedia in general) is way behind international best practice. But to involve students effectively in the learning processes, the HEI should adopt an "active learning" approach – whereby the students use resources outside classrooms, in libraries, the Internet, interviews or focus groups, to obtain information approach (Bhatti, et al., (2005). There are relationships between students, academics, administrators and technical staff, which are confirmed through observations, experiences; many survey results and other studies. These have represented many attempts to analyse IT implementation by using the SWOT model in different LHEIs since 2003 (Othman et al., 2013).

Also, Kenan et al., in 2013 have presented the Strengths, Weaknesses, Opportunities and Threats (SWOT) as a model for a new IT strategy; other factors that must also be considered in relation to collaborative learning within the university teaching process. The SWOT analysis model shows that the strategy is useful for determining methods to achieve successful implementation of IT in the LHEIs by including intelligent multimedia and Internet technologies. (Artemi & Ajit; 2009).

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 Kenan et al., 2013. Collaborative learning and IT strategy can offer a framework for assessing the impact of all implementation stages. The strategy should be appropriately flexible to accommodate changes and developments in online learning products, services and technology. The implementation stages in an official setting also need to include strategic planning. (Keats, 2002).

The methodology:

This research was conducted using both a quantitative and a qualitative approaches. The quantitative approach in order to collect statistical data for a large group of participants that reflects their perspectives (Creswell, 2009); while the qualitative approach in order to result about the duration of Internet usage;

frequency of Internet usage and the place of Internet usage thought three interviews and answering many questions. This paper will present the relevant responses from participants of Department of Engineering School of Tripoli University. A questionnaire was used to collect the quantitative data. It is considered to be the most common instrument used in academic research (Bryman, 1989).

The questionnaire was designed using an online package (Smart survey) to avoid missing answers. This confirms that the Internet technologies work is parallel with all education applications. Thus, the classroom activities and interactive online applications enable the development of the team-building skills required by employers.

The questions of the interview:

The responses from participants indicated that Internet usage was not common among academics at Department of Engineering School of Tripoli University (ES/TU). In other words, most of the participants mentioned that they did not use the Internet as a communicational means to exchange information or opinions with their students. Only two participants had previous experience in using this technology, and that was only a short-term. For instance, one mentioned that he had started using the Internet only one year previously, with the purpose of communicating with his students when they were away from the university. Specifically, he said that: *"I started using the Internet for contacting students only two year back. The aim was mainly to contact students who studied away from the university campus"* (ES/TU1).

Some academics realized the importance of online communications with students and intended to use this means of contact in the future. *"I look forward to being in touch with my undergraduate students in the virtual environment. However, I haven't implemented it yet"* (ES/TU2). On the other hand, some academics did not seem to be very interested in using these tools for interacting online with their students. Nevertheless, it turned out that they used the Internet as a communicational means only, in order to contact colleagues, educational institutions and other organizations for official communication. *"Actually, I am not in contact with my students through the Internet. I use the Internet only to contact my friends, colleagues"* (ES/TU3).

Finally, it seems that some participants did not want to start interacting online with their students, as one of them stated: *"I do not use the Internet to communicate with my students"* (ES/TU1).

However, Academics at DEL generally used the Internet in different places, such as their own offices, the faculty computer laboratories and their homes. For instance, one of the academics said: *"Sometimes, I use the Internet in the computer lab at the Faculty of Engineering. However, some other times, I also use it at my home"* (ES/TU1).

About the frequency of Internet usage, the participants showed that academic staff members at ES/TU used the Internet on a daily basis. And they did not specify the frequency or length of Internet use for communicating with their students. Their answers in this regard were general and vague. This indicated the nature of their use fluctuated that based on their attitudes and needs. *“Usually I spend around one- two hours daily on the Internet but in terms of searching time I spend much longer” (ES/TU3).*

Sample and questionnaire:

This article aims to present the results of a questionnaire distributed to a sample of 41 Libyan lecturers (17 Libyan lecturers work as full-time in different LHEIs, plus 24 Libyan lecturers study in the UK to get their higher degree) who were also full-time lecturers at the universities of Tripoli, Garyounis, Gharian and Ezawia.

The results (Participants' Profile):

These were taken into consideration as important aspects of data collection that identify the characteristics of participants. Table 1 outlines the profiles of the participants under investigation

Statistic Data	Categories	UK (%)	Libya (%)
Age	- 30 year	8.33%	5.88%
	31 -35	16.67%	0.00%
	36-45	29.17%	64.71%
	46- 55	41.67%	23.53%
	+ 55 year	4.17%	5.88%
Gender	Male	37.50%	52.94%
	Female	62.50%	47.06%
Qualification	Higher National	0.00%	5.88%
	Baccalaureate	10.53%	5.88%
	Diploma	0.00%	5.88%
	Master	42.11%	64.71%
	M.Phil.	21.05%	5.88%
	PhD	26.32%	11.76%
Teaching experience	- 2 years	20.83%	17.65%
	2-5	45.83%	17.65%
	6-8	4.17%	35.29%
	9-11	4.17%	11.76%
	12-15	4.17%	5.88%
	16-20	8.33%	11.76%
	+ 20 years	12.50%	0.00%
Faculties	Science	12.50%	47.06%
	Medicine	8.33%	5.88%
	Arts	0.00%	0.00%
	Engineering	25.00%	76.47%
	Education	20.83%	11.76%
	Languages	12.50%	5.88%
	Business	29.17%	11.76%
	Info. Tech.	25.00%	17.65%
	Other	8.33%	5.88%

Table 1: Participants' Profile

Table 1 summarises participants' profiles, comparing between Libyan lecturers who studied in the UK, and others who worked full-time in Libyan universities. The majority of the participants who studied in the UK (more than 40%) belonged to a group aged (46-55), while the majority of those who worked in Libya (approximately 65%) belonged to a group aged (36-45). Furthermore, the majority of the participants based in the UK were female (more than 60%), whereas there was no significant difference in gender between the participants involved in Libyan universities. Furthermore, approximately (47%) of the participants in the UK had M.Phil. and PhDs, while less than (20%) had the same qualification in Libya? In addition, more than (45%) of the participants based in the UK had (2-5) years of experience, while approximately (35%) of the participants in Libya had 6-11 years' experience. Finally, for the faculties, the majority of the participants in the UK studied in the Business faculty, while the majority of those in Libya worked in the Engineering faculty.

Teaching time:

The participants were asked to determine how many hours they spent weekly in terms of teaching. See Figure 1.

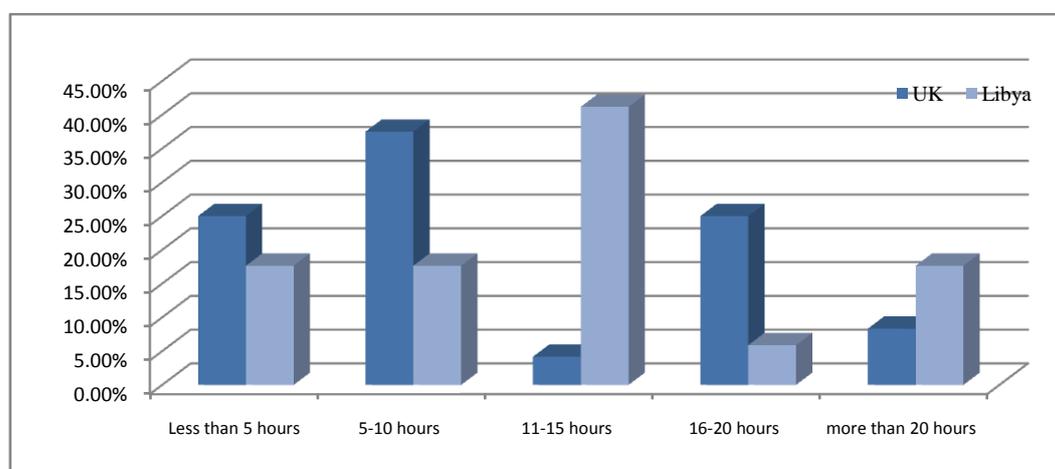


Figure1. Hours of teaching time per week

Figure 1 shows that Libyan tutors who worked in Libya spent more time teaching than the Libyan tutors in the UK; approximately 40% of the participants working in Libya spent between (11-15) hours per week in teaching, while the percentage was less than 5% of the participants studied in the UK. In contrast, more than (20%) of the participants studied in the UK spent between (16-20) hours, while it was approximately (6%) for those who worked in Libya. That reflects that the lecturers spent a long time teaching. The overloading of teaching might affect the quality of teaching or might affect time available for research or developing skills. This result confirms the findings of (Artemi & Ajit; 2009) and (Porter & Yegin; 2006), which addressed how teaching overloading and long

teaching hours in Libyan universities influences tutors in terms of decreasing research activities and educational development.

Time spent on the Internet:

The participants were asked to determine the amount of time spent using the Internet in general per day. See Figure 2.

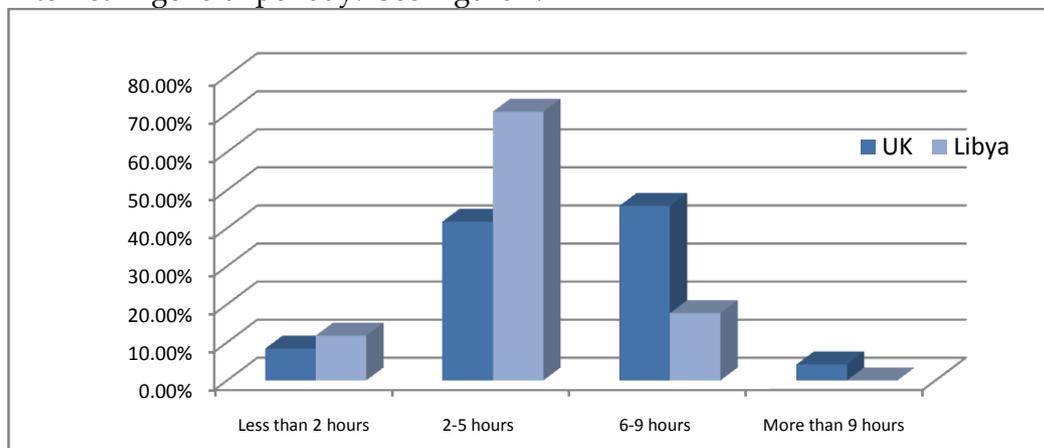


Figure 2. Time spent using Internet per day

According to Figure 2, the time spent by the participants who worked in the UK was more than the time spent by those participants who worked in Libyan universities. The majority of the participants spent (2-5) hours daily using the Internet. More than 70% of the participants working in Libya spent (2-5) hours per day using the Internet, while more than 45% of the participants based in the UK spent (6-9) hours per day. These results assert the findings of many studies as Till in 2003; Bhatti, et al., (2005) and Elzawi & Wade (2012). The style of education system in Libya, based on traditional ways of teaching, might affect the participants' usage of the Internet. That reveals that the quality and the accessibility of Internet technology in the UK might be better than the Internet in Libya, or that there might be a lack of skills.

The value of using Internet technologies and intelligent multimedia:

The participants were asked if they believed that using Internet technologies and intelligent multimedia could add value to their lectures. See Figure 3.

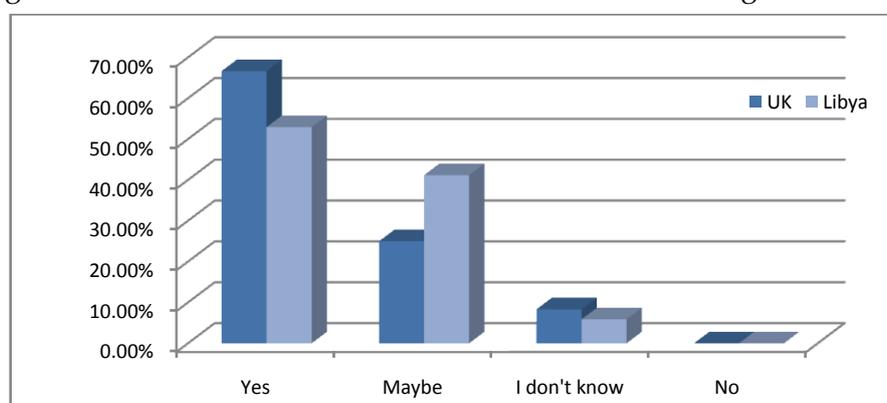


Figure 3. Rating the value of using Internet technologies

As seen in Figure 3, the participants working in the UK were aware of the value of the internet and intelligent multimedia more than those who worked in Libyan universities; however, more than 50% of the participants in the UK and Libya found that it was useful to adopt IT to enhance their lectures and support the curricula; nobody indicated that it was not useful. That might demonstrate their awareness in the educational process. This demonstrates that the lecturers were interested in using IT applications to support their lectures, which agreed with [Libyan Business Executive Survey] and Kenan et al., 2013, which showed that LHEIs were aware of the importance of adopting ICT in the academic field. That awareness might be reflected in the participants' perspectives.

Time spent using technology in teaching:

The participants were asked to determine the amount of time spent weekly using technology for teaching. See Figure 4.

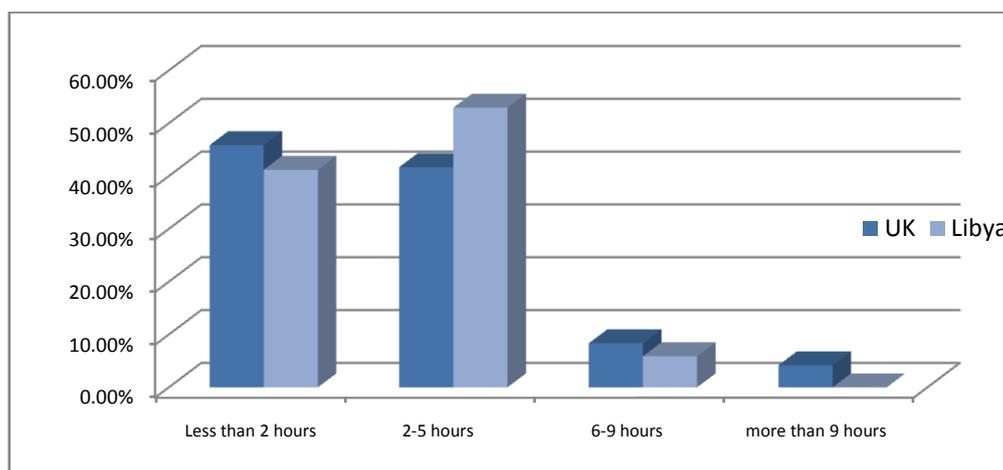


Figure 4. Time spent using technology in teaching per week

According to Figure 4, of the majority of the participants worked in Libya, approximately 52% spent (2-5) hours per week, while approximately 5% of them spent (6-9) hours weekly. In contrast, more than 40% of the participants based in the UK spent (2-5) hours weekly using the technology in teaching, whilst approximately 9% used it for (6-9) hours per week. Thus, it appeared that the time spent using technology for teaching per week was inadequate, comparing this result with the time spent in teaching per week. This result confirms the need to implement an active learning approach Bhatti, et al., (2005).

Benefits of e-learning implementation:

It was crucial to identify the benefits that would be obtained from implementing e learning in LHE. See Figure 5.

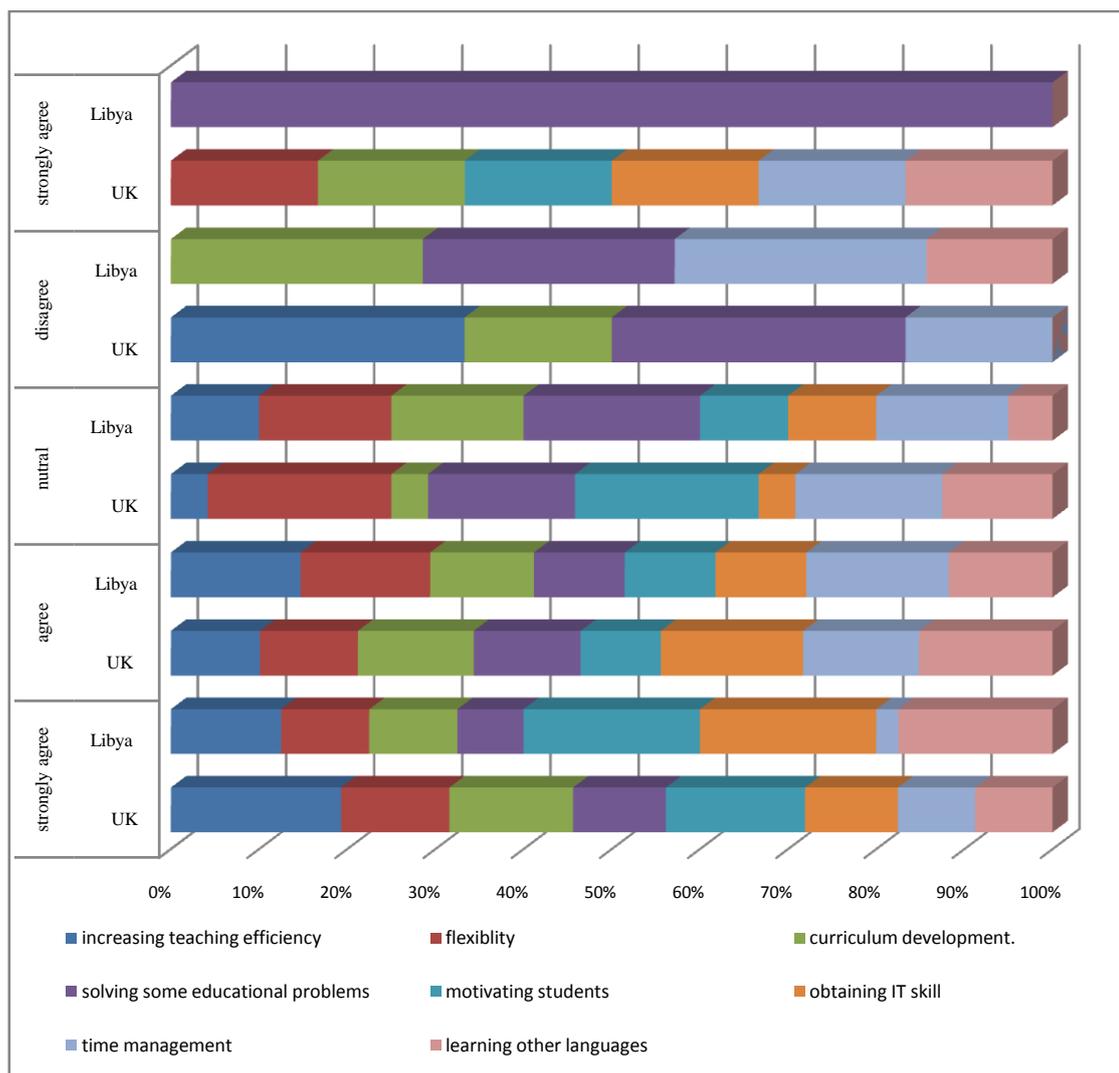


Figure 5. Benefits of e-learning implementation

As seen in Figure 5, the majority of participants agreed or strongly agreed that implementing e learning in LHEIs would increase achievement and provide a set of benefits. On the other hand, more than 5% of the participants strongly disagreed that implementing e-learning in LHEIs would assist in solving some educational problems, while approximately 4% of the participants based in the UK strongly disagreed that e-learning would help in developing the curriculum, motivating students, obtaining skills, managing time and learning other languages. This reveals that the participants might be aware of the importance of adopting e-learning systems. This result confirms the results of Kenan et al., 2013, Kenan et al., (2011). Thus, implementing e learning in LHEIs is useful in terms of enhancing the teaching and learning process.

Important elements of e-learning implementation:

The participants were asked to select important elements that affect the successful implementation of e learning. See Figure 6.

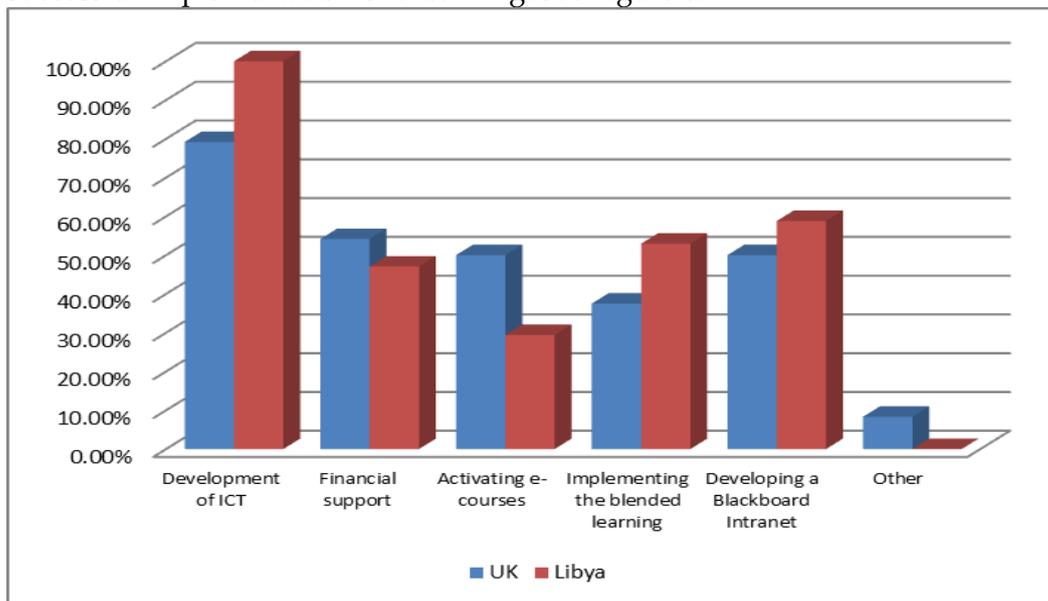


Figure 6. Important elements for successful e-learning implementation

Figure 6 shows that the most important element of e-learning implementation was the development of ICT; this was agreed by more than 95% of the participants working in Libya, and more than 75% of those who studied in the UK. In contrast, activating e-courses was the least important element, with less than 50% of both participants acknowledging it; this disagrees with the results of Kenan et al., 2013, where implementing e learning required the development of ICT tools for better achievement.

Barriers to e-learning implementation:

However, the participants were aware of the importance of applying e learning in LHEIs; the participants faced a number of barriers. See Figure 7.

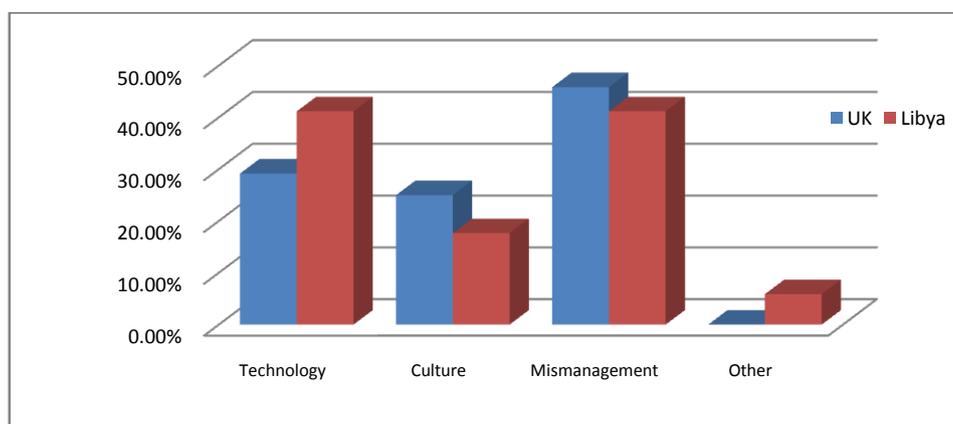


Figure 7. Barriers to e learning implementation

According to Figure 7, mismanagement barriers were the most significant barriers confronting both sets of participants, with a response of approximately 40% by both of them. These barriers might be related to a lack of legislation, a lack of education strategy, and policy rules. On the other hand, cultural issues were less important barriers for the participants who worked in Libya (approximately 15%), while they accounted for more than 20% for those based in the UK. Cultural barriers may refer to the rejection of a change in the education system, or it might be as a result of a lack of skills. Furthermore, approximately 5% of the participants working in Libya indicated other barriers that were about security, cost and free time. There are numerical references to confirm this, which are Rhema& Miliszewska (2013); Othman et al., (2013). and (Keats, 2002). Adopting a SWOT analysis approach is useful in terms of identifying the main barriers that faced the participants in terms of implementing e learning.

Satisfaction with the Internet speed on-campus:

Participants were asked to evaluate their satisfaction level with the Internet speed operating on-campus. See Figure 8.

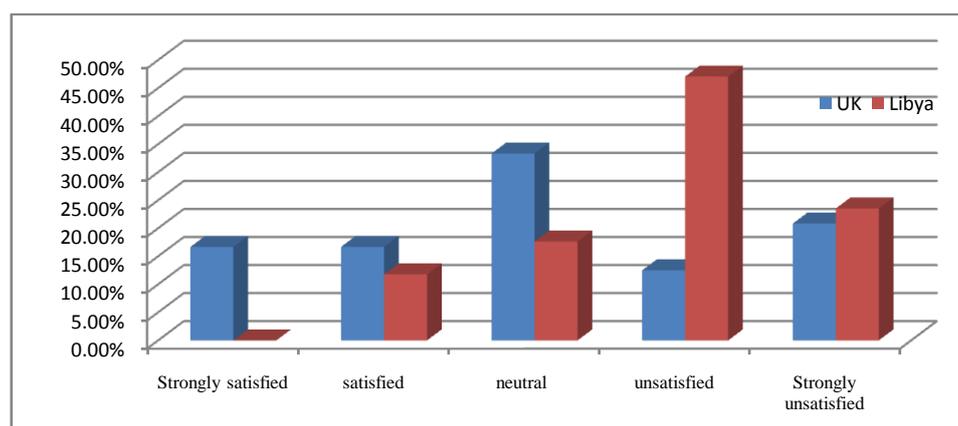


Figure 8. Participants' satisfaction with the Internet speed on campus

According to Figure 8, the majority of the participants working in Libya (approximately 45%) were dissatisfied with the Internet speed provided on campus, while approximately 10% of them were satisfied. In contrast, approximately 20% of the participants in the UK were strongly dissatisfied, whilst more than 30% of them were neutral. The dissatisfaction of the participants working in Libya might be because of a lack of Internet network, disconnection or slow network. Critically, it was unexpected that the majority of the participants studied in the UK would be neutral. That might reveal that they do not consider the importance of Internet quality in enhancing the educational process. The authority of the Ministry of the LHE can affect participants' dissatisfaction. Furthermore, all barriers and difficulties facing the participants can be reflected in their satisfaction level, either negatively or positively.

Cost of Off-campus Internet Access:

Finally, the participants were asked to identify whether Internet cost outside of the campus was expensive. See Figure 9.

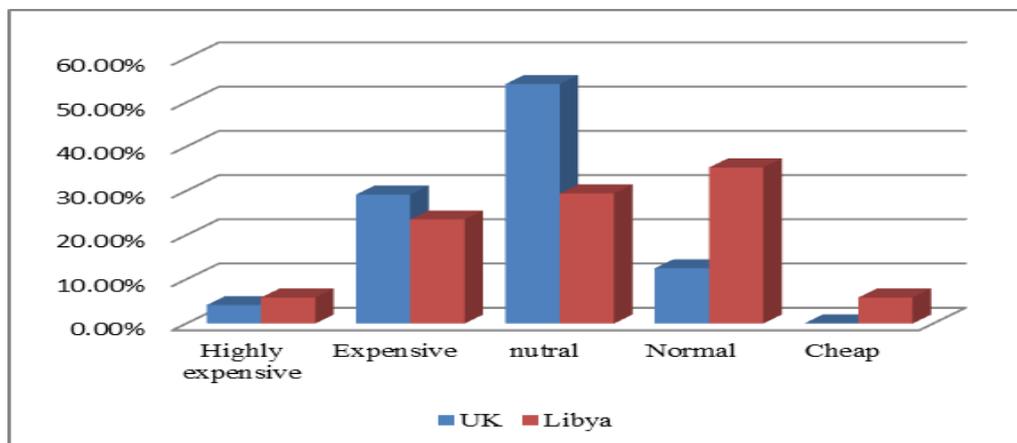


Figure 9. Cost of off-campus Internet access

In Figure 9, the majority of the UK participants (approximately 50%) were neutral, in comparison with more than 25% of those who worked in Libya. That might be because they used the Internet from their offices. On the other hand, more than 30% of the participants working in Libya indicated that the cost of the Internet off-campus was normal, while approximately 20% of them mentioned that the cost was expensive. Hence, implementing e-learning and collaborative learning can decrease the cost of access (Othman et al., 2013).

Libyan Internet bandwidth constraints:

Bandwidth in Libya suffers from a lack of ICT resources, mainly in the HEIs. This is as a result of participating in the educational institutions and increasing license costs for authorisation to connect Lishan; (2003). Most countries in Africa do not have satisfactory international bandwidth. According to Jensen in 2012, almost 60% of African countries have satisfactory bandwidth Lishan; (2003) however, this percentage is less than the normal average of HEIs in developed countries. Only six African countries have a reasonable bandwidth (Jensen, 2012); Libya still needs huge efforts to jump actively into a significant stage of improving the performance of HEIs. Table 2 shows the distribution of outgoing bandwidth in Africa.

African Outgoing Bandwidth	Countries Bandwidth (Mbits/sec)	%
Egypt, South Africa, Morocco	100-500	6
Algeria, Senegal, Tunisia	50-100	6
Botswana, Gabon, Kenya, Nigeria, Sudan,	10-50	13

Tanzania, Zimbabwe		
Angola, Cameroon, Côte d'Ivoire, Libya, Mali, Namibia, Uganda, Zambia	5-10	15
Benin, Burkina Faso, Burundi, Cape Verde, Central African Republic, Chad, Comoros, Congo, DR Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Guinea-issau, Liberia, Madagascar, Malawi, Mauritania, Mauritius, Mozambique, Niger, Rwanda, São Tomé & Príncipe, Seychelles, Sierra Leone, Somalia, Swaziland, Togo	Less than 5	60

Table 2. The bandwidth in Africa (Jensen, 2012).

LHEIs try to override additional challenges that should be concurrently addressed in order to find a suitable improvements policy aiming to address access and high costs of bandwidth:

1. Cost of Megabits of connections is expensive. This affects the availability for the majority of LHEIs.
2. Most LHEIs do not have policies regarding ways in which to optimize their existing bandwidth and manage the circulation and usage.
3. The current infrastructure such as electricity, local intranet and the technical team's skills, is still underlying. It is insufficient to provide high bandwidth exhaustive applications.
4. There is a lack of suitable strategic will and district cooperation between the LHEIs to profit from an economy of balanced or accumulated bandwidth.
5. Incomplete knowledge and limited information about appropriate technologies (optical fibre, satellite types, other bandwidth tools) fit for distinctive settings in the LHEIs.

It is obvious that the limited Internet bandwidth in Libya negatively affects the effectiveness of collaborative learning processes. It is, therefore, necessary to develop ICT strategies, which will contain solutions aiming to improve current learning performance in the LHEIs.

The modern SWOT analysis for the ICT in the learning and teaching in LHEIs:

The SWOT analysis is an essential step to analyse various factors before implementing any solution to improve ICT in teaching or develop collaborative learning at any institution. The success or failure of any collaborative learning system initiative will be directly related to the quality of strategic thinking that underpins it. It is thus important to have a collaborative learning strategy in place before the starting in stage from the implementation process. See Table 3. The collaborative learning initiative must be tied to the institution's core business to ensure that the quality of the educational processes is enhanced Kenan et al., 2013. SWOT analysis should help the decision makers at departmental level to decide on opportunities with respect to choosing the

appropriate policy issues for it, and the following factors should be considered: improvement of learners' knowledge, learning outcomes, efficiency of the teaching and learning processes, and the reductions of costs.

Strength points	Weakness points
<ol style="list-style-type: none"> 1. Annual increase in student numbers 2. The proliferation of digital technology, because the majority of people are using computers and social media channels. 3. The need to eliminate the administrative corruption aspects. 4. Libya has a strategic geographical location in Africa. They could use the collaborative learning packages developed by companies situated in the south of Libya. 	<ol style="list-style-type: none"> 1. Lack of training courses for students, technical and academic staff. 2. Lack of technological support and maintenance for the Lab tools and computers. 3. Lack of online library catalogues in LHEIs. 4. Mismanagement. 5. Post-war chaos that pervades all sectors of Libyan society.
Opportunity points	Threat points
<ol style="list-style-type: none"> 1. The government policy system that looks to support the LHEIs has been changed since 2011. 2. Official recognition of education certificates of distance or collaborative learning. 3. Create new business strategies to attract students from other African countries. 4. Reduce the migration of skilled and intelligent people from Libya. 5. Create a competitive educational environment with neighbouring countries. 	<ol style="list-style-type: none"> 1. Numerous barriers related to collaborative learning processes stages. 2. Preference for using only traditional academic methods in education. 3. Lack of support from the government. 4. Increased migration of skilled and intelligent people from Libya.

Table 3. SWOT analysis for the ICT in LHEIs.

Collaborative learning and the quality of Internet technology:

Collaborative learning has an essential impact on the development of higher education. It has been practiced in various sectors, whether public or private, and in education and business (Keats, 2002). However, collaborative learning could be a constituent part of traditional learning, alongside e learning. It encourages students to achieve their qualifications in higher education, especially those who are located far away. It can also be low-cost and timesaving for both lecturers and students (Othman et al., 2013).

There is a requirement to redesign the current curriculum in LHEIs in order to find a more comprehensive method, and to adopt intelligent multimedia in the current system. In the educational process, there is a need to place emphasis on the basic concepts of acquiring information, providing feedback sessions on the

information, and consider different information processing methods and characteristics (Salmon, 2005).

Firstly, there is a need for students to acquire basic skills for finding information, categorising it and broadcasting or publishing it (Othman et al., 2013). Internet technology is used for improving these skills and obtaining the right perception of the information revolution. The massive recruitments of students in terms of gaining such technological understanding can serve Libyan development plans through their future participation in manufacturing, marketing and global competition Kenan et al., 2013. Secondly, there is another need for the educational curricula in the Arabic world to apply and include Internet technologies.

The means offered by intelligent multimedia, such as the Internet, e-mail, e-motivations, educational videos, and other applications should be used as methods of teaching and learning. Thirdly, it is necessary to work on creating a digital environment such as an Arabic information network, in collaboration with all Arab countries. It should contribute to a higher extent to feed Arabic educational political and economic systems with all necessary data and information. Improving the performance of the HEIs in Arabic countries can therefore be done by adopting collaborative learning, including the courses of training, which should be offered for Libyan lecturers to assist them in finding appropriate methods of electronic data processing, and to achieve the purposes of courses they teach.

Furthermore, the students enrolled in different courses should be trained in the practice of Internet technologies to improve their skills, thereby, attaining better results (Elzawi & Wade, 2012). The lecturers play a fundamental role. They can use and develop different Internet applications and tools such as intelligent multimedia and collaborative learning, which assist them in delivering information to students. Offering appropriate training for the lecturers is necessary to enhance their knowledge and skills, which are relevant to their work performance. However, they are not the only group to successfully adopt and implement it. The students can also reflect a positive learning environment. The training is the main concern of the LHEIs in implementing any form of collaborative learning methods. "Lecturers with inadequate training of e-learning in the real educational environment can pose a problem in balancing the learning process with students" (Kenan et al., 2013).

Conclusion

This paper has displayed the current state of ICT and collaborative learning systems that show that, despite some progress, LHEIs are at a crossroads in formulating ICTs beneficial to their academic projects; it also considers implications for learning and teaching and their development. Regardless of the huge potential profits, it is still unclear as to what influences ICTs may have on teaching and learning. In considering Libya's agenda in research on the ICT and

the higher education system, it is critical to consider the difficult negotiations between different actors such as local different areas, different education levels and the implications of ICT applications to social and organisational development in the LHE system. More coordination and resource sharing between LHEIs could be beneficial as universities move to combine ICT fully into their teaching and learning. The creation of regional policies for sharing information on ICT strategies and courseware and exchanging experiences are critical to increasing the positive contribution of ICTs to higher education.

The LHEIs cannot actually build a respectable collaborative learning or e-learning environment without developments in teaching, research, good networking connections, modern software, and contemporary computer applications development. The highly skilled human resource development is also a foundation of ICT in higher education institutions. The networked learning environment in higher education requires significant government intervention. Government policy has a real impact on strategic initiatives in universities and often determines the parameters of such initiatives through laws, regulations, and the allocation of funds. At the same time, the LHEIs should play a key role in articulating national e-strategies. Universities could play a monitoring, mentoring, and evaluation role in shaping ICT laws and regulations.

This paper focused on the analysis of ICT impact on the effectiveness of collaborative learning processes in LHEIs; though the interview questions with some academics in Engineering school in Tripoli University and Mature Libyan students, divided into two categories, completed a questionnaire: the first category is a group of researchers in the UK who were also full-time lecturers from different universities in Libya; the second category is full-time lecturers from the same universities. Their answers referred time spent on the Internet; time spent using technology in teaching; the value of using intelligent multimedia applications; benefits of e-learning implementation and the barriers that face it. Satisfaction with Internet implementation and cost of off-campus access were also considered.

The findings showed that the participants in the UK were aware of the Internet and intelligent multimedia value, and they spent more time using the Internet than the participants who worked in Libyan universities; however, participants who worked in Libya spent more time in teaching than those in the UK. Furthermore, there was an agreement between both groups of participants that implementing e learning in the LHEIs would increase achievement and that it provided a set of benefits. The most important element of the e-learning implementation was the development of ICT. On the other hand, the main barriers that can face both groups were mismanagement and technological challenges. Additionally, the participants who studied in the UK were more satisfied with the Internet speed provided on-campus than those in Libya were.

Finally, the cost of the Internet off-campus was problematic for participants who worked in Libyan universities. Likewise, the paper has presented other factors

such as intelligent multimedia, internet technologies, knowledge management and how these have a significant influence on creating innovative and inspiring collaborative learning environments, where lecturers are expert designers of intellectual experiences for students who become active participants in the learning processes. In addition, the fundamental role of the lecturers and students in development of the LHEIs was discussed. Finally, the paper concluded that some LHEIs have already shown success in the implementation and management of collaborative learning and Internet technologies and applications; those institutions should be encouraged to share their success with other institutions. There should be cooperation between government teams responsible for the LHEIs. Governmental departments and the private sector should be encouraged to sponsor the development of Internet technologies in HEIs that can produce staff that are competent in such technologies.

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