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A Study on Electronic Learning Drivers and Barriers among Undergraduate Students a Case: Nutrition Department, Faculty of Public Health, University of Benghazi, Libya

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Abstract

Education is the driving force for economic and social development. Considering this, it is necessary to find ways to make education's quality, accessible, and affordable to all using the latest technology available. Accordingly, it is significant to determine all possible drivers and barriers toward electronic learning. This article aims to determine the drivers and barriers of electronic learning among undergraduate students in the Nutrition Department, Faculty of Public Health, the University of Benghazi during the Covid-19 pandemic. More than half of respondents, (59%) are strongly comfortable and confident learning online. Time management, students lecturers interaction were the most positive attitudes to word electronic learning with a percentage of (55%) and (60%) respectively. Electricity disconnection, internet disconnection, lack of computer, laptop and/or smartphone, lack of colleagues support and interaction, lack of computer skills, lack of administrative and technical training support, were the most common barriers mentioned by students. Student attitudes and beliefs towards electronic learning, as well as their satisfaction with technology and electronic learning experiences, are regarded as success determinants of future electronic learning initiatives at Benghazi University. It would be useful to see if the findings presented in this article could be expanded to participants from other disciplines and other universities in Libya via repeat this research in different disciplines and institutions.

According to Nouh F, Elfagi S, and Omar M 2020 and Elfagi S et al 2020; there has been a development in several courses across faculties over the past twenty years. Higher education universities and institutions have incorporated self-learning, active learning, problem-solving based learning, and online courses as components in their programs and the University of Benghazi is not an exception; Programs that include electronic learning approach have a particular interest. Electronic learning is defined as an instructional tool that covers wide components of processes and applications as computer-based learning, web-based learning, digital collaboration, and virtual classrooms. Electronic learning is required to deliver the

instructional content through the audio and videotape, internet, and compact disks "CD-ROM". Electronic learning is often used interchangeably with the terms online education and distance learning in the light of technology-facilitated distance learning. Genena, F.A 2019, and Kasemsap, K., 2017 argued that the justifications for using electronic learning experiences may vary across institutions, faculties, and universities. From a learning point of view, a critical question is whether electronic learning approaches are effective, and given the movement from more strongly classroom-based learning approach, whether electronic learning designs differ in terms of the students learning achievements and outcomes. Moreover, it is also important to explore how students involve in electronic learning and

assess their feedback on its effectiveness. There is a relatively large body of literature on the effectiveness of traditional learning approaches. However, fewer papers assessed the electronic learning approaches in particularly in terms of quality, students' experience and, lectures' perspectives, drivers, and barriers. This is particularly true for undergraduate programs, as much of the literature has paid attention to postgraduate education. Abed, E.K., 2019 stated that the electronic learning approach consists of virtual classes that take place in virtual classrooms; self-based education sessions that are introduced over the internet; collaboration in the form of learning groups, discussion groups, or chat rooms. During electronic learning sessions, learners do not need to be in the same room for teaching and learning to take place. Undoubtedly, learning can still occur while the learners are on different sides of the world. Electronic learning can be classified into two broad denominations, synchronous and asynchronous. Synchronous learning imitates a classroom course, lecture, or meeting using internet technologies. The interaction is direct in synchronous learning; it needs all the participants to be connected at the same time. Asynchronous learning is a web-based model of computer-based teaching. It is typically offered across an organization's local area network (LAN) and/ or on a CD-ROM. The learner can access the course materials at any time at his or her own pace and place. (Abed, E.K., 2019, and Agudo-Peregrina, Á.F 2014) Nutrition Department belongs to the Faculty of Public Health; the last is one of the medical faculties located within the medical campus of the University of Benghazi. The program of the Faculty of Public health consists of five years; pre-medical year, two general years, and two specialization years. The Nutrition Department works within the last two specialization years ((third and fourth year))among The Faculty of Public Health; (Nouh F et al, 2020). According to Adnan, M. and Anwar K, 2020; during the Covid-19 pandemic, several schools and faculties over the world have used electronic learning models to cope with the current circumstances and recommendations of social distance and quarantine to face the pandemic. However, Radha R 2020,

Abbasi S 2020, and Almaiah MA 2020 stated that several drivers and barriers were detected worldwide. The drivers include students' lecturers' interaction, cost, and time management. On the other hand, the most common barriers were less social contact and less technical support. The Department of Nutrition, Faculty of Public Health, at the University of Benghazi has used both synchronous and asynchronous forms of electronic learning during the Covid-19 pandemic. Nouh F et al, 2020, and Rhema, A. and Miliszewska, I., 2012 stated that there are limited publications conducted on the issues that facing Libyan higher education. The Libyan higher education system is very developed in the last decades. However, any system growing rapidly faces mistakes and challenges. The Libyan higher education framework has faced many challenges, particularly in the use of different systems, and models. The quality of higher education in Libya requires more attention. This has made the government come up with various intervention strategies such as electronic learning. The education system in Libya so far has sought to provide multiple approaches through which students can access their teaching programs. (Tamtam, A., Gallagher, F., Olabi, A.G., and Naher, S., 2011). It is argued that there are many aspects of the socio-economic, technological, and environmental barriers that still need attention in developing countries and Libya is not an exception. These aspects include reliable power supply, adequate and effective telecommunications infrastructure, to be able to provide basic educational facilities, and reducing the learner-teacher direct contact ratio to acceptable levels for quality controllers. Electronic learning cannot provide solutions to every issue that may be faced in teaching and learning; it has its barriers and shortcomings like any other teaching or learning approaches. (Linton, J.N., 2017). The current paper aims to determine the drivers and barriers of electronic learning among undergraduate students at the Nutrition Department, Faculty of Public Health, the University of Benghazi during the Covid-19 pandemic. This paper will introduce the only descriptive status of the Nutrition Department experience. It is not within the scope of this paper to provide any association between

different variables. It only tries to shed the light on this experience.

It is a cross-sectional study. Informed consent was obtained from subjects who were also assured of the confidentiality of the information collected. 185 students out of 210 students at the Department of Nutrition participated in this study; given the response rate (88.1%). The questionnaire was programmed to be filled using standard web browsers. The questionnaire was designed so that, as each student finished and submitted the questionnaire, the response was transported into an output file and imported into SPSS© (Statistical Package for the Social Sciences). Respondents were asked to rate each of the drivers and barriers on a 1–5 Likert scale. To announce this study, the authors sent a brief

2. Results and Discussion

Students in the Department of Nutrition participated in this study. Out of 210, 185 students participated; given a response rate of (88.1%). Regarding gender distribution, seven subjects are males (3.8%) and 178 subjects (96.2%) are females. There are (35.1%) of the subjects are enrolled in the third year, and (64.9%) are enrolled in the fourth year. Regarding age distribution, 176 (95.1%) of the subjects are between 18- 24 years as shown in the following table. In terms of the advantages of electronic learning; when rating their comfort level with electronic learning, more than half of respondents, 59% ($n = 109$), are strongly comfortable and confident learning online; and only 3% ($n = 6$) strongly discomfort to use electronic learning. When asking the subjects about using electronic learning as an alternative method during the Covid-19 pandemic; the majority of the students 70% ($n = 130$) strongly enjoy electronic learning during the Covid-19

Moving to barriers to electronic learning; electricity disconnection, internet disconnection, lack of computer, laptop and / or smart-phone, lack of colleagues

1. Methodology

description to all the students throughout the online study groups. Data were collected from the first of August to mid-September 2020. The questions on the questionnaire were grouped into three parts corresponding to the results of students' characteristics, the technology and infrastructure services, lecturers, and support of the Nutrition Department. Responses with large sections of missing information were not accepted. Additionally, responses that had the same rating for every driver and barrier item (such as all no barriers) were classified to have not been mindfully filled and were therefore deleted. After data cleaning, 185 valid questionnaires remained and were analysed using SPSS©.

pandemic. Consequently, when talking about time management more than half of the respondents, 55% ($n = 102$), strongly save and manage their time during electronic learning than traditional learning. Further Advantage of electronic learning according to the current respondents is students lecturers interaction; more than half of respondents, 60% ($n = 111$), are strongly feel more comfortable to contact with lectures and ask them via different technologies applications during all the day than visiting them in their offices. Regarding cost; the students mention that there is no difference between the traditional learning method and the electronic learning method. They justify that the cost of transportation and having breakfast in the university is now using in recharging the internet line. 71% ($n = 131$) of the subjects mentioned that; there is no difference in cost between traditional and electronic learning.

support and interaction, lack of computer skills, lack of administrative and technical training support, were the most common barriers mentioned by students.

81% (n=150) of the students mentioned that they were unable to participate in many electronic sessions due to electricity disconnection. They mentioned that electricity disconnection was the biggest barrier to moving to, participate, and enjoy electronic learning. Half of the respondents 50% (n=93) strongly insist on that internet disconnection prevent them from participate and perfectly benefit from electronic learning. More than half of the respondents 51% (n=94) mentioned that lack of computer, laptop, and/or smart-phone was the barrier to participate and

Table : Subjects Characteristics

Characteristics	Total No (%)		Total
	Male	Female	
Age (Years)			
18-24	7(3.8)	169(91.3)	176(95.1)
>24	0(0)	9(4.9)	9(4.9)
Total	7(3.8)	178(96.2)	185(100)
Age (Years) Mean ± SD	22 ± 2.3	23 ± 1.5	22.5 ± 1.9
Academic Year			
Third Year	5 (2.7)	60(32.4)	65 (35.1)
Fourth Year	2(1.1)	118(63.8)	120(64.9)
Total	7(3.8)	178(96.2)	185(100)
Last Year Level			
Fail	0(0)	0(0)	0
Pass	1	16	17
Good	4	64	68
Very Good	2(1.1)	80	82
Excellent	0	18	18
Total	7(3.8)	178(96.2)	185(100)

Figure (1): Drivers to Electronic Learning

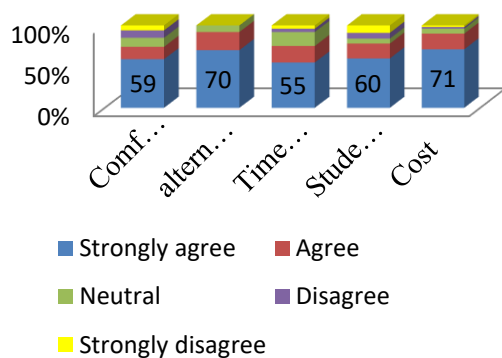
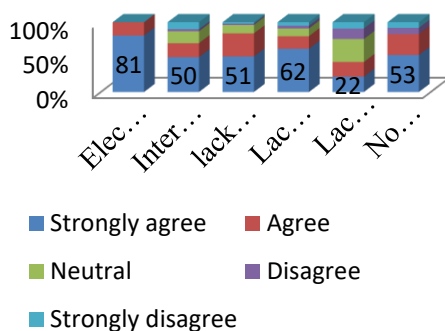


Figure (2): Barriers to Electronic Learning



The current article presents findings from the study that examining Libyan students' drivers and barriers

totally benefit from electronic learning. On the other hand, 62% (n=115) of the students mentioned that lacking computer skills was a significant barrier to enroll in electronic learning. Furthermore, 22% (n=41) of the students state that lack of administrative and technical training and support prevents them from enrolling in the electronic learning session perfectly. More than half 53% (n=98) of the respondents state that the interaction and sharing materials and discussion with their colleagues decrease during electronic learning.

of electronic learning at the Nutrition Department, Faculty of Public Health, the University of Benghazi. A comparative description in the current study has pointed out that the study subjects were positively comfortable towards electronic learning and recognised its benefits. These positive attitudes and the readiness of students to engage in electronic learning courses indicate that future electronic learning initiatives have a great prospect in Libya. These findings are similar to the results of studies conducted by (Rhema et al 2012 at Victoria University, Australia, Suri, and Sharma 2013 at Punjab University in India, and Hussein I 2007 in Pakistan). One of the considerable challenges posts the Libyan 2011 struggle is the development and reconstruction of the country's education system. It has been recommended in the literature that electronic learning could be used to improve the quality and relevance of higher education and to support the affected learners and lecturers in Libya. (Hbaci, I., Ku, H.Y. and Abdunabi, R 2020), (Taher, A.M.A. and Dahari, R., 2012) and (Suri, G., Sharma, S 2013).

Most of the participants in the current study reported that electronic learning is a suitable alternative method for learning during wars and pandemics. Authors indicate that several articles assess the importance and efficacy of implementation of electronic learning during Covid-19 pandemic. Many educational institutes across the world are promoting electronic learning as a teaching approach and it is being widely appreciated by the students. There are numerous justifications for its acceptability such as flexibility and better control over the unstable environment. (Radha R 2020, Abbasi S 2020, and Almaiah MA 2020)

Regarding time management and cost, the current participants (55%, 71% respectively) indicate that electronic learning makes them save and manage time more than traditional learning and there is no difference in cost between traditional and electronic learning. These findings regarding time and cost are opposite the available literature. Literature reported that electronic learning may lead to heavy use of some internet sites. This may lead to unanticipated costs both in cost and time. These publications added that electronic learning as a strategy of education makes the learners suffer to remoteness, contemplation, as well as lack of relation and/or interaction. Accordingly, it requires a very strong time management skills and motivation to reduce and/ or improve the negative and positive effects of electronic learning. (Collins J et al. 1997 and Soyulu S 2006)

Further Advantage of electronic learning according to the current research is regarding students-lecturers interaction. More than half of respondents, 60% (n =111), are strongly feel more comfortable to contact with the lectures and ask them via different technologies applications during all the day than visiting them in their offices. Using of electronic learning improves interactions and participation patterns between learners and lecturers. Furthermore, electronic learning results in the removal of place and time constraints due to the high availability and accessibility of the information. Accordingly, electronic learning may provide an opportunity for higher education institutions to reach out the society, which previously had little interaction with higher education institutions. (Zabunov, S., and Ivanov, K. 2003)

Moving to electronic learning barriers among the subjects of the current study, 81% (n=150) of the students mentioned that they were unable to participate in many electronic learning sessions due to electricity disconnection. They mentioned that electricity disconnection was the biggest barrier to moving to, participating, and enjoying electronic learning. Almost all technological and communicational tools require a steady supply of electricity to function. Unfortunately, the electricity

supply in Libya is not available in many areas for many hours on a daily base. The irregular supply of electricity is a serious problem that is affecting all sectors of life in Libya. According to the Energy Sector Management Assistance Program of World Bank (2018); the electricity supply in Libya dramatically has decreased from 97.061% during 2001 to 67% during 2018. This dropout negatively affects all sectors in Libya and higher education is not an exception. Electronic education settings do not have generators as a backup in many countries; thus it may not be possible to depend on electronic learning rather than traditional classroom instructions. Another consequence of electricity disconnection is the lacking of immediate response comparing to a face-to-face classroom setting. (Okaz, A, 2015)

Half of the respondents 50% (n=93) strongly insist on that internet disconnection prevent them from participate and perfectly benefit from electronic learning. the networks that work badly affect the productivity of users. For instance, if an internet-based electronic learning system is not fast, users will not only need extra time to complete their work, but they also become discouraged, increasing the negative effect on the learning experience. It is further reported that limited internet access means lower performance, more time required for downloading lectures. One of the issues that students may face during electronic learning is that students may be unable to connect during real-time sessions. Some students may connect and want to continue while others cannot connect and are calling the lectures for support. In some cases, it may be that students are not able to download courses' materials, or they can download, but cannot decompress these materials. Accordingly, the Libyan higher education sector has to come up with solutions on how to improve challenges caused by internet problems. (Weippl, E.R, 2005)

More than half of the respondents 51% (n=94) mentioned that lack of computer, laptop, and/or smartphone was the barrier to participate and perfectly benefit from electronic learning. Access to a computer and ownership of computers are factors influencing student attitude towards

electronics. Cost and availability of telecommunications infrastructure and supplies are the major factors that affect electronic learning. The majority of Libyan learners do not have access to personal computers and the internet. It is estimated that in Libya personal computer density is low. Elkaseh, A.M., Wong, K.W., and Fung, C.C., 2015 in their study regarding the acceptance of electronic learning as a tool for teaching and learning in Libyan higher education stated that comparing to other countries, Libya is still a way behind in students- computer ratio. Comparing it to other countries, in the United States, the percentage of computers available at secondary school is 73% and 78% for the United Kingdom. The above-indicated figures show an alarming concern for the success of electronic learning in Libya. Access to the computer is one of the basic requirements for online learning to take place. Furthermore, Porter and Yegin, 2006 stated that the use of new technology in the Libyan higher education system such as computers and multimedia is way behind international best practice .(Charalambou M, 2011)

On the other hand, 62% (n=115) of the students mentioned that lacking computer skills was a significant barrier to enrol in electronic learning. Students may face barriers in terms of accessing electronic classroom material due to a lack of information technology knowledge. Technology illiteracy is one of the foundation barriers of electronic enhanced learning. One of the most significant pre-requirements of electronic learning is familiarity with computers. The lack of familiarity with computer-based learning harms the students' confidence. The lack of technological skills among learners obstructs the learning chances offered by lectures and acts as a barrier to effective learning. It is mentioned that learners who have never used computers may even be discontented to press the keys in fear of damaging the computer. Students should have a basic understanding of how both software and hardware systems. Students should have basic computer skills such as writing, typing, and study practice to succeed in electronic learning. Technical issues can inhibit students and can restrain the progress of learners. The lack of

computer skills could also affect e-learning, group participation. (Holley D and Oliver M 2010)

More than half of the subjects and equals to 53% (n=98) of the respondents state that the interaction and sharing materials and discussion with their colleagues decrease during electronic learning. regarding improvement of students' communication skills, electronic learning may have a negative consequences. Though students may have an excellent academic knowledge, they may not possess the needed skills to deliver their acquired knowledge to their colleges. It is argued that the analysis of the requirements of the target audience, collection maintenance and use of students' information is critical issue in electronic education. Students are not often met face-to-face; extra efforts require to be achieved to understand the needs of students and varying contexts to avoid unnecessary dropout of students. Accordingly, the curriculums and learning materials should be designed in such a structure that they increase students' interaction such as team based works, role play, and group work. Moreover, there could be social and cultural influences, and unwillingness to be independent learners, that consequently decreases the success rate of electronic learning. This drawback could be due to unwillingness to operate outside their comfort zone. Establishing social interaction and socio-emotional relations with colleges, and increasing interactive learning, would work more in a real classroom than in an electronic one.(Kala, S, Isaramalai, S.A. 2010,Paechter M 2010)

Lacking of administrative and technical training support was an important point rising by the respondents. (22%) of the students state that lack of administrative and technical training and support prevent them from enrolling in the electronic learning session in perfect way. One of the challenges that may be Libyan higher education sector face is the lack of an information technology national policy framework. It is very significant to ensure the support of higher administration when implementing electronic learning. For electronic learning to be successfully established in a university, senior administration should buy into the ideas. Therefore lack of administrative members to

support course and academics is proposed to be a barrier to electronic learning in higher education. It is important for the administration to support an environment that facilitates faculty to habituate to with information technology and its potential uses in effective way. Similarly, lectures need to be trained to offer information technology support during troubleshooting problems. Furthermore, lecturers need to be flexible in continuously updating their course materials due to the technology changing.(Elkaseh, A.M 2015; Choi, D.H., 2007 and

J 2009)

3. Conclusion

The findings of the current study could serve as a predictor of the attitudes of students towards electronic learning. It can be considered as a source of information for academics, researchers, administrators, and decision-makers involved in planning, implementation, monitoring, and promotion of electronic learning in Libya. However, for electronic learning to be widely accepted in higher education organizations in Libya there is a need for the provision of appropriate training programs at different settings and levels. These are important tasks that require substantial attention and great effort from the Libyan government to ensure the development of positive attitudes, adequate awareness, and improved motivation towards electronic learning. An information technology helpdesk should be available for support and should deliver speedy services as delayed responses affect the learning process for the students. The focus should not be on students support only; maintenance and technical support for the whole university should be established, and well designed plans should be put into consideration especially in term of electricity and internet supply. The overall literature which assesses the drivers and barriers of electronic learning suggests that its successful implementation should ensure the participation and support of faculty, administrators and students to enjoy the full benefits that come with its implementation and adoption. The current study has some limitations. The authors realize that the current research only

involved students from one higher education institution is a limitation of the current study. Accordingly, the researcher will not generalise the results of the study but would rather contextualise the study. It will be more valid if more students, lectures and administrators could involve in the study. There is limited Libyan literature that address barriers to electronic learning in higher education, the researchers referred to international literature for some arguments in the study and this is another limitation of the current study.

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