Journal of Positive Psychology & Wellbeing
2022, Vol. 6, No. 1, 366 – 381

http://journalppw.com
ISSN 2587-0130

Barriers to the Use of Technology in Education and Methods to Address from Teachers' Perspectives

Essa A. Alibraheim[1], Loloua S. Alsaad[2]

[1]*Assisstant professor, College of Education, Imam Abdulrahman Bin Faisal University,*
ealibraheim@iau.edu.sa
[2]*Graduate student, College of Education, Imam Abdulrahman Bin Faisal University*

Abstract:

The aim of this study was to investigate the possibility of the existence of barriers to the use of technology in education and identify the significant barriers so as to address them from female teachers' perspectives in the Kingdom of Saudi Arabia. To achieve this, an online survey was designed and shared with 192 female teachers. The quantitative data was analyzed with descriptive statistics and t-test sample, while the qualitative data was analyzed inductively to be categorized according to existing and emerging themes. The results showed that seventeen significant barriers were found, including: lack of technological means; lack of incentives; lack of Internet; lack of classrooms or inadequate classrooms for the use of educational technology; hardware, network and software malfunctions; lack of maintenance; unavailability of updating and developing hardware, network, and software; the scarcity of technology-based curricula; lack of training courses; lack of participation of teachers and their supervisors in developing curriculum and educational technology; lack of technology matching students' levels; difficulty in using software and hardware based in foreign language; supervisors' poor guidance in the use and production of educational technology; short class times; and difficulty of educational technology production. Some recommendations that were suggested to address these significant barriers were as follows: providing hardware and Internet network in classrooms, intensification of training courses for female teachers in the use of technology, providing a suitable school environment for the use of technological means, the need to hold training courses to develop learners' skills in the use of technology, and interest in the maintenance and development of hardware, equipment, software, and networks periodically.

Keywords: Technology, Barriers to use technology, Descriptive Methodology, Female Teachers' Perspectives, Saudi Arabia.

1. Introduction:

For decades the information and communication technology (ICT) has been prevalent in all fields and has evolved rapidly, connecting all human beings to facilitate spontaneous and irresistible interactions. The ICT has been facilitating and simplifying difficult tasks for people so that they may utilize them even in education.

Therefore, education has become the most important standard to measure a nation's progress among the countries of the world. For instance, the Kingdom of Saudi Arabia launched Vision 2030 in 2017 and aspires to implement this vision's blueprint, whose most important goals are to promote education, and whose success depends to a large extent on technology (Al-Shuaibi, 2017).

For the purpose of technology integration in education, the teaching and learning process has been adapted by teachers in many countries where using ICT has brought about changes to classroom teaching and learning as well as the curriculum (Kozma, 2003).

According to the U.S. Department of Education in 2002, a federal legislation mandate emphasized the integration of technology into

all K-12 classrooms. Based on this directive, educators and leaders should design plans to use technologies in classrooms in order to produce technologically skilled students (Pine-Thomas, 2017). Using ICT in education is believed to empower both teachers and students and make the educational process more interactive as well as induce educational reforms that make students more productive and knowledgeable workers (Pelgrum, 2001).

The technology integration in education and the use of e-learning overcame crises and addressed issues. For instance, e-learning provides interaction between teachers and learners as well as between learners and their peers; it also allows communication between them simultaneously and asynchronously, provides greater flexibility, removes geographical barriers, and helps physically disabled persons get better educational opportunities (Peramunugamage & Halwatura, 2013). Therefore, technology integration in education provides benefits and alleviates the digital divide to make the approach learner-centric as opposed to teacher-centric (Singhavi & Basargekar, 2019).

Despite the fact that using technology in education has many advantages and using technology in education has developed the skills of both teachers and students globally, there are several barriers for all stakeholders involved (Joseph, 2012). It has already been confirmed by most studies that the adoption of technology in education may be encountered with some obstacles and difficulties to educators (Bingimlas, 2009; European Schoolnet, 2006).

As a result, the purpose of the current study is to investigate whether there are barriers to the use of technology in education and identify the significant barriers in order to address them as viewed from teachers' perspectives. The importance of this study consists in the actual need to understand and overcome the barriers facing teachers while using technology in education at the present time. This study can also provide recommendations and suggestions which may enhance the quality of educational processes. It might provide feedback to the stakeholders of the educational institutions to support the development of education using ICT.

This study attempts to answer the following questions:

1- Are there barriers to the use of technology in education?

2- What are the significant barriers to the use of technology in education from female teachers' perspectives?

3- What are the proposals to address potential barriers to the use of technology in education as seen from the point of view of female teachers?

2. Literature Review

2.1. Theoretical Foundation:

Many studies differ in classifying barriers to the use of technology in education. However, all studies seem to have familiarity to the identifiable barriers. Due to the multiplicity of the factors affecting the use of technology in education, international studies tend to classify these influential factors (barriers) so as to facilitate addressing them (Al-Shraideh, 2017).

One of these studies identified barriers affecting the use of technology in education and placed them under three categories. This is shown in Chambers' study (2019), which researched the barriers affecting teachers' integration of technology in classrooms and classified them as barriers of three degrees. According to Chambers, first-order barriers (extrinsic to teachers) are related to equipment and resources, including slow Internet connection, technology malfunctions, insufficient number of equipment in classrooms, lack of software and hardware, lack of funding, lack of technical support, lack of security measures, and lack of administrative support. The second-order barriers (intrinsic to teachers) are related to knowledge or skills and beliefs or attitudes, including inadequate technology skills, lack of training, and lack of confidence or competence. The third-order barriers (contextual) are related to structure or organization and school culture or climate, including length of class periods, low student to computer ratio, insufficient time within the school day for planning instruction and developing skills, and lack of parental community support.

Alkhawaldeh (2014) in his study viewed the barriers to the use of ICT in education and

classified them based on the technology-to-performance chain model by Goodhue and Thomson, 1995 (TPC model) as a conceptual framework to recognize and address these barriers. According to the antecedents of utilization in this model, these barriers are classified as: related to the expected consequences of use and affect toward use, related to habit, related to social norms, related to facilitating conditions, and barriers that cannot be associated directly with antecedents of utilization. The first category of barriers related to the expected consequences of use and affect toward use refers to negative beliefs and feelings toward using ICT in education and in turn reflects disbelief in ICT benefits and lack of confidence. The second category of barriers related to habit refers to resistance to change. The third category of barriers related to social norms indicates lack of institutional support, and lack of incentives and motivation. The fourth category of barriers related to facilitating conditions refers to lack of funding, lack of computers, lack of Internet access, lack of technical staff, lack of infrastructure, lack of training, lack of time, lack of sharing of best practices, and lack of maintenance. The fifth category of barriers that cannot be associated directly with antecedents of utilization indicates lack of ICT skills, difficulty of integrating technology into education, and transferring teachers.

Other studies (e.g., Hew & Brush, 2007; Inan & Lowther, 2010; Kopcha, 2012; Reinhart, Thomas, & Toriskie, 2011; Ritzhaupt, Dawson, & Cavanaugh, 2012) identified technology integration barriers and classified them into the following categories; "access to technology tools and resources, technology training and support, administrative support, time to plan and prepare for technology integration, and beliefs about the importance and usefulness to technology tools and resources" (Francom, 2016, p. 577-578).

According to Bingimlas (2009), these barriers of using technology in education are put under two categories: teacher-level barriers and school-level barriers. Bingimlas discussed teacher-level barriers and limited them to lack of teacher confidence, inefficiency, resistance to change and negative attitudes while school-wide barriers are limited to lack of effective training, lack of time, lack of technical support, and lack of access.

Another study by Riasati, Allahyar and Tan (2012) identified all barrier to the use of technology in education and classified them into the following categories: lack of access to technology resources, lack of effective training, teachers' attitude, students' attitude, lack of time and technical support. Here adding the students' attitudes besides the teachers' attitudes is regarded as a barrier to the use of technology in education since the process of education is focused on the learners' autonomy.

Even the language may be considered a barrier to the use of ICT in education. Some teachers can rely only on their native language, so they face difficulty in using computera or computer programs when programmed in English. It is asserted in both studies of Zaytoon (2005) and Golam (2008) that the English language caused significant obstacles to the use of ICT in teaching for teachers who can speak only Arabic.

In spite of the difference in classification to barriers, all researchers tend to be somewhat similar in identifying these barriers. To sum up, there seem to be more negative factors that influence the use of technology in education and are identified as barriers: insufficient class time, lack of funding, lack of hardware and software, lack of training, lack of incentives, resistance to change, poor skills in using educational technology, teachers' beliefs and attitudes towards the significance and usefulness of ICT in education, lack of teachers' confidence and competence, lack of administrative support, language barrier, lack of technology-based curriculum. All these barriers have mutual relationships, thus there is complication when addressing them. It is necessary to take all barriers to the use of ICT in education into consideration and deal with them as a whole issue to address rather than individual barriers.

2.2. Previous Studies:

There are some of the studies which are related to this current study concerning the barriers of using technology in education from the teacher's perspectives. These studies are listed and detailed as follows:

Al-Zuwaini, Mussa and Hameed (2020) investigated the obstacles to the application of e-

learning from the viewpoint of Arabic language teachers. A questionnaire of 30 items was distributed to a sample of 250 male and female teachers who teach in the Arabic language. After collecting and analyzing data, the researchers found that there were high-level obstacles which caused failure to applying e-learning in elementary schools. These obstacles consisted of insufficient computers in schools, inadequate classrooms to e-learning, lack of training for teachers to use computers in teaching and lack of programs designed to teach the Arabic language. To address these obstacles, the researchers recommended training courses for teachers in the use of computers and Internet, new software design that support all types of tests and the Arabic language curriculum, and providing funds to obtain modern technologies.

Nouri and Mahdi (2019) aimed at revealing the most important barriers that high school Iraqi teachers encounter when using modern technology. They also tested the influence of gender upon these barriers. After selecting a random sample of 176 male and female teachers (88 males and 79 females), a survey questionnaire consisting of 24 items was distributed and collected. The findings showed that there were major barriers in the use of modern technology and these barriers were categorized as material, technical, and human. These barriers included the increasing class size, lack of cooperation and coordination between schools in exchanging technological expertise, difficulty providing technical support, high cost of software, lack of technologically skilled teachers, lack of training, and lack of computer devices. Based on the aforementioned results, the researchers made recommendations concerning the need for teacher training in the use of technology for the purpose of improving teaching and learning, allocating sufficient funds to provide modern technologies, and advocating to spread the culture of using modern technology, particularly in education in the community.

Issa and Saleh (2019) in their study aimed to identify the difficulties of using modern educational technology by a sample of faculty members in the Faculty of Basic Education, Mustansiriya University. The study sample was 362 faculty members (170 males & 192 females). The researchers built a questionnaire to determine the difficulties that prevent the effective use of technology and whether there was a relationship between variables (scientific title, specialization, academic qualification, and years of experience in university education). The results revealed the existence of some obstacles hindering the use of technology in education. The main obstacles were lack of equipment and infrastructure, lack of training courses in the use of modern technology in teaching, lack of incentives, inconvenient halls for the use of technology, difficulty in moving devices and equipment to other halls, lack of time, lack of technology that matches the students' cognitive levels, and lack of participation of supervised teachers in developing technology-based curriculum. The researchers recommended to hold training courses for teachers to use technology and provide hardware and software.

Abdulhaleem and Abdulaziz (2018) aimed to identify the challenges and difficulties in the application of educational technology in primary schools from the teachers' viewpoint in Algeria using mobile education as a model. A semi-structured interview was designed to collect data from a sample of 30 teachers in primary schools. Using the content analysis in analyzing the data, the study results indicated that there was an insufficient integration of mobile education in primary schools due to various difficulties categorized as: self, administrative, technical, material and security. The category *Self Barriers* belongs to the teacher himself/herself including teachers' refusal to use the modern technology in education and their commitment to the traditional methods, their passive attitude to the use of technology in the classroom and their belief of insignificance of using it. The second category *Administrative Barriers* refers to lack of awareness on the part of educational institution officials and their strict system strategy to education. The third category *Material Barriers* indicates lack of funds to support educational technology, lack of teacher training and incentives to use technology in education. The fourth category *Security Barriers* refers to the lack of secure networks, software programs, and computers. The last category *Technical Barriers* refers to the lack of qualified technology experts to fix malfunctions in computers, programs and networks and performing timely maintenance. Based on these results, the researchers addressed these barriers with suggestions including redirection of the educational objective strategy to be flexible to

integrate the ICT in educational institutions and developing and funding the infrastructure. Also, there should be a higher student to computer ratio and incentives and training courses should be provided for the teachers.

Al-Zou'bi (2019) in his study aimed to investigate the problems of using technology in education that the first to third grade teachers face in Irbid City. A random sample was taken and consisted of 241 male and female teachers. The study tool was a questionnaire which consisted of 39 items. 24 items were related to the problems of using technology in education and 15 items were concerned with the teachers' attitudes in using technology in education. The findings showed that the mean (average) of the difficulty level of problems of using technology in education was high from the teachers' perspectives. These problems were categorized as problems related to administration and equipment. The problems most frequently presented were lack of time in the classroom, burden on teachers carrying out other administrational tasks, inadequate classrooms to the use of technology, high class size, insufficient funds to support educational technology, and lack of training teachers in the use of technology. The researcher also recommended providing modern technological tools (hardware and software), providing financial support for the educational technology, training teachers to use the educational technology and relieving the burden of tasks placed on teachers.

Chambers (2019) investigated the barriers facing teachers when integrating technology into the classroom. He selected a random sample of 285 teachers teaching from 7th to 12th grades in an urban school district (District K) in the State of Missouri where 1:1 initiative was implemented in the school year 2014-2015. A survey was distributed to collect data. The researcher classified these barriers into three degrees. Chambers identified first-order barriers as support, equipment, and resources. Second-order barriers were identified as attitudes/beliefs and skills/knowledge. Third-order barriers are identified as the structure/organization and culture of the school. The results showed the strongest response from teachers to first-order barriers as significant barriers to the use of technology in the classroom. Some of these big flaws were the network system and/or filters that blocked internet sites, lack of budget, and outdated technological hardware.

Singhavi and Basargekar (2019) aimed to identify the barriers in the use of ICT from teachers' perspectives in the classroom in Maharashtra, India. The researchers took a random sample of 515 from various schools in the Greater Mumbai Metropolitan Region. They used a questionnaire that was composed of 25 barriers in using ICT in the classroom. Using the ranking order method for the importance of barriers perceived by the surveyed teachers from both schools, the researchers found that these barriers were extrinsic (external) in nature. The most important barriers common to the teachers of both schools were lack of computers supported by the Internet, insufficient Internet connection, lack of educational programs, lack of appropriate educational models and lack of sufficient time. The other barriers that got low ranking were lack of priority of ICT by school management and parents, negative attitude of teachers, uselessness of ICT, and lack of confidence in the use of ICT. The study recommended providing the teachers with training programs and making an investment in facilitating ICT in education with regard to number of computers and access to the Internet.

Doshmanziari and Mostafavi (2017) attempted to examine the barriers in the use of educational technology in the learning process of primary school students in District 13 in Tahran. A random sample of 124 teachers was taken in the form of a questionnaire to collect data. The findings showed that there were human factors, physical factors, and cultural factors, the varied and different course content, failure to provide services and support to teachers, poor teachers' computer skills, and teachers' resistance to changes.

Al-Hawamidah (2011) in his study aimed at revealing the barriers to using e-learning from the viewpoint of faculty members at Al-Balqa Applied University. He also sought to know the impact of academic specialization and getting the International Computer Driving License (ICDL) upon these barriers. To achieve these objectives, Al-Hawamidah developed a questionnaire consisting of 24 barriers to be distributed to a sample of 96 faculty members. He concluded that there were significant barriers to using e-learning. First, the most significant barriers were related to the administrative and

material aspects such as lack of equipment and computers with Internet connection and insufficient facilities. Second, the significant barriers related to e-learning were represented in the high cost of software and lack of learning applications. Third, the barriers were related to teachers and students who are technologically skilled. Concerning the impact of getting ICDL by faculty members on barriers in using e-learning, there was no statistically significant difference. Some recommendations to overcome these barriers were to provide the infrastructure for e-learning, training both teachers and students on how to manage e-learning, and developing programs to e-learning.

3. Methodology

3.1. Participants:

An online survey was designed and shared with female teachers in the Kingdom of Saudi Arabia who participated voluntarily. Consequently, 192 female participants responded to the questionnaire items. This study sample varied to represent female teachers at all grade levels in public and private schools in the Eastern region and other regions in the Kingdom of Saudi Arabia.

3.2. Instrumentation:

Using the descriptive analytic method is appropriate for the quantitative and qualitative data. Therefore, a questionnaire was required to describe and analyze the barriers in the use of technology in education. After reviewing this and previous studies, the questionnaire items were formulated as follows:

The first section contained demographic information related to the study participants such as gender, educational region administration, school type, qualification, years of experience, training course number, school grade-levels taught and kind of subjects taught.

The second section contains: (1) one close-ended question with "Yes/No Answer" to reveal the existence of barriers to the use of technology in education, (2) 23 items identifying barriers to the use of technology in education, and (3) one open-ended question to elicit teachers' responses from their perspectives to address these barriers. According to the level of their agreement or disagreement (Agree = 3, Neutral = 2, Disagree = 1), the participants were asked to indicate each item barrier (variable) they encounter when using ICT in education.

After the completion of the questionnaire formulation, it was presented to five faculty members to check the validity of it and give approval. Also, for further validation, a survey was distributed to 21 teachers as a pilot study, to calculate the reliability, which was 0.887.

Finally, the reliability of the survey of this study was calculated by using Cronbach's Alpha and the value of Alpha Cronbach's coefficient was 0.89.

3.3. Data Analysis:

Through using SPSS, the participants' responses were coded and processed. The descriptive statistics were applied to obtain the arithmetic average (mean), standard deviation (SD), frequency, and percent. Using the One Sample T-test, the mean of all barriers (variables) were compared with the assumed mean (2) for the purpose of identifying the level of significance. Concerning the third question of this study which was an open-ended question, the responses here were qualitative data, so the content was analyzed inductively to be categorized according to existing or emerging themes. Then frequency and percent were used for these themes.

4. Results:

The main goal of the current study was to investigate the possible challenges in the use technology in education and to determine the significant barriers to address from female teachers' perspectives in Saudi Arabia. The sample size of this study was 192 Saudi female teachers in different stages and majors.

Table 1 illustrates the distribution of the participants, female teachers, according to the administration of educational region. Most of those surveyed female teachers with 92.7% were distributed in the Eastern Region whereas the other female teachers with 7.3% were distributed in Other Regions of the Kingdom of Saudi Arabia.

Table 1:

Administration of educational region that participants belong to

Administration	N	%
Eastern Region	178	92.7
Other Region	14	7.3
Total	192	100

Table 2 provides the type of school where the surveyed female teachers are employed. Most of the female teachers, 73.4%, were teaching in public schools while 26.6% of female teachers were teaching in private schools.

Table 2:

Type of school

School	N	%
Public	141	73.4
Private	51	26.6
Total	192	100

Table 3 shows the educational background of the surveyed female teachers. The majority of female teachers, 99%, had a bachelor's degree whereas only two female teachers, 1%, had a master's degree.

Table 3:

Participants' qualification

Degree	N	%
Bachelor's	190	99
Master's	2	1
Total	192	100

Table 4 illustrates the years of experience the surveyed female teachers had. Little more than half of the female teachers (52.6%) had 11 years or more experience teaching, 25.5% of the participants had 6 to 10 years of experience teaching, and finally, 21.9% of the sample had one to five years of experience teaching.

Table 4:

Educational experience years

Educational experience	N	%

1-5 years	42	21.9
6-10 years	49	25.5
11 years and more	101	52.6
Total	192	100

Table 5 provides the number of training courses in using ICT in education that were taken by the surveyed female teachers. More than half of the female teachers (60.9%) took more than five training courses, 34.4% of female teachers took five or fewer training courses, and 4.7% of participants did not take any training course.

Table 5:

Number of training courses

Training courses	N	%
5 or less	66	34.4
More than 5	117	60.9
None	9	4.7
Total	192	100

Table 6 shows the grade levels that the surveyed female teachers teach. (37%) of female teachers were teaching in high schools, 33.3% of female teachers were teaching in elementary schools, and 29.7% were teaching in middle schools.

Table 6:

The educational level in which the participants work

Stage	N	%
Elementary school	64	33.3
Middle school	57	29.7
High school	71	37
Total	192	100

Table 7 illustrates the variety of subjects taught by the female teachers. More than half of the female teachers (62%) were teaching subjects in literacy whereas 38% of participants were teaching scientific subjects.

Table 7:

Kind of subjects to teach

Subjects	N	%

Literary	119	62
Scientific	73	38
Total	192	100

To answer the first question of this study *"Are there barriers in the use of technology in education?"* Table 8 shows the participants' answers. More than half of the participants (56.3%) believed that there are barriers in use of technology in education, while the rest disagree with this statement.

Table 8:

Participants' responses to "Do you face barriers in the use of technology in teaching?"

Response	N	%
Yes	108	56.3
No	84	43.8
Total	192	100

As for the second question of this study, *"What are the significant barriers to the use of technology in education from teachers' perspectives?"* Table 9 provides the Mean and SD of participants' responses. Also, the mean of each item as well as the total mean of all items was compared with the assumed mean (2) through using one sample t-test to show the level of significance to each barrier to the use of technology in education individually and as a whole. Table 10 shows that the total mean of all items was (M=2.3433) which was higher than the assumed mean (2), it was significant (p<0.05), and t-test value was (t=11.889). Thus, the mean scores of most items (about 17 items) ranged from (M=2.7865) to (M=2.1302) which were higher than the assumed mean (2); they were significant (p<0.05), and t-test values ranging from (t=20.449) to (t=2.172).

On the other hand, the mean scores of the other items (6 items) ranged from (M=2.1094) to (M=1.6927) which were insignificantly higher (such as item 13) or lower than the assumed mean (2) at the level of significance (p<0.05) and t-test values ranging from (t=1.832) to (t=-5.030-). As viewed by the study participants, these barriers were not significant, so they have little effect on the surveyed female teachers' use of technology. These insignificant barriers were related to "fear of confidentiality of data and information hacking", "lack of knowledge to use educational technology", "commitment to traditional education instead of technological one", "feeling to waste time in using educational technology", "difficulty in controlling students during using educational technology", and "lack of skills in employing technology in education".

Table 9:

Level of the study participants' responses to the identified barriers to the use of technology in education from their perspectives

Variables of common barriers to the use of technology in education	N	Mean	SD	t	Sig. (2-tailed)
1. I find it difficult to produce educational technology.	192	2.1302	.83052	2.172	.031*
2. I have difficulty of controlling students while using educational technology.	192	1.7448	.82021	-4.311	.000**

3. I have a lack of knowledge of how to use modern educational technology effectively.	192	1.9010	.85345	-1.607	.110
4. I have poor skills in employing technology in education.	192	1.6927	.84652	-5.030	.000***
5. I feel that using educational technology is a waste of time in the classroom.	192	1.7760	.80369	-3.861	.000***
6. I prefer traditional education to technological education.	192	1.8333	.81436	-2.836	.005*
7. There is weakness in supervisors' guidance on the use and production of educational technology.	192	2.2969	.80599	5.104	.000***
8. There is a lack of participation of teachers with supervisors in developing curricula and educational technology appropriate for students.	192	2.3698	.74054	6.919	.000***
9. There is a lack of educational technology training courses that are appropriate for the school curriculum and students.	192	2.4219	.78209	7.474	.000***
10. There is a lack of material or moral incentives when the teacher uses educational technology in the classroom.	192	2.7396	.56503	18.137	.000***
11. The class time is short	192	2.1927	.88581	3.014	.003**
12. Difficulty in understanding the foreign language used in technological software and hardware.	192	2.3542	.79894	6.142	.000***
13. Educational technology threatens the confidentiality of data and information through hacking.	192	2.1094	.82723	1.832	.068
14. Lack of technological means that suits students' levels.	192	2.3646	.78092	6.469	.000***
15. Lack of availability of Internet-supported technology in the classroom.	192	2.7292	.59631	16.944	.000***
16. Lack of classrooms appropriate to use modern educational technology.	192	2.7188	.59144	16.839	.000***
17. Inappropriate classrooms for the use of educational technology.	192	2.6823	.63748	14.830	.000***
18. Difficulty in moving some technological devices to the classrooms.	192	2.7188	.59144	16.839	.000***
19. Unavailability of update and development to hardware, equipment and software that keep pace with the times in the field of education.	192	2.5938	.69521	11.834	.000***
20. Lack of interest in making maintenance to hardware, equipment, networks and readymade software by the school administration.	192	2.5365	.70801	10.499	.000***
21. I occasionally encounter hardware, equipment, network, and readymade software malfunctions when teaching.	192	2.6823	.65370	14.462	.000***
22. Lack of technological means inside the school so that it is not commensurate with the number of students who use them.	192	2.7865	.53292	20.449	.000***
23. The scarcity of technological means associated with the lessons of the school curriculum.	192	2.5208	.70122	10.292	.000***
Total	192	2.3433	.40012	11.889	.000***

Note. * *p<0.05, ** p<0.005, *** p<0.001*

To analyze the answers to the third question of this study, *"What are the proposals to address these significant barriers to the use of technology in education as seen from the point of view of teachers?"* Table 10 illustrates the participants' answers to the open-ended question. These responses to address significant barriers by the participants' perspectives were analyzed and categorized according to existing or emerging themes that were mentioned frequently by several of the study participants. Table 10 shows that there were five significant suggestions to address the barriers to the use of technology in education reported by the surveyed female teachers. 75 of the surveyed female teachers with 39.1% out of the total number 192 suggested "Providing hardware and Internet network in the classrooms" to address the significant barriers. In the second item, 52 female teachers with 27.1% of the total number 192 suggested "Intensification of training courses for female teachers in the use of technology" to address the significant barriers to the use of technology in education. In the third item, 52 female teachers with 27.1% of the total number 192 suggested "Providing a suitable school environment for the use of technological means" to address the significant barriers to the use of technology in education. In the fourth item, 23 female teachers with 12% of the total number 192 suggested "The need to hold training courses to develop learners' skills in the use of technology" to address the significant barriers to the use of technology in education. In the last item, 16 female teachers with 8.3% out of the total number 192 suggested "Interest in the maintenance and development of hardware, equipment, software and networks periodically" to address the significant barriers to the use of technology in education.

Table 10:

Participants' responses to "What are your suggestions to address the barriers and challenges of using technology in education in schools, whether related to the nature of the content - the teacher - the learner - the technical equipment of the learning environment?"

Suggestions	N	%
1- Providing hardware and Internet network in the classrooms.	75	39.1
2- Intensification of training courses for female teachers in the use of technology.	52	27.1
3- Providing a suitable school environment for the use of technological means.	52	27.1
4- The need to hold training courses to develop learners' skills in the use of technology.	23	12
5- Interest in the maintenance and development of hardware, equipment, software and networks periodically.	16	8.3

5. Discussions:

In this section, the results of the three questions of the study will be discussed in detail. First, to begin discussing and explaining the first question result as follows: as shown in Table 8, 108 of the participants answered "Yes" with 56.3% of the total number of the participants 192 while the other 84 participants estimated 43.8% answered "No" to the question *"Do you face barriers to the use of technology in teaching?"*. The result indicates that over half of the surveyed female teachers face barriers to the use of technology in education for some reasons that will be revealed later in the second question of this study. Here, the existence of barriers was confirmed not only in this study but also in findings of previous studies.

The second question results of this study as in Table 9 showed that it has become evident that these barriers to the use of technology in education as perceived by the surveyed female teachers were significant and affecting their use of technology in teaching. According to highest mean scores to the lowest scores respectively, these significant barriers were related to "lack of technological means commensurate with students' numbers", "lack of material and moral incentives to teachers", "lack of Internet-supported technology", "difficulty in moving technological devices to classrooms", "lack of classrooms and inappropriate ones to use educational technology", "hardware, network and software malfunctions", "lack of maintenance", "unavailability of updating and developing hardware, network and software", "the scarcity of technology-based curriculum", "lack of training courses", "lack of participation of teachers with supervisors regarding developing curriculum and educational technology", "lack of technology matching students' levels", "difficulty in the foreign language programmed in software and hardware", "supervisors' poor guidance on the use and production of educational technology", "class time shortness", and "difficulty of educational technology production". That is, the surveyed female teachers encountered barriers and difficulties that prevent or limit their use of technology in classrooms. The reasons consisted of insufficient computers for their students as well as the unavailable Internet network connection to these computers, getting few incentives and training courses to use these modern technology in teaching. In addition to that, there were insufficient and inappropriate classrooms to use technology when teaching, and some of these technological devices could hardly be moved to other classrooms. Sometimes the technological means could malfunction during teaching and there was no maintenance made to these technological devices and programs, and there was no update and development to these technologies, so the teachers might have resorted to the traditional method in teaching instead of modern technological use. When the curriculum is rarely supported by technology, technology will be far from the pedagogical goals, so there will be a gap between curriculum and the technology used. In fact, the curriculum should be developed with consultation of teachers, not only by the supervisors, where the majority lack technological skills and knowledge; thus technology should always be taken into consideration. Also, these technological means should be in harmony with the students' levels so that they can adapt themselves to these technologies. Sometimes teachers face difficulty in understanding the English language or other languages, especially when these foreign languages are used in the programs of the technological devices they use in teaching. One important factor is time, which is crucial in teaching in classes especially with the use of technological means.

On the other hand, some barriers had little effect on the surveyed female teachers' use of technology in teaching. These insignificant barriers were related to "fear of confidentiality of data and information hacking", "lack of knowledge to use educational technology", "commitment to traditional education instead of technological one", "feeling to waste time in using educational technology", "difficulty in controlling students during using educational technology", and "lack of skills in employing technology in education". That is, the surveyed female teachers have enough knowledge and skills to use the technology in their classrooms with somewhat high security from hacking, preferring the technological education and believing in the benefits of using technology in education for themselves and their students to make learning better and more interesting.

Concerning the barriers to the use of technology in education, this study confirmed the existence of barriers, regardless of differences in classified categories or wording of statements as in some studies. Most previous studies revealed the existence of barriers in the use of technology in education, but they differed in their categories and the level of significant effect to barriers. At the level of the identifiable barriers, the results of this study agreed with Nouri and Mahdi (2019) in some significant and high barriers such as "increasing number of students in classroom limit the use of modern technology", "lack of computer devices", "difficulty of providing technical support", "lack of training", but it differed in the insignificant and low barrier "lack of technologically skilled teachers".

Another study of Issa and Saleh (2019) was consistent with this study regarding the significant barriers such as "lack of equipment and infrastructure", "lack of training courses in

the use of modern technology in teaching", "lack of incentives", "inconvenient halls for the use of technology", "difficulty in moving some devices and equipment to other halls", "short class time", "lack of technology that matches the student's cognitive levels", and "lack of participation of teachers with supervisors in developing technology-based curriculum".

A study of Abdulhaleem and Abdulaziz (2018) agreed with this study in some significant and high barriers such as "lack of training teachers and providing them with incentives to use technology in education", "malfunctions in computers, programs and networks and lack of making maintenance frequently", but it differed in the insignificant and low barriers such as "teacher's refusal to use the modern technology in education and his commitment to the traditional methods", "his passive attitude to the use of technology in classroom and his belief of insignificance of using it", and "lack of security to networks, software programs and computers".

This study agreed with Al-Zuwaini, Mussa and Hameed (2020) in some significantly identified barriers such as "insufficient computers in schools", "inappropriate classrooms to e-learning", "lack of training for teachers to use computer in teaching" and "lack of programs designed to teach the Arabic language".

Al-Hawamidah (2011) in his study results showed some significant barriers which were similar with this study's results such as "lack of equipment and computers with the Internet connection", and "insufficient facilities", but the difference was in the insignificant barrier "teachers who are technologically skilled".

According to the study results of Al-Zou'bi (2019), some significant barriers similar to this study results were "lack of time in classroom", "insufficient classrooms to the use of technology", "the crowdedness of the students in classroom", "lack of training teachers in the use of technology".

This study was in agreement with Chambers (2019) in the significant barrier such as "technology devices are old, outdated, or incompatible", and it also agreed with Singhavi and Basargekar (2019) in some significant barriers such as the schools' lack of internet-supported computers, insufficient internet connection, lack of educational programs, lack of appropriate educational models, and lack of sufficient time. However, it differed in non-important barriers such as lack of priority of ICT by school management and parents, negative attitude of teachers, uselessness of ICT, mistrust in the use of ICT. It also differed with Doshmanziari and Mostafavi (2017) in the insignificant barriers "computer science weakness in teachers" and " teacher's resistance to the changes".

The answer to the third question of this study (Table 10) showed that there were five significant suggestions to address the barriers to the use of technology in education reported by the surveyed female teachers. 39.1% out of 192 female teachers suggested "Providing hardware and Internet network in the classrooms" to address the significant barriers. The reasons for that may be lack of hardware devices such as computers and Internet network connected with these computers. Also, there may be no sufficient funds to acquire more computers and the Internet. Another reason can be that the school administration may have no desire to allow students to use the Internet network since they may be distracted during class time or use it for non-educational purposes. This suggestion was in agreement with the recommendations of some previous studies (e.g., Issa & Saleh, 2019; Abdulhaleem & Abdulaziz, 2018; Al-Hawamidah, 2011; Al-Zou'bi, 2019; Singhavi & Basargekar, 2019).

In the second item, 52 female teachers out of 192 suggested "Intensification of training courses for female teachers in the use of technology" to address the significant barriers to the use of technology in education. The reasons for that may be lack of training courses for female teachers. Also, the training courses may be held rarely or may not be in harmony with the female teachers' specializations. This suggestion agreed with the recommendations of some previous studies (e.g., Nouri & Mahdi, 2019; Issa & Saleh, 2019; Abdulhaleem & Abdulaziz, 2018; Al-Zuwaini, Mussa & Hameed, 2020; Al-Hawamidah, 2011; Al-Zou'bi, 2019; Singhavi & Basargekar, 2019).

In the third item, 27.1% of the participants suggested "Providing a suitable school environment for the use of technological means" to address the significant barriers to the use of technology in education. The reason for that may be that the school infrastructure may not suit technological equipment and devices. Also,

some school buildings and facilities may be old. This suggestion agreed with the recommendations in the study of Abdulhaleem and Abdulaziz (2018).

In the fourth item, 23 female teachers (12%) suggested "The need to hold training courses to develop learners' skills in the use of technology" to address the significant barriers to the use of technology in education. The reason for that may be that most students perhaps lack technological skills when using technology in their learning. Also, the students may not be trained to use technology and educational technology programs. This suggestion agreed with the recommendations in the study of Al-Hawamidah (2011).

In the last item, 16 female teachers (8.3%) suggested "Interest in the maintenance and development of hardware, equipment, software and networks periodically" to address the significant barriers to the use of technology in education. The reasons for that may be that there may be malfunctions in the technological means such as computers, programs and networks and other devices or these technological means may be old-fashioned and outdated. Also, there may be no technical specialists in the girls' schools. Another reason may be lack of budget allocated for development of these technological means.

6. Conclusion:

Drastic changes have been happening to the field of education since the invention of technology in this era. As a consequence, technology integration in education has provided many benefits for both the teacher and the learner. However, some barriers have been found to limit or prevent teachers from using technology in their profession of teaching. For the purpose of overcoming these barriers, the study aimed at investigating and identifying the significant barriers in the use of technology in education and then addressing them from the teachers' perspectives.

The results found that 17 significant barriers were the following: lack of technological means commensurate with students' numbers; lack of material and moral incentives to teachers; lack of Internet-supported technology; difficulty in moving technological devices to classrooms; lack of classrooms and inadequate ones to use educational technology; hardware, network and software malfunctions; lack of maintenance; unavailability of updating and developing hardware, network and software; the scarcity of technology-based curriculum; lack of training courses; lack of participation of supervised teachers regarding developing curriculum and educational technology; lack of technology matching students' levels; difficulty in the foreign language programmed in software and hardware; supervisors' poor guidance on the use and production of educational technology; short class times; and difficulty of educational technology production. The insignificant barriers were six, including: fear of confidentiality of data and information hacking; lack of knowledge to use educational technology; commitment to traditional education instead of technological one; feeling of waste time in using educational technology; difficulty in controlling students during the use of educational technology; and lack of skills in deploying technology in education.

To address these significant barriers, some recommendations were suggested as follows:

- Providing hardware and Internet network in the classrooms.

- Intensification of training courses for female teachers in the use of technology.

- Providing a suitable school environment for the use of technological means.

- The need to hold training courses to develop learners' skills in the use of technology.

- Interest in the maintenance and development of hardware, equipment, software and networks periodically.

References:

[1] Abdulhaleem, B. M. & Abdulaziz, B. A. (2018). Challenges and difficulties facing the application of intelligent learning technology in primary schools algeria from the teachers' point of view (Mobile learning model). *Journal of Social Sciences and Humanities*, *7*(14), 384-409.

[2] Al-Hawamidah, M. F. (2011). Barriers to using e-learning from the viewpoint of faculty members at al-balqa applied university. *Journal of Damascus University*, *27*(1+2), 803-831.

[3] Al-Khawaldeh, N. I. (2014). Barriers to utilizing ICT in education in jordan. *International Journal on E-learning*, *13*(2), 127-155.

[4] Al-Shraideh, M. A. (2017). Obstacles to using educational technologies at Prince sattam bin abdulaziz university. *Educational Sciences: Cairo University-Faculty of Graduate Studies of Education*, *25*(3), 367-398. Retrieved from http://search.mandumah.com/Record/883246

[5] Al-Shuaibi, A. (2017). Technology as an important role in the implementation of saudi arabia's vision 2030. *International Journal of Business, Humanities and Technology*, *7*(2), 52-62.

[6] Al-Zou'bi, H. (2019). The problems of using technology in education encountering teachers of the first three grades. *The Arab Journal of Science and Technology Education*, (8), 107-125. Retrieved from http://search.mandumah.com/Record/958795

[7] Al-Zuwaini, I., Mussa, D., & Hamid, R. H. (2020). E-learning application constraints from the view point of arabic language teachers and their parameters. *Al-Bourk Academy Journal of Humanities and Social Sciences*, *1*(2), 94-124.

[8] Bingimlas, K. A. (2009). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *Eurasia Journal of Mathematics, Science & Technology Education*, *5*(3), 235-245. https://doi.org/10.12973/ejmste/75275

[9] Chambers, S. E. (2019). *Barriers Affecting Teacher Integration of Technology in 1:1 Classrooms*. [Unpublished Doctoral dissertation]. Baker University.

[10] Doshmanziari, E. & Mostafavi, A. (2017). Barriers to use of educational technology in the learning process of primary school students in district 13 in tehran. *International Education Studies*, *10*(2), 44-53. https://doi.org/10.5539/ies.v10n2p44

[11] European Schoolnet. (2006). *The ICT impact report: A review of studies of ICT impact on schools in Europe*. European Communities.

[12] Francom, G. M. (2016). Barriers to technology use in large and small school districts. *Journal of Information Technology Education: Research*, *15*, 577-591. Retrieved from http://www.informingscience.org/Publications/3596

[13] Golam. K., (2008). *Obstacles to e-learning in Saudi Universities* [Unpublished Master thesis]. King Abdulaziz University.

[14] Hew, K. F. & Brush, T. (2007). Integrating technology into k-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, *55*(3), 223–252.

[15] Inan, F. A. & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development*, *58*(2), 137–154.

[16] Issa, R. I. & Saleh, J. S. (2019). The difficult application of modern education technology from the point view of the members of a teaching staff. *Journal of University of Babylon, Pure and Applied Sciences*, *27*(1), 206-227.

[17] Joseph, J. (2012). The barriers of using education technology for optimizing the educational experience of learners. *Procedia - Social and Behavioral Sciences 64*, 427-436. Available online at www.sciencedirect.com

[18] Kopcha, T. J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers & Education*, *59*(4), 1109–1121.

[19] Kozma, R. B. (2003). Technology and classroom practices: An international study. *Journal of Research on Technology in Education*, *36*(1), 1-14. https://doi.org/10.1080/15391523.2003.10782399

[20] Nouri, Z. H. & Mahdi, D. S. (2019). Barriers of using modern technology in secondary education from the teachers' point of view. *The Arabic Journal of Educational and Psychological Sciences*, (8). 127-143.

[21] Pelgrum, W. J. (2001). Obstacles to the integration of ICT in education: results from a worldwide educational assessment. *Computers and Education*, *37*(2). 163-178. https://doi.org/10.1016/S0360-1315(01)00045-8

[22] Peramunugamage, A. & Halwatura, R. U. (2013). Current trends and patterns of technology use in higher education. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2934764
[23] Pine-Thomas, J. A. (2017). Educator's technology integration barriers and student technology preparedness as 21st century professionals [Unpublished Doctoral Dissertation]. Walden University.
[24] Reinhart, J. M., Thomas, E., & Toriskie, J. M. (2011). K-12 teachers: Technology use and the second level digital divide. *Journal of Instructional Psychology, 38*(3), 181–193.
[25] Riasati, M. J., Allahyar, N., & Tan, K. (2012). Technology in language education: Benefits and barriers. *Journal of Education and Practice*, *3*(5), 25-30.
[26] Ritzhaupt, A. D., Dawson, K., & Cavanaugh, C. (2012). An investigation of factors influencing student use of technology in k-12 classrooms using path analysis. *Journal of Educational Computing Research, 46*(3), 229–254.
[27] Singhavi, C. & Basargekar, P. (2019). Barriers perceived by teachers for use of information and communication technology (ICT) in the classroom in maharashtra, india. *International Journal of Education and Development using Information and Communication Technology*, *15*(2), 62-78.
[28] Zaytoon, H. H. (2005). *E-learning concept, issues, planning, application and evaluation*. Al-Dar Al-Awaltiyah for Education.