Introduction. The impact of the Corona pandemic in various countries of the world is still present on most aspects of life, albeit to varying degrees. The higher education sector, including universities and higher education institutions, was not immune from this, there are universities that have faced the challenge of the pandemic by developing innovative ways and solutions to continue academic and research activity in them; such as e-learning, virtual scientific conferences, and working in remote research groups. This study aimed to reveal the e-learning challenges facing faculty members in Jordanian Public Universities during Coronavirus Pandemic from their perspectives.

Methods. The study involved 226 faculty members chosen randomly from four Jordanian public universities for the second semester of the academic year 2019/2020. To study the e-learning challenges facing faculty members in universities, a questionnaire was developed and it included sixty-four items divided into seven domains as follows: (the challenges of planning and designing for e-learning), (technical challenges to the use of e-learning techniques), (challenges of e-learning management), (the challenges of scientific research via the Internet), (financial and administrative challenges for e-learning university), (general professional challenges for a faculty member in the domain of e-learning), and (the challenges of evaluating e-learning).

Research results. It was revealed that the descending order of challenges as follows: scientific research (mean (M) = 2.78; standard deviation (s) =1.198), challenges of e-learning techniques (M = 2.72; s = 1.120), financial and administrative challenges (M = 2.38; s = 0.841), professional challenges (M = 2.37; s = 0.717), evaluation (M = 2.27; s = 0.082), management (M = 2.27; s = 0.882), planning and design of e-learning (M = 2.26; s = 0.788. The results showed a high percentage of the faculty members attended training to deal with technology.

No statistically significant differences were found in challenges due to gender (M = 2.33, s = 0.684), academic rank, and experience (M = 2.47, s = 0.693). The results showed that there were differences attributed to the type of college and in favor of the humanities colleges, and differences attributed to the university, and in favor of Tafila Technical University.

Conclusion. The coronavirus crisis has cast a shadow over the education sector. As it prompted universities and educational institutions to close their doors to reduce the chances of its spread. This aroused great concern among those involved in this sector. All this prompted educational institutions to switch to e-learning, as an alternative that has long been talked about and controversy over the necessity of integrating it into the educational process. However, faculty members in universities faced several challenges in the use of e-learning, and the researchers studied these challenges facing them from their point of view and made some recommendations.

Keywords: challenges, e-learning, coronavirus pandemic, faculty members, public universities

For Reference:
Masri, A. Al, & Rimawi, S. (2022). Challenges of applying e-learning facing faculty members in public universities during COVID-19. Perspektivy nauki i obrazowania – Perspectives of Science and Education, 56 (2), 534-560. doi: 10.32744/pse.2022.2.32
In recent years, the world has witnessed successive and rapid technological, technical and informational developments, and openness to different cultures; This makes it imperative for those in charge of educational institutions to coexist with all global changes, to keep pace with those changes, developments and challenges; And in light of global trends and education development policies that took various forms, including e-learning, distance learning and other methods of development [1].

As a result of the conditions that the entire world is currently experiencing, represented by the spread of the Corona virus, which has had a severe impact on the educational process as a result of this pandemic; Educational institutions suddenly found themselves forced to switch to distance education to ensure the continuity of the teaching and learning process, and to use the Internet, smartphones and computers to communicate remotely with students [2]. Therefore, various countries, including Jordan, have adopted; e-learning as a means for students to continue receiving their education in order to guarantee their scientific future, as plans were made to preserve the sustainability of the educational process and reduce the effects of the Corona crisis by adopting the distance education system, so that all students could complete their studies without being affected by the consequences of the Corona epidemic, and the adoption of a mechanism that guarantees the rights of the students and the difficult economic conditions that universities are going through.

The new Corona virus may be the new beginning of the possibilities of distance education for the higher education sector in Jordan. The need for online education options can no longer be dismissed, and perhaps distance education will become a recognized alternative to face-to-face education. It is less capital intensive and fits with the need to improve students' digital competence. E-learning may revolutionize higher education because today's students generally have a higher ability to adapt to technology and electronic portals, and therefore the transition to education will be online, this may become the norm from now on. Educational institutions that are not adapted to digital teaching may become uncompetitive and operationally unsustainable [3].

Sawalhieh [4] indicates that e-learning is a type of learning that has been talked about for a long time and the controversy over the necessity of integrating it into the educational process. Before the Corona pandemic, however, it became an alternative and an urgent necessity for the continuation of education in conditions that impose physical distancing, as it came as a result of technological developments, especially after the educational process was directly affected by the development of artificial intelligence technology, and the information technology revolution that stormed the classroom and became an integral part of it. E-learning and in light of the great technological development and with the spread of modern means of communication such as a computer, the Internet, and multiple media, such as: audio, image, and video, are means that have allowed a large number of learners to receive education with ease, and with minimal time and effort, which contribute in one way or another to the success of the educational process.

Basilaia, G., & Kvavadze, D. [5] believes that e-learning is an organized process that aims to achieve educational outcomes using technological means that provide sound, image, films and interaction between the learner, content and educational activities at the appropriate time and time. One of the most important common terms used to express and describe
it is distance education and computerized e-learning, in the form of interactive meetings via the Internet, in which the student can interact with teachers, and receive tasks and duties from them at the same time [6]. In addition, e-learning will be the dominant style of education in the future. The current generation is characterized by its attachment to smart phone devices and the use of various applications. Therefore, the integration of technology into the educational process has become a global trend, and interaction with educational activities through mobile devices has become a motivating factor for learning instead of being satisfied with traditional study [2].

The past few years have witnessed a great leap in technological innovations related to education, from computer-based education, to the use of the Internet in the educational process, and from there to e-learning, which is one of the methods of distance education [7]. The progress in the field of information technology has led to an abundance of information in all its fields, and thus the distance between information and the teacher has vanished. Which required an urgent need to develop methods and skills of learning and teaching to reach the learner to acquire information on their own. Where the educational material is presented to the learner in the shortest time and with the least effort, by relying on the means of technology and what has become of it in terms of advanced means. Where the e-learning system relies mainly on the existence of a digital electronic environment that reviews the courses for students through electronic networks, and provides all the guidance that the learner needs [8].

This study attempts to identify the e-learning challenges facing faculty members in Jordanian public universities. The importance of this study is confirmed in that it will provide feedback to decision-makers in Jordanian public universities to reveal the e-learning challenges facing faculty members in Jordanian public universities, as diagnosing e-learning challenges would help faculty members and administrative decision-makers in universities to face and address these challenges for the successful implementation of the e-learning system. As one of the most prominent fruits of scientific and technological progress witnessed in the field of education is the emergence of the e-learning pattern, which has imposed a new educational and educational reality on educational institutions, whether at the level of public education or higher education to reach the knowledge economy. A national strategy for e-learning must be adopted that involves the exploitation of modern technologies as a basic tool in the Jordanian education system at all levels. However, such a strategic choice requires a radical change in the environment and methods of education and requires tremendous efforts and resources, which constitutes a major challenge for a developing country with limited resources and wealth. The initial investment to establish a knowledge network and equip schools and universities, in addition to the cost of operation, maintenance, renewal and the cost of producing the necessary software constitutes a real challenge, especially for a country with limited resources and natural resources such as Jordan, and based on the researcher’s experience through her observation of her fellow faculty members in universities, and the majority of them adhere to traditional teaching methods, and their reluctance to use e-learning for many reasons. When the researcher returned to previous studies, she only finds any limited studies that dealt with the e-learning challenges facing faculty members in Jordanian public universities.

The study seeks to answer the following questions:

1. What are the e-learning challenges facing faculty members in Jordanian public universities?
2. What courses have the faculty members attended in Jordanian public universities in the field of e-learning?

3. Are there statistically significant differences between the views of faculty members in Jordanian public universities regarding e-learning challenges due to gender, experience, college and university?

Theoretical Background

1. The concept of Distance Education

Distance education and all types of e-learning have developed along with technological, educational, and social education. Previously, distance education models have acquired multiple aspects and become more and more complex, especially in the times of digital acceleration we live in [9].

Pedagogy and technology play a crucial role in distance education and e-learning, as the distance is social psychological, and cultural-historical more than geographical [10]. Overcoming distance, through intermediate technological practices established in pedagogical principles, has led to the development of a wide range of educational possibilities.

In line with Bates [11], it is critical to distinguish between the different standards for online distance education, e-learning, and, within the scope of e-learning, the distinction between distance education and blended learning, and e-learning. Online distance learning models, is characterized by saving time and space, ensure the self-learning skills, while blended learning models can range from digitizing personal learning contexts to designing new courses that promote flexible learning, and recombining personal and online learning styles.

Hybrid and HyFlex models are two types of blended learning. The HyFlex models provide students with the opportunity to combine different learning models, according to their special learning styles and their needs [11]. For He et al. [12] the most significant challenge to HyFlex design and implementation is ensuring that students can participate online (and encourage them to participate) in interactive learning experiences that lead to significant learning outcomes. For Beatty [13], HyFlex courses feature a mix of online and face-to-face learning elements, that means students can choose to complete any part of the course either face to face or online.

Herman et al. [14] in their feasibility study, they found very little evidence of programs that were able to support students' choice in blended learning flexibility, something that was considered as a possible benefit of blended learning.

2. Distance education during the Coronavirus

Coronavirus pandemic changed the educational system worldwide, all educational institutions in all countries moved to distance education in all its types. Many researchers conducted studies relating the Coronavirus Pandemic such as Alraqab [9] for example, his study aimed to reveal the difficulties of distance education the spread of the Corona virus (19-Covid) from the point of view of teachers and principals of Khan Yunis schools in the Gaza Strip in Palestine. To achieve the objectives of the study, the descriptive approach was used, and the study sample consisted of 51 principals and 164 teachers working in schools in Khan Yunis governorate during the pandemic, who were forced to move to distance education, apply and employ it in order to maintain the continuity of the educational process in the governorate. A questionnaire was prepared to achieve the objectives of the study and
it was applied to the study sample. The results of the study showed that the difficulties facing distance education in light of the spread of the Corona virus (COVID-19) from the point of view of teachers and school principals in Khan Yunis Governorate in the Gaza Strip came to a high degree in all axes of the study, which included principals, teachers and students, and the results showed great agreement between principals and teachers' views on assessment of difficulties. Abu Shkhedem et al. [10] also aimed to reveal the effectiveness of e-learning in light of the spread of the Corona virus from the point of view of teachers at Kadoorie University, to achieve the objectives of the study, the descriptive analytical method was used, the study sample consisted of (50) faculty members at Kadoorie University who taught during the period of the spread of the Corona virus through the e-learning system, the necessary data were collected using a questionnaire with a reliability coefficient of (804.0) and it was applied to the study sample. The results of the study revealed that the study sample’s evaluation of the effectiveness of e-learning in light of the spread of the Corona virus from their point of view was average, their evaluation of the field of e-learning continuity, the field of obstacles to the use of e-learning, the field of interaction of faculty members with e-learning, and the field of students' interaction in the use of e-learning was moderate. The researchers recommended holding training courses in the field of e-learning for each of the teachers and students and help to get rid of all obstacles that prevent benefiting from the e-learning system followed, and the need to combine face-to-face education and e-education in higher education institutions in the future. Marques et al. [11] conducted a theoretical study aimed at examining the poor access of socially isolated students to distance education in light of the Corona pandemic (COVID-19) in Portugal, the study focused on the students' experience of distance education in the context of commitment to social isolation, and the study discussed distance education as a realistic response to combating social isolation, while trying not to miss any classroom. The study sheds light on the student's requirements of information and communication technology, especially students who do not have all the materials necessary to access the contents that are taught remotely. The study also dealt with the difficulties that teachers face during the Corona pandemic (COVID-19) in Portugal in particular, and in the world in general. The study showed a similarity in the difficulties, which are generally embodied in: the unequal access of all students with regard to access to technology, and on the other hand, the difficulty of accessing students who live in areas where the Internet is not available, or who do not have modern equipment, and teachers, according to the study, faced a problem of poor training; Because of the sudden transition to distance education, as well as the lack of a suitable place to work, the lessons via the Internet constituted a greater burden on teachers in terms of time and material cost. The study recommended the need to work to meet the needs of socially isolated students, whether by providing Internet connection, providing appropriate equipment and programs, and presenting content and information in an interesting manner, the study also recommended increasing interest in these students; This provides an opportunity to integrate knowledge, and not make these students feel left out. Students can also be involved in working groups, and make them part of the integration. The study recommended the need to work to improve the quality, students can also be involved in working groups, making them part of the integration. The study recommended the need to work to improve the quality of education, invest in training by teachers, and plan and prepare using access to virtual learning environments such as: Zoom applications, Classroom Google and Ms Teams. As for Darica & Dina [12], the Commonwealth Council for Education Management, they conducted a study aimed at clarifying the role of skilled leadership in
higher education institutions in the transition to distance education in the era of Corona, and the study showed that skilled leadership has the primary role in leading this transformation. As well as the ability to move courses entirely online, planning and financial management, designing and delivering lessons, supporting students and ensuring their participation. This requires that the leader possess the personal skills that are able to influence team members; To achieve the desired goals, it also requires knowledge of what companies produce of modern technological tools, or advanced programs that can be relied upon. As a result, the study showed that the transition to distance education via the Internet in light of the Corona pandemic (COVID-19) needs skilled leadership, and it seems that the biggest advantage of the crisis is that it has promoted the development and use of distance education. The study recommended that leaders build strong relationships with staff, faculty, students, and other stakeholders during the crisis. It also recommended that leaders monitor financial capacity, and manage it well to follow up on emergency changes; This is because the lack of financial aid may lead to the failure of the desired goal of distance education. The study recommended the need for appropriate professional development and training for faculty members and learners in online education, so that it contributes to facilitating the transition to distance education. While Rokopenko & Berezhna [13] conducted a study in Ukraine that showed that the outbreak of the new Corona virus (COVID-19) led to a change in the way students learn all over the world, and these changes led to an attempt to imagine whether education would change for the better or for the worse in the long run, Higher education institutions in Ukrainian universities - like many institutions of higher education around the world – quickly turned to distance learning, through the Internet, computers, social media, and various applications available such as: Google-class, Messenger, Telegram, Viber, Zoom Skype, Model and others. The results of a questionnaire among Ukrainian university students, identifying the difficulties and benefits resulting from distance learning, and as a result, the quarantine during the Corona Virus (COVID-19) pandemic created new challenges and opportunities for distance learning, from the point of view of both students and teachers, as the pandemic prompted students to attempt self-education, it also prompted teachers to work on mastering the use of distance education tools. the study recommended working on analyzing the organizational work of departments and sub-sections, and on training students. As well as psychological and medical care for students. Galeoto et al. [14] showed in a study conducted at Sapienza University in Rome-Italy that most governments in the world closed educational institutions; in an attempt to prevent an outbreak of the disease, the study aimed to describe and share the methods used to deliver lessons to students in the Health Rehabilitation Program at Sapienza University in Rome during the COVID-19 pandemic. According to the study, distance education was implemented in several stages, by activating participation between teachers and students as an initial stage, using the Google Classroom application, and then publishing students on social networking sites for their teachers, and providing teaching using Google Meet and Google Classroom, and many students have successfully enrolled to online lessons. The study stated that by 11/3/2020 all lessons were prepared and placed on the Internet and students were given access codes to them, and that many students attended the lessons successfully, and the students explained that they receive useful feedback, and thus; The results were positive, effective, and worthy of sharing in other disciplines. The authors of this study also wish to share strategies used to address the challenges that threaten the educational process around the world; Because this participation is of paramount importance to achieve better levels of education. Terenko & Ogienko [15] study included a quantitative and qualitative
research method, where a group of students who received education in quarantine conditions in Rome were involved, aimed at defining educational curricula online in light of the Corona (COVID-19) pandemic, distance education has been implemented in universities, using platforms such as Moodle and Prometheus, which are available online, and the study showed that distance education was transitioned during the Corona pandemic; to reduce the spread of the virus. The results of the study indicated the flexibility of online education, and indicated that it was necessary to provide educational and informational support for students and teachers. The study showed some of the educational difficulties that students and teachers face in teaching online, from the unstable access to the Internet, poor self-study skills, lack of direct communication, in addition to the problem of poor eyesight among some students, teachers expressed concern about the lack of online curriculum materials, the lack of tools, training to manage distance education, and the appropriate level of technology for teachers. Nevertheless; The study showed that most of the students who received lectures and courses online had a positive opinion, and teachers and students saw that distance education is the only solution in quarantine conditions. The researcher used an online questionnaire to achieve the aim of the study.

Based on the foregoing, there is a need to evaluate this experience by faculty members by identifying the reality of e-learning and the challenges they face in its application in Jordanian universities in light of the Corona pandemic.

**Research Method**

1. **The Population of the Study**
   It includes faculty members in Jordanian public universities.

2. **The Study Sample**
   The study sample consisted of 226 faculty members chosen randomly from four Jordanian public universities for the second semester of the academic year 2019/2020. Table (1) shows the distribution of sample members by gender, experience, academic rank, college and university.

**Table 1**

| Variable       | Levels                        | Repetition | Percentage |
|----------------|-------------------------------|------------|------------|
| Gender         | Male                          | 160        | 70.8%      |
|                | Female                        | 66         | 29.2%      |
| Experience     | 1-5 years                     | 112        | 49.6%      |
|                | 6-10 years                    | 78         | 34.5%      |
|                | 11 years or more              | 36         | 15.9%      |
| College        | Scientific                    | 110        | 48.7%      |
|                | Humanity                      | 116        | 51.3%      |
| The University | Al Balqa Applied University   | 88         | 38.9%      |
|                | Mutah University              | 32         | 14.2%      |
|                | Hussein bin Talal University  | 60         | 26.5%      |
|                | Tafila Technical University   | 46         | 20.4%      |
3. The Study Tool

To achieve the objectives of the study, the researchers developed the study tool, which consisted of two parts. The first part of the respondents asked to fill in personal data such as: gender, experience, university, academic rank, type of college (scientific, humanitarian), and the courses attended by the respondent in the field of e-learning. As for the second part, it included sixty-four items divided into seven domains as follows: The first domain (the challenges of planning and designing for e-learning) and it consists of ten items. The second domain (technical challenges to the use of e-learning techniques) consists of sixteen items, and the third domain (challenges of e-learning management) consists of nine items, and the fourth domain (the challenges of scientific research via the Internet) consists of seven items, the fifth domain (financial and administrative challenges for e-learning university) consists of seven items, and the sixth domain (general professional challenges for a faculty member in the domain of e-learning) consists of seven items, and the seventh domain (the challenges of evaluating e-learning) and consists of eight items.

The five-point Likert scale was adopted according to the following gradation:

(Very high, high, medium, low, very low), where 5 marks were given for the category with a very high degree, 4 marks for the high category, 3 marks for the category with a medium degree, two marks for the category with a low degree, and one degree for the category with a very low degree.

3.1 The Validity and Reliability of the Tool

To ensure the validity of the tool, it was presented in its initial form to a group of arbitrators from among the faculty members with experience and expertise at Al al-Bayt University, Al Balqa Applied University, and Mutah University, they were asked to express their opinions on the extent to which each item belongs to the field to which it belongs, the integrity of the linguistic formulation, and the clarity of meaning. In light of the arbitrators' suggestions, the researchers deleted some items, and made modifications to some items until the tool appeared in its final form. The researchers considered the opinions of the arbitrators and their amendments an indication of sufficient validity for the purposes of the study. To ensure the reliability of the study tool, the reliability coefficient was calculated by the internal consistency method using Cronbach's alpha equation, and the reliability values for the challenge domains were as shown in Table No. (2) below.

| Domain                                      | N   | Homogeneity and reliability |
|---------------------------------------------|-----|-----------------------------|
| Planning and design challenges for e-learning | 1   | 0.7849                      |
| Technical challenges of using e-learning technologies | 2   | 0.9207                      |
| E-learning management challenges            | 3   | 0.8203                      |
| Online research challenges                  | 4   | 0.8676                      |
| University financial and administrative challenges for e-learning | 5   | 0.8368                      |
All previous stability values are acceptable for the purposes of this study.

4. Study variables

4.1 Independent variables
- Gender and has two categories: (male, female)
- Experience has three levels: (1-5 years, 6-10 years, 11 years and more).
- Academic rank and has three levels: (instructor + full-time lecturer, assistant professor, associate professor and above).
- The university has four universities: (Al Balqa Applied University, Mutah University, Hussein bin Talal University, and Tafila Technical University).
- The college has two levels: (scientific and humane).

4.2 Dependent variable
- The degree of e-learning challenges facing faculty members in Jordanian public universities in the seven fields of study mentioned.

5. Statistical Treatment
To answer the first question, the researchers used arithmetic means, standard deviations, and percentages. In order to answer the second question, which aims to reveal statistically significant differences at the significance level (α = 0.05) in the domains of e-learning challenges facing faculty members in Jordanian public universities due to gender, academic rank, experience, and university and college, the researchers used the analysis of variance, and (T) Test.

Presentation and discussion of the study results

Results related to the answer to the first question: What are the e-learning challenges facing faculty members in Jordanian public universities?
To answer this question, arithmetic means and standard deviations were calculated. Table 3 illustrates these challenges.

The challenges of e-learning as seen by the faculty members, arranged according to the arithmetic average, from highest to lowest

First Domain: Planning and Design Challenges for E-Learning
The ability to prepare the educational scenario for the electronic course

The ability to select Multimedia that uses audio, image, text and graphics from video clips, etc., which will appear in the lesson view.

The ability to use artistic design elements such as graphics, shapes, images and colors in proportion to the topic of the lesson.

The ability to use some ready-made design and authoring programs such as Photoshop, Flash, Front page, Author ware.

The ability to identify the teaching strategies necessary to achieve the objectives of the electronic course.

The ability to determine the educational objectives of the lessons and units of the electronic course.

The ability to use artistic design elements such as graphics, shapes, images and colors in proportion to the topic of the lesson.

The ability to determine the material and human requirements necessary to prepare the electronic course.

The ability to determine the educational objectives of the lessons and units of the electronic course.

The ability to determine the material and human requirements necessary to prepare the electronic course.

The ability to determine the educational objectives of the lessons and units of the electronic course.

The ability to determine the material and human requirements necessary to prepare the electronic course.

The ability to determine the educational objectives of the lessons and units of the electronic course.

The ability to determine the material and human requirements necessary to prepare the electronic course.

The table above for the first domain: the challenges of planning and designing for e-learning were to a small degree, with a mean of 2.26 and a standard deviation of 0.788.

**Second Domain: Technical Challenges of Using E-Learning Techniques**

| N  | Rank | Item                                                                 | Mean   | Standard deviation |
|----|------|----------------------------------------------------------------------|--------|--------------------|
| 16 | 1    | How to deal with the Desktop, files and programs, whether by saving, moving, deleting or modifying | 3.04   | 1.765              |
| 5  | 2    | Send and receive e-mail messages and circulate them to a group of users at the same time | 2.97   | 1.709              |
| 11 | 3    | Using the Scanner                                                   | 2.89   | 1.718              |
| 9  | 4    | Using Netscape, Explorer, etc. to browse the Internet               | 2.88   | 1.662              |
| 15 | 5    | How to deal with input and output units                             | 2.86   | 1.731              |
| 14 | 6    | Using Office software such as MS WORD and MS Excel spreadsheets     | 2.86   | 1.716              |
| 13 | 7    | Produce and use Power point presentations                          | 2.85   | 1.702              |
| 4  | 8    | Upload files to network and save them                              | 2.81   | 1.709              |
| 10 | 9    | Using the Data Show Projector                                      | 2.77   | 1.722              |
| 12 | 10   | Handling CDs, DVDs, Flash Memory                                    | 2.76   | 1.708              |
| 3  | 11   | Download files from the network and save them Download              | 2.73   | 1.758              |
| 2  | 13   | Ability to communicate through various electronic means             | 2.46   | 1.648              |
| 8  | 14   | Use of multimedia                                                   | 2.46   | 1.427              |
| 6  | 15   | Save or unpack files to and from the network                        | 2.37   | 1.453              |
| 7  | 16   | Overcome technical problems during use                              | 2.19   | 1.315              |

The table above shows for the second domain: the technical challenges of using e-learning techniques were of a medium degree, with a mean of 2.72 and a standard deviation of 1.120.

**Third Domain: Challenges of E-Learning Management**

| N  | Rank | Items                                                                 | Mean   | Standard deviation |
|----|------|----------------------------------------------------------------------|--------|--------------------|
| 4  | 1    | Commitment to applying the procedures of the scientific and academic secretariat | 2.47   | 1.576              |
| 5  | 2    | Verifying the extent to which students have mastered electronic and technical skills in e-learning before submitting e-courses | 2.36   | 1.296              |
Writing electronic reports | 2.32 | 1.472
---|---|---
Awareness of the concept of intellectual property and keenness to apply it in e-learning | 2.31 | 1.421
Achieving interaction between me and the students on the one hand, and the students themselves in the field of e-learning | 2.31 | 1.427
Follow up the performance of each student in studying the electronic course and provide assistance when necessary | 2.21 | 1.278
Preparing enrichment and remedial programs for students | 2.19 | 1.214
Providing the necessary guidance and direction to students in the skills and techniques they need to master e-learning | 2.16 | 1.216
Clarify the concept of intellectual property, copyright and use for students | 2.12 | 1.375

The table above shows for the third domain: The challenges of e-learning management were to a small degree, with a mean of 2.27 and a standard deviation of 0.882.

Fourth Domain: Challenges of Scientific Research on the Internet

| N | Rank | Items | Mean | Standard deviation |
|---|---|---|---|---|
| 2 | 1 | Using different search engines such as Yahoo, Google and others to access the information I need | 3.16 | 1.735 |
| 1 | 2 | Proficiency in the English language to be able to use the Internet in the field of scientific research | 2.86 | 1.619 |
| 7 | 3 | Determine the appropriate keywords, the key word needed to reach, that serve my purpose in the research I do | 2.85 | 1.643 |
| 6 | 4 | Dealing with refereed electronic scientific journals for research and publication | 2.73 | 1.554 |
| 3 | 5 | Access to global libraries, databases and research centers | 2.71 | 1.607 |
| 5 | 6 | Knowledge of electronic information sources | 2.65 | 1.540 |
| 4 | 7 | Follow-up of scientific publications and modern software in the field of e-learning | 2.49 | 1.524 |

The table above shows for the fourth domain: The challenges of scientific research via the Internet were of a medium degree, with a mean of 2.78 and a standard deviation of 1.198.

Fifth Domain: University financial and administrative challenges for e-learning

| N | Rank | Items | Mean | Standard deviation |
|---|---|---|---|---|
| 3 | 1 | Technological infrastructure to provide and make e-learning programs successful | 2.46 | 1.180 |
| 1 | 2 | Availability of financial support for e-learning programs | 2.45 | 1.126 |
| 4 | 3 | The high financial cost of e-learning programs and equipment | 2.42 | 1.155 |
| 7 | 4 | Availability of an appropriate number of computers connected to the Internet, with a special number for each student to enter | 2.35 | 1.245 |
| 2 | 5 | Availability of university administrative support and encouragement for e-learning programs | 2.35 | 1.109 |
| 6 | 6 | Availability of computer labs and equipment for e-learning and internet connectivity | 2.31 | 1.247 |
| 5 | 7 | Availability of the two samples needed to operate and maintain e-learning technologies | 2.30 | 1.217 |
The table above shows for the fifth domain: university financial and administrative challenges for e-learning were of a small degree, with a mean of 2.38 and a standard deviation of 0.841.

**Sixth domain:** General professional challenges for a faculty member in the field of e-learning

| N | Rank | Items                                                                 | Mean  | Standard deviation |
|---|------|----------------------------------------------------------------------|-------|--------------------|
| 6 | 1    | Faculty member's concern about promotion and confirmation            | 2.54  | 1.142              |
| 3 | 2    | Job security and fear of losing a job                                | 2.48  | 1.203              |
| 2 | 3    | Heavy teaching load for a faculty member, which negatively affects the development and application of e-learning programs | 2.41  | 1.139              |
| 7 | 4    | The faculty member’s concern about the application of e-learning programs and his resistance to changing traditional teaching methods | 2.36  | 1.268              |
| 5 | 5    | Availability of sufficient time for the faculty member to prepare and develop e-learning programs | 2.34  | 1.139              |
| 4 | 6    | The major transformation of e-learning to improve the outcomes of the educational process | 2.26  | 1.108              |
| 1 | 7    | Availability of courses and training programs for faculty members in the field of e-learning | 2.22  | 1.163              |

The table above shows the sixth domain: General professional challenges for a faculty member in the field of e-learning were of a small degree, with a mean of 2.37 and a standard deviation of 0.717.

**Seventh Domain:** Challenges of E-Learning Assessment

| N | Rank | Items                                                                 | Mean  | Standard deviation |
|---|------|----------------------------------------------------------------------|-------|--------------------|
| 6 | 1    | Conducting e-learning tests and implementing them by students        | 2.35  | 1.239              |
| 7 | 2    | Evaluating students' technical and technological competencies before starting e-learning | 2.54  | 1.289              |
| 8 | 3    | Using assessment results to improve e-learning                       | 2.50  | 1.240              |
| 1 | 4    | Monitoring the performance of each student in studying the electronic course and its progress | 2.42  | 1.287              |
| 5 | 5    | Use and apply various methods of e-learning assessment               | 2.35  | 1.239              |
| 2 | 6    | Identify the difficulties that students face in e-learning and help them solve them | 2.30  | 1.093              |
| 3 | 7    | Identifying students' strengths and weaknesses in e-learning         | 2.23  | 1.126              |
| 4 | 8    | Provide feedback to students during e-learning                      | 2.20  | 1.079              |

The table above shows the seventh domain: The challenges of e-learning evaluation were of a low degree, with a mean of 2.27 and a standard deviation of 0.082.

It is evident from Table (4) that the field of scientific research challenges via the Internet constitutes the greatest learning challenges facing faculty members in Jordanian public universities, with a mean of (2.78) and a standard deviation of (1.198). Followed by the domain of technical challenges for the use of e-learning techniques with a mean of (2.72) and a standard deviation of (1.120), and the domain of planning and design challenges for e-learning came with the lowest mean of (2.26).
Table 4

Arithmetic averages and standard deviations of the fields of study arranged in descending order according to the arithmetic means

| Rank | Domain                                                   | Mean  | Standard deviation | Degree of challenge |
|------|----------------------------------------------------------|-------|--------------------|---------------------|
| 1    | Online research challenges                               | 2.78  | 1.198              | Moderate            |
| 2    | Technical challenges of using e-learning techniques      | 2.72  | 1.120              | Moderate            |
| 3    | University financial and administrative challenges for e-learning | 2.38  | 0.841              | Low                 |
| 4    | General professional challenges for a faculty member in the field of e-learning | 2.37  | 0.717              | Low                 |
| 5    | E-learning assessment challenges                         | 2.27  | 0.882              | Low                 |
| 5    | E-learning management challenges                         | 2.27  | 0.882              | Low                 |
| 7    | Planning and design challenges for e-learning            | 2.26  | 0.788              | Low                 |
| 8    | Challenges as a whole                                    | 2.047 | 0.693              | Low                 |

It is clear from Table (4) that the arithmetic average of the domain of scientific research challenges via the Internet and the field of technical challenges for the use of e-learning techniques are challenges of a medium degree, while in the remaining domains of challenges they are challenges of a low degree.

It is clear from the previous results that the challenges of scientific research via the Internet came in the first rank in terms of the challenges facing faculty members in Jordanian public universities, and the technical challenges of using e-learning techniques came in the second rank, and financial and administrative challenges for e-learning came in the third, and they came in the third rank. General professional challenges for a faculty member in the field of e-learning ranked fourth, e-learning evaluation challenges came fifth, e-learning management challenges ranked sixth, and planning or design challenges for e-learning ranked seventh, which is the last rank among the domains.

The result of the first rank of e-learning challenges facing faculty members in Jordanian public universities, which are represented by the challenges of scientific research via the Internet, can be explained due to what the Internet search requires from a faculty member to use various search engines such as Yahoo, Google and others to access the required information, and proficiency in the English language to be able to use the Internet effectively, and the ability to deal with electronic scientific fields for the purpose of research and publication, and the ability to access global libraries, databases and research centers. This field constitutes the greatest challenge for a faculty member, although it is to a moderate degree due to the large number of requirements this field requires from a faculty member, as well as computer skills and abilities that he must possess. Given that scientific research via the Internet needs sufficient time from a faculty member.

The result of the second rank of these challenges can be explained, which is the technical challenges of using e-learning techniques, given what this field also requires from the faculty member of computer capabilities and skills that he must possess, such as how to deal with the desktop, files and programs, whether by saving, transferring, deleting or modifying or sending and receiving e-mail messages and circulating them to a group of users at the
same time, or using a scanner or using the Netscape, Explorer, or dealing with input and output units, or using the Office program and electronic spreadsheets, or uploading files to the network and saving them, or using the Data Show Projector, or downloading files from the network and saving them, bearing in mind that the challenges in the first and second ranks were moderate. While the rest of the challenges in the remaining five domains from the third to the seventh came to a low degree, and the researchers believe that the challenges in the order from the third to the seventh came with a low degree because they are either related to administrative and financial reasons beyond the will and ability of a faculty member, or professional challenges imposed on a member of the teaching staff, such as the lack of courses and training programs at the university, the heavy teaching load, or concerns about job security and concern about promotion and installation. Moreover, the challenges of e-learning management, planning and design for it do not require the skills and capabilities required by scientific research via the Internet or the technical skills to use e-learning techniques, as it places the fields in the first and second ranks of the faculty member in direct interaction with the e-learning system and the learner, and this is the largest challenge in the field of e-learning, given what this new educational position requires from the faculty member in terms of changing teaching patterns and how to deal with students, and the extent to which the faculty member needs to prepare and prepare for e-learning, whether in terms of time or effort, or acquiring new technological skills that he did not need in traditional learning. Also, many faculty members suffer from weakness in possessing the computer skills necessary to use the e-learning system.

Results related to the answer to the second question: What courses have the faculty members attended in Jordanian public universities in the field of e-learning?

Table (5) indicates the courses in which the study sample participated and in which they did not participate in the field of e-learning.

| The course | Number of participants | Percentage | Number of non-participants | Percentage |
|------------|------------------------|------------|---------------------------|------------|
| ICDL       | 166                    | 73.5       | 60                        | 26.5       |
| WORLDLINK  | 32                     | 14.2       | 194                       | 85.8       |
| INTEL      | 34                     | 15         | 192                       | 85         |
| INTERNET   | 90                     | 39.8       | 136                       | 60.2       |

It is evident from Table (5) that the ICDL course had the highest participation rate of 73.5%, followed by the INTERNET course with a participation rate of 39.8%, while the WORLDLINK course and the INTEL course had a participation rate of 14.2% and 15%, respectively.

It can be explained why the participants attended a higher rate for the ICDL course, as it is the basic course in the use of computers, which is usually held by universities free of charge for faculty members, and many institutions require that those who want to work for them obtain such a course. It is the most popular course in academic and administrative circles to demonstrate that its holder is reasonably proficient in the use of computers.

As for the INTERNET course, which ranked second in the number of participants, it is often provided by both private and public universities to faculty members free of charge to
encourage them to enter the field of e-learning and to encourage them to use the Internet in scientific research.

As for the low percentage of participants in the WORLDLINK and INTEL courses, this is due to the fact that private and public universities often do not hold courses in this field for faculty members, and those who attended these courses are attributed to the personal initiative of the faculty member who aspires to improve his abilities and skills in the field of learning. Also, some of them are keen to attend such courses to obtain documents proving any external party that requires a faculty member to take such courses to work for them.

Results related to the answer to the third question: Are there statistically significant differences between the views of faculty members in Jordanian public universities regarding e-learning challenges due to gender, experience, college and university?

Table 6

| Rank | Domain                                        | Gender | N  | Mean | Standard deviation | T value | Sig |
|------|-----------------------------------------------|--------|----|------|--------------------|---------|-----|
| 1    | Online research challenges                    | Male   | 80 | 2.81 | 1.271              | 0.433   | 0.666|
|      |                                               | Female | 33 | 2.70 | 1.012              |         |     |
| 2    | Technical challenges of using e-learning technologies | Male   | 80 | 2.78 | 1.111              | 0.942   | 0.384|
|      |                                               | Female | 33 | 2.56 | 1.142              |         |     |
| 3    | University financial and administrative challenges for e-learning | Male   | 80 | 2.43 | 0.820              | 1.091   | 0.278|
|      |                                               | Female | 33 | 2.24 | 0.889              |         |     |
| 4    | General professional challenges for a faculty member in e-learning | Male   | 80 | 2.44 | 0.720              | 1.486   | 0.140|
|      |                                               | Female | 33 | 2.22 | 0.697              |         |     |
| 5    | E-learning assessment challenges              | Male   | 80 | 2.38 | 0.725              | 0.264   | 0.792|
|      |                                               | Female | 33 | 2.34 | 0.983              |         |     |
| 6    | E-learning management challenges              | Male   | 80 | 2.35 | 0.944              | 1.544   | 0.125|
|      |                                               | Female | 33 | 2.07 | 0.682              |         |     |
| 7    | Planning and design challenges for e-learning | Male   | 88 | 2.33 | 0.811              | 1.536   | 0.127|
|      |                                               | Female | 33 | 2.08 | 0.711              |         |     |
| 8    | Challenges as a whole                         | Male   | 80 | 2.53 | 0.694              | 1.364   | 0.175|
|      |                                               | Female | 33 | 2.33 | 0.684              |         |     |

When studying the impact of the gender variable on the seven domains of study, the researchers found that the gender variable has no statistical significance and therefore there are no statistically significant differences at the level ($\alpha = 0.05$) from the point of view of the faculty members in Jordanian public universities that are attributed to gender in all domains of e-learning challenges.

The researchers attributed the reason for this to the fact that male and female faculty members study in the same Jordanian public universities on which the study was conducted, and faculty members in each university use the same educational facilities and laboratories, whether male or female, although the arithmetic average tends to favor males in all domains. However, although there are differences in the arithmetic averages in all domains.
in favor of males, these differences do not rise to the level of statistical significance ($\alpha = 0.05$), and the apparent differences in the arithmetic averages can be explained by the fact that female faculty members are better in applying computer skills than males, according to the researchers' opinion, and from their observations of the use of computer and Internet skills by both sexes, and therefore male faculty members are more aware of the challenges of e-learning. It is worth noting that none of the previous studies to which the researchers referred did not address the gender variable in e-learning challenges from the viewpoint of faculty members in higher education.

When studying the impact of the college type variable (scientific, human) on the seven domains of study, the researchers found that the college type variable has a statistical significance, as there are statistically significant differences at the significance level ($\alpha = 0.05$) from the perspective of faculty members in Jordanian public universities in the challenges of E-learning is due to the variable of the type of college (scientific, humanitarian) and in favor of the humanities colleges. Table (7) illustrates this.

### Table 7

| Domain Rank | Domain                                           | Type of college | N  | Mean | Standard deviation | T value | Sig    |
|-------------|--------------------------------------------------|-----------------|----|------|--------------------|---------|--------|
| 1           | Online research challenges                       | Scientific      | 55 | 2.52 | 1.199              | 2.294   | 0.024  |
|             |                                                  | Humanity        | 58 | 3.02 | 1.154              |         |        |
| 2           | Technical challenges of using e-learning techniques| Scientific      | 55 | 2.56 | 1.107              | 1.407   | 0.162  |
|             |                                                  | Humanity        | 58 | 2.86 | 1.122              |         |        |
| 3           | University financial and administrative challenges for e-learning | Scientific      | 55 | 2.23 | 0.824              | 1.776   | 0.079  |
|             |                                                  | Humanity        | 58 | 2.51 | 0.842              |         |        |
| 4           | General professional challenges for a faculty member in e-learning | Scientific      | 55 | 2.21 | 0.598              | 2.456   | 0.016  |
|             |                                                  | Humanity        | 58 | 2.53 | 0.787              |         |        |
| 5           | E-learning assessment challenges                 | Scientific      | 55 | 2.26 | 0.824              | 1.352   | 0.179  |
|             |                                                  | Humanity        | 58 | 2.47 | 0.779              |         |        |
| 6           | E-learning management challenges                 | Scientific      | 55 | 1.97 | 0.701              | 3.725   | 0.000  |
|             |                                                  | Humanity        | 58 | 2.56 | 0.976              |         |        |
| 7           | Planning and design challenges for e-learning    | Scientific      | 55 | 2.04 | 0.689              | 3.006   | 0.003  |
|             |                                                  | Humanity        | 58 | 2.47 | 0.824              |         |        |
| 8           | Challenges as a whole                            | Scientific      | 55 | 2.28 | 0.629              | 2.933   | 0.004  |
|             |                                                  | Female          | 33 | 2.33 | 0.684              |         |        |

When studying Table (7), it becomes clear that the variable type of college has a statistically significant effect in the domain of scientific research challenges via the Internet and in favor of the humanities colleges at the significance level ($\alpha = 0.05$), this variable has a statistical significance in the field of professional challenges for a faculty member in e-learning and in favor of the humanities faculties also at the significance level ($\alpha = 0.05$), and it has a statistically significant effect also in the domain of e-learning.
management challenges at the significance level ($\alpha = 0.05$) and in favor of the humanities faculties, and it has an impact in the field of planning and design challenges for e-learning at the level of significance ($\alpha = 0.05$) and for the benefit of humanities colleges as well. In the sense that faculty members in humanities faculties face more challenges in e-learning than their colleagues in scientific faculties, this result can be explained by the fact that faculty members in scientific faculties may have taken courses in computer and internet application by virtue of their scientific specializations more than their colleagues in humanities faculties. Hence, the researchers expect that faculty members’ skills in the fields of computer and internet applications will be much better than their colleagues in humanities faculties.

When studying Table (7) again, we find that the degree of e-learning challenges from the perspective of faculty members in humanities colleges was medium, with an arithmetic mean (2.65) and a standard deviation of (0.708), while the degree of e-learning challenges from the perspective of faculty members in Scientific faculties have a low score with an arithmetic mean (2.28) and a standard deviation (0.629). In detail, this applies to the areas of e-learning management challenges, where the degree of challenges in humanities colleges was medium, with a mean of (2.56) and a standard deviation of (0.945), while it was at a low degree in scientific colleges with a mean of (1.97) and a standard deviation of (0.701). This also applies to the field of general professional challenges for a faculty member in e-learning, as these challenges were moderately in humanitarian colleges from the faculty members’ perspective, with a mean of (2.53) and a standard deviation of (0.787). This result also applies to the domain of university financial and administrative challenges for e-learning, as these challenges from the perspective of faculty members in this field were moderately in the humanities faculties, where their arithmetic mean was (2.51) and with a standard deviation of (0.842), while they were at a low degree in scientific faculties, with an arithmetic average of (2.23) and with a standard deviation of (0.824).

### Table 8

| Domain                                               | N  | Mean | Standard deviation |
|------------------------------------------------------|----|------|--------------------|
| Online research challenges                           | 113| 2.78 | 1.198              |
| Technical challenges of using e-learning techniques  | 113| 2.72 | 1.120              |
| University financial and administrative challenges for e-learning | 113| 2.38 | 0.841              |
| General professional challenges for a faculty member in e-learning | 113| 2.37 | 0.717              |
| E-learning assessment challenges                     | 113| 2.37 | 0.805              |
| E-learning management challenges                     | 113| 2.27 | 0.882              |
| E-learning planning and design challenges            | 113| 2.26 | 0.788              |
| Challenges as a whole                                | 113| 2.47 | 0.693              |
It is clear from Table (8) that the challenges of scientific research via the Internet came to a medium degree, with a mean of (2.78) and a standard deviation of (1.198), also, the technical challenges of using e-learning techniques came to a medium degree, with a mean of (2.72) and a standard deviation of (1.120).

As for the rest of the other five domains of challenges, they came to a low degree, where the university’s administrative financial challenges were with an arithmetic mean of (2.38) and a standard deviation (0.841), then the professional challenges in the domain of e-learning came to a low degree, with an arithmetic mean of (2.37) and a standard deviation of (0.717), the domain of e-learning evaluation challenges came with a mean of (2.37) and a standard deviation of (0.805), and the arithmetic mean of the domain of e-learning management challenges was (2.27) and a standard deviation of (0.882), and the arithmetic mean of the domain of planning and design challenges for e-learning was (2.26) and a standard deviation of (0.788).

The researchers believe that the fields of scientific research via the Internet and the field of technical challenges to the use of e-learning techniques were moderately from the point of view of the faculty members, as they require the faculty member to have computer skills that he must master in order to be able to use them in scientific research, and e-learning requires the use of computer technologies. As for the rest of the other fields, they pose challenges to a low degree for the faculty member, either because they are not related to the faculty member himself, such as the challenges of e-learning management, or the financial and administrative challenges of the university, or they are less directly related to e-learning, such as planning and design challenges, and e-learning evaluation challenges.

When studying the effect of the academic rank variable (instructor + full-time lecturer), (assistant professor), (associate professor and above) on the seven domains of study, the researchers found that the academic rank variable has no statistical significance on the domains for each at the significance level (α= 0.05) from the perspective of Faculty members in Jordanian public universities in e-learning challenges due to the academic rank variable, Table (9) shows this, and for the benefit of the faculty members, the category of instructor + full-time lecturer, meaning that this category faces financial and administrative challenges for e-learning more than the category of assistant professor and the category of associate professor and above. The reason for this may be attributed to the novelty of their technology in the university and the university administration’s focus on providing technologies to the category of assistant professor and associate professor before providing them to the category of full-time teacher and lecturer. These universities are keen to provide what is necessary for the higher ranks of the faculty to protect them from contracting with other universities, bearing in mind that the conditions of special accreditation for each specialization require a certain percentage of the higher academic ranks of the rank of assistant professor and associate professor or higher.

Table 9

Analysis of variance for the domains of e-learning challenges facing faculty members in Jordanian public universities according to the academic rank variable

| Domain                        | Academic Rank                | Sum of squares | df | Mean squares | F value | Sig  |
|-------------------------------|------------------------------|----------------|----|--------------|---------|------|
| Online research challenges    | Instructor + lecturer        | 2.603          | 2  | 1.301        | 0.905   | 0.407|
|                               | Assistant Professor          | 158.130        | 110| 1.438        |         |      |
|                               | Associate Professor and above| 160.732        | 112|              |         |      |
When studying the impact of the experience variable (1-5) years, (6-10) years, (11 years and more) on the seven domains of study, the researchers found, as shown in Table (10) that the fields as a whole came to a low degree with an arithmetic mean of (2.47) and a standard deviation of (0.693). As for the field of scientific research challenges via the Internet, it came to a medium degree, with an arithmetic mean of (2.78) and a standard deviation of (1.198), and the field of technical challenges for the use of e-learning techniques also came to a medium degree, with an arithmetic mean of (2.72) and a standard deviation of (1.120), as for the rest of the other five domains, they were of a low degree, as follows: the domain of university financial and administrative challenges for e-learning, with a mean of (2.38) and a standard deviation (0.841), and a domain of general professional challenges for a faculty member with a mean (2.37) and a standard deviation of (0.717), and the domain of e-learning evaluation challenges with a mean (2.37) and a standard deviation (0.805), and the domain of e-learning management challenges with a mean (2.27) and a standard deviation (0.882), and finally the domain of e-learning planning and correction challenges with an arithmetic mean (2.26) and a standard deviation of (0.788).

Table 10

Arithmetic averages and standard deviations of the domains of e-learning challenges facing faculty members in Jordanian public universities according to the variable of experience
The researchers attributed the reason for facing faculty members in the field of scientific research challenges and in the field of technical challenges to use e-learning techniques more than the rest of the fields, because these two fields require the faculty member computer skills that the faculty member must master in order to be able to use them in scientific research on the one hand, and on teaching on the other hand, as for the rest of the fields, they are less directly related to the process of teaching and scientific research, and less embarrassing to the faculty member because they do not focus directly on the skills that he must master and that are directly related to their use in the scientific research and teaching processes.

**Table 11**

Variance analysis of the areas of e-learning challenges facing faculty members in private Jordanian universities according to the variable of experience

| Domain                                | Source of variance | Sum of squares | df  | Mean squares | F value | Sig   |
|---------------------------------------|--------------------|----------------|-----|--------------|---------|-------|
| Online research challenges            | Between groups     | 62.56          | 2   | 3.128        | 2.228   | 0.113 |
|                                       | Within groups      | 154.476        | 110 | 1.404        |         |       |
|                                       | Total              | 160.732        | 112 |              |         |       |

The researchers attributed the reason for facing faculty members in the field of scientific research challenges and in the field of technical challenges to use e-learning techniques more than the rest of the fields, because these two fields require the faculty member computer skills that the faculty member must master in order to be able to use them in scientific research on the one hand, and on teaching on the other hand, as for the rest of the fields, they are less directly related to the process of teaching and scientific research, and less embarrassing to the faculty member because they do not focus directly on the skills that he must master and that are directly related to their use in the scientific research and teaching processes.
It is clear from the previous table that the experience variable has no statistical significance as a whole on the e-learning challenges facing faculty members in Jordanian public universities at the significance level ($\alpha = 0.05$), it also had no statistical significance for any of the seven areas of study. The reason for this may be due to the recent issue of e-learning in Jordanian universities in general, and especially in Jordanian public universities, which reduces the impact of the experience variable on this number.

When studying the impact of the experience variable on the seven fields of study, the researchers found that the experience variable has no statistical significance, and therefore there are no statistically significant differences at the level ($\alpha = 0.05$) in e-learning challenges from the perspective of faculty members in Jordanian public universities due to experience. Table (11) shows that there are no statistically significant differences at the level of significance ($\alpha = 0.05$) from the perspective of faculty members in Jordanian public universities in the challenges of e-learning in the seven domains of study.

Table (10) in the appendix shows that the arithmetic mean of the category of faculty members with experience 1-5 years is greater than the arithmetic average of the category 6-10 years and the experience category of 11 years or more in the planning and design challenges of e-learning and the category of general professional challenges.

It turns out that the arithmetic mean for the category 1-5 years was (2.52) with a standard deviation of (0.703), and for the category of 11 years and over it was (2.55), with a standard deviation of (0.713).

This indicates that the e-learning challenges faced by faculty members due to the variable of experience were moderate, while for the second category (2.32) 6-10 years, the challenges were of a low degree.
Table 12

Arithmetic averages and standard deviations of the domains of e-learning challenges facing faculty members in Jordanian public universities according to the university variable

| Domain                                      | University                      | N  | Mean | Standard deviation |
|---------------------------------------------|---------------------------------|----|------|--------------------|
| Online research challenges                  | Al Balqa Applied University     | 44 | 3.12 | 1.138              |
|                                             | Mutah University                | 16 | 3.04 | 1.442              |
|                                             | Jarash Private University       | 30 | 2.37 | 1.088              |
|                                             | Tafila Technical University     | 23 | 2.48 | 1.094              |
| Total                                       |                                 | 113| 2.78 | 1.198              |
| Technical challenges of using e-learning techniques | Al Balqa Applied University | 44 | 3.10 | 1.159              |
|                                             | Mutah University                | 16 | 3.03 | 1.280              |
|                                             | Jarash Private University       | 30 | 2.19 | 0.927              |
|                                             | Tafila Technical University     | 23 | 2.45 | 0.830              |
| Total                                       |                                 | 113| 2.72 | 1.120              |
| University financial and administrative challenges for e-learning | Al Balqa Applied University | 44 | 2.70 | 0.733              |
|                                             | Mutah University                | 16 | 2.62 | 0.823              |
|                                             | Jarash Private University       | 30 | 2.00 | 0.821              |
|                                             | Tafila Technical University     | 23 | 2.07 | 0.813              |
| Total                                       |                                 | 311| 2.38 | 0.840              |
| General professional challenges for a faculty member | Al Balqa Applied University | 44 | 2.368| 0.646              |
|                                             | Mutah University                | 16 | 2.30 | 0.786              |
|                                             | Jarash Private University       | 30 | 2.8  | 0.694              |
|                                             | Tafila Technical University     | 23 | 2.21 | 0.343              |
| Total                                       |                                 | 113| 2.37 | 0.717              |
| E-learning assessment challenges            | Al Balqa Applied University     | 44 | 2.55 | 0.793              |
|                                             | Mutah University                | 16 | 2.39 | 0.660              |
|                                             | Jarash Private University       | 30 | 2.20 | 0.881              |
|                                             | Tafila Technical University     | 23 | 2.22 | 0.787              |
| Total                                       |                                 | 113| 2.37 | 0.805              |
| E-learning management challenges            | Al Balqa Applied University     | 44 | 2.72 | 1.031              |
|                                             | Mutah University                | 16 | 2.21 | 0.635              |
|                                             | Jarash Private University       | 30 | 1.93 | 0.622              |
|                                             | Tafila Technical University     | 23 | 1.90 | 0.620              |
| Total                                       |                                 | 113| 2.27 | 0.882              |
| E-learning planning and design challenges   |                                 |    |      |                    |
|                                             | Mutah University                | 16 | 2.32 | 0.700              |
|                                             | Jarash Private University       | 30 | 1.77 | 0.563              |
|                                             | Tafila Technical University     | 23 | 2.14 | 0.816              |
| Total                                       |                                 | 113| 2.26 | 0.788              |
| Challenges as a whole                       | Al Balqa Applied University     | 44 | 2.82 | 0.663              |
|                                             | Mutah University                | 16 | 2.60 | 0.678              |
|                                             | Jarash Private University       | 30 | 2.08 | 0.590              |
|                                             | Tafila Technical University     | 23 | 2.23 | 0.539              |
| Total                                       |                                 | 113| 2.47 | 0.693              |
It is clear from the previous table that the domains as a whole came to a low degree with an arithmetic mean of (2.47) and a standard deviation of (0.693). The following two domains came to a moderate degree, the challenges of scientific research via the Internet, with a mean of (2.78) and a standard deviation of (1.198), and technical challenges of using e-learning techniques with an average of (2.72) and a standard deviation of (1.120). As for the rest of the fields, they came to a low degree as follows: the domain of university financial and administrative challenges with an arithmetic mean (2.38) and a standard deviation of (0.841), and the domain of professional challenges for a faculty member in e-learning with an arithmetic mean (2.37) and a standard deviation of (0.717), and the domain of e-learning evaluation challenges with a mean (2.37) and a standard deviation of (0.805), e-learning management challenges with a mean (2.27) and a standard deviation of (0.882), and the domain of e-learning planning and design challenges with an arithmetic mean (2.26) and a standard deviation (0.788). This means that the challenges of scientific research via the Internet and the technical challenges of using e-learning techniques pose greater challenges to faculty members than other fields. The researchers previously explained the reasons for this when studying the impact of the variables of experience, academic rank, gender, and type of college on the seven fields of study.

It is also clear from Table (12) that the degree of e-learning challenges facing faculty members at Al-Balqa Applied University and Mutah University was moderate in all fields, while it was a low grade at the Universities of Jerash and Tafila Technical University. The reason for this can be attributed to the technology of universities that hold free courses for faculty members in the areas of e-learning and computer skills, and may require this in the appointments and promotions of faculty members.

**Table 13**

Analysis of variance of e-learning domains facing faculty members in Jordanian public universities according to the university variable

| Domain                                           | Source of variance | Sum of squares | df  | Mean squares | F value | Sig   |
|--------------------------------------------------|--------------------|----------------|-----|--------------|---------|-------|
| Online research challenges                       | Between groups     | 13.141         | 3   | 4.380        | 3.235   | 0.025 |
|                                                  | Within groups      | 147.591        | 109 | 1.354        |          |       |
|                                                  | Total              | 160.732        | 112 |              |         |       |
| Technical challenges of using e-learning techniques | Between groups     | 18.053         | 3   | 6.018        | 5.361   | 0.002 |
|                                                  | Within groups      | 122.360        | 109 | 1.123        |          |       |
|                                                  | Total              | 140.414        | 112 |              |         |       |
| General professional challenges for a faculty member in e-learning | Between groups     | 7.346          | 3   | 2.449        | 5.310   | 0.002 |
|                                                  | Within groups      | 50.267         | 109 | 0.641        |          |       |
|                                                  | Total              | 57.614         | 112 |              |         |       |
| E-learning assessment challenges                 | Between groups     | 2.815          | 3   | 0.938        | 1.468   | 0.227 |
|                                                  | Within groups      | 69.680         | 109 | 0.639        |          |       |
|                                                  | Total              | 72.495         | 112 |              |         |       |
| E-learning management challenges                 | Between groups     | 15.802         | 3   | 5.267        | 8.043   | 0.000 |
|                                                  | Within groups      | 71.383         | 109 | 0.655        |          |       |
|                                                  | Total              | 87.185         | 112 |              |         |       |
It is clear from Table (13) that the university variable has a statistically significant effect at the significance level ($\alpha= 0.000$) on the study tool as a whole and on all areas of the study tool except for the field of e-learning evaluation challenges, where the level of statistical significance for the other six domains was as follows: The domain of challenges of scientific research via the Internet ($\alpha= 0.025$), and the domain of technical challenges for the use of e-learning technology ($\alpha= 0.002$), and the domain of challenges for a faculty member in e-learning ($\alpha= 0.002$), and the domain of challenges of e-learning management ($\alpha= 0.000$), and the domain of challenges of planning and designing e-learning ($\alpha= 0.000$), and the domain of university financial and administrative challenges ($\alpha= 0.000$), for the benefit of Al Balqa Applied University. In other words, the e-learning challenges faced by faculty members are greater and more severe than those faced by the rest of their fellow faculty members in other Jordanian public universities that were included in the study, the reason for this can be attributed to the recent appointment of faculty members in Al Balqa Applied University, as the newly appointed people may not have attended training courses in the field of e-learning, and this university may not have required the faculty member to have advanced computer skills to use the computer in education, but rather, upon appointment, it was satisfied that the faculty member hold a certificate of specialization in a specific subject.

**Discussion of Results**

It is clear from the previous results that the challenges of scientific research via the Internet ranked first in terms of the challenges facing faculty members in Jordanian public universities. The technical challenges of using e-learning techniques came in the second rank, financial and administrative challenges for e-learning in the third rank, and general professional challenges for a faculty member in the field of e-learning came in the fourth rank. The challenges of evaluating e-learning came in the fifth rank, and the challenges of e-learning management occupied the sixth rank, and the challenges of planning or designing e-learning came in the seventh rank, which is the last rank among the domains.

The result of the first rank of e-learning challenges facing faculty members in Jordanian public universities can be explained, which are the challenges of scientific research via the Internet, given what it requires from the faculty member to use various search engines such as Yahoo, Google, and others to access the required information, and proficiency in the English language to be able to use the Internet effectively, and the ability to deal with electronic scientific fields for the sake of research and publication, and the ability to access global libraries, databases and research centers. This domain
constitutes the greatest challenge for a faculty member, although it is moderately high because this domain requires a faculty member and computer skills and abilities that he must possess. Given that scientific research via the Internet needs sufficient time from a faculty member. The result of the second order of these challenges can be explained, which is the technical challenges of using e-learning techniques, given what this field also requires from the faculty member of computer capabilities and skills that he must possess, such as how to deal with the desktop, files and programs, whether by saving, transferring, deleting or modifying or sending and receiving e-mail messages and circulating them to a group of users at the same time, or using a scanner, using Netscape, Explorer, dealing with input and output units, using Office software and spreadsheets, uploading files to the network and saving them, using a Data Show Projector, or downloading files from the network and saving them. The study results agreed with Marques et al, [17] study, where, according to the study, teachers faced a problem of poor training; Because of the sudden transition to distance education, note that the challenges in the first and second ranks were of a medium degree, while the rest of the challenges in the remaining five fields from the third to the seventh came to a low degree, and the researchers believe that the challenges in the ranking from the third to the seventh came to a low degree because either they are related to administrative and financial reasons beyond the will and ability of a faculty member, or professional challenges imposed on the faculty member, such as the lack of courses and training programs at the university, this agreed with the results of [18] study, or the heavy teaching load, job security concerns, worries about promotion and tenure. Also, the challenges of e-learning management, planning and design for it do not require the skills and capabilities required by scientific research via the Internet or the technical skills to use e-learning techniques, as it places the domains in the first and second ranks of the faculty member in direct interaction with the e-learning system and the learner, and this is the largest challenge in the field of e-learning, given what this new educational position requires from the faculty member in terms of changing teaching patterns and how to deal with students, and the extent to which the faculty member needs preparation for e-learning, whether in terms of time or effort, or acquiring new technological skills that he did not need in traditional learning, as in the study of [19] which prompted teachers to work on mastering the use of distance education tools. Also, many faculty members suffer from weakness in possessing the computer skills necessary to use the e-learning system. The results of this study agree with those of Terenko & Ogienko [21], and Galeoto et al, [20].

Conclusion

Coronavirus Pandemic sheds its light on all aspects of life, especially the educational aspect. Things changed, the way to teach is no more face to face, and educators are forced to teach their students using technology. E-learning spread widely all over the world, and faculty members in universities are obliged to transfer to it even if they are not well trained to use it; thus, faculty members face many challenges in using e-learning. The researchers in this study shed light on these challenges and investigated the faculty members’ perspectives about these challenges.
In light of the results of this study, the researchers recommend the following:

- The necessity for Jordanian public universities to hold free training courses for their faculty members on the use of search engines, access to international libraries, databases and research centers, and dealing with refereed electronic scientific journals in order to encourage them to research and publish.
- It is necessary for Jordanian public universities to hold free training courses for their faculty members to provide them with communication skills through electronic means, download files from the network and save them, upload files to the network, use multimedia and data projectors, produce presentations, use electronic tables, and how to deal with the desktop, so that they can use e-learning techniques.
- The necessity of holding training courses for faculty members in Jordanian public universities in the field of computer use, such as the WORLDLINK course, the INTEL course, and other similar courses, to provide them with skills in the use of computers and e-learning techniques.
- The necessity of holding training courses in particular for faculty members in humanities colleges in Jordanian public universities in the field of e-learning.
- Focus on holding training courses for new faculty members, especially full-time instructors and lecturers, in the field of e-learning.

REFERENCES

1. Kazem, S. (2021). The reality of distance education in Iraqi universities under the Corona pandemic, from the point of view of students and faculty members. [Unpublished Master thesis], Department of Administration and Curriculum, Faculty of Educational Sciences, Middle East University, Jordan. Available at: https://meu.edu.jo/libraryTheses/pdf.
2. Yulia, H. (2020). Online Learning to Prevent the Spread of Pandemic Corona Virus in Indonesia. ETERNAL (English Teaching Journal). 11(1), 48-56.
3. Al- Khatib, M. (2020). The challenges of e-learning in light of the Corona crisis and beyond. Available at: https://www.aljazeera.net/opinions
4. Sawalhieh, E. (2020). Integrating e-learning and legal education in light of crises. Journal of Studies in the Humanities and Social Sciences, 3(4), 115-132.
5. Basilaia, G., &Kvavadze, D. (2020). Transition to Online Education in Schools during a SARS-CoV-2 Coronavirus (COVID-19) Pandemic in Georgia. Pedagogical Research, 5(4), em0060. DOI: 10.29333/pr/7937
6. eLearning NC (2018). Available at: http://www.elearningnc.gov/about_elearning/what_is_elearning/
7. Al-Awadi, R. (2019). The degree of realization of the future role of student teachers in Palestinian universities based on the employment of contemporary technological innovations. Palestine Technical University Journal for Research, 7(1), 56-68.
8. Salahuddin, S. (2021). The impact of technology in education. Available at: https://hyatok.com.
9. Jiménez-Cortés, R. & Aires, L. (2021). Feminist trends in distance and hybrid higher education: a scoping review. International Journal of Educational Technology in Higher Education, 18(60), 1-20. DOI: 10.1186/s41239-021-00297-4.
10. Herman, C., & Kirkup, G. (2017). Combining feminist pedagogy and transactional distance to create gender-sensitive technology-enhanced learning. Gender and Education, 29(6), 781–795. DOI: 10.1080/09540253.2016.1187263.
11. Bates, A. (2020). Online learning and distance education resources. Available at: https://www.tonybates.ca/tag/blog/
12. He, W., Gajski, D., Farkas, G., & Warschauer, M. (2015). Implementing flexible hybrid instruction in an electrical engineering course: The best of three worlds? Computers & Education, 81, 59–68.
13. Beatty, B. J. (2019). Evaluating the impact of hybrid-flexible courses and programs: Highlights from selected studies. In B.L. Beatty (Ed.), Hybrid-flexible course design. EdTech Books. Available at: https://edtechbooks.org/HyFlex/impact.
14. Herman, C., Gracia, R., Macniven, L., Clark, B., & Doyle, G. (2019). Using a blended learning approach to support women returning to STEM. *Open Learning: The Journal of Open, Distance and e-Learning, 34*(1), 40–60.

15. Alraqab, S. (2021). The difficulties of distance education in light of the spread of the Corona virus (COVID-19) from the point of view of teachers and principals of schools in Khan Yunis Governorate in the Gaza Strip, [Unpublished Master thesis], Middle East University, Jordan. Available at: https://meu.edu.jo/libraryTheses.pdf.

16. Abu Shkhedem, S.; Awad, K.; Khalil, S.; Al-Amad, A.; Shadeed, N. (2020). The effectiveness of e-learning in light of the spread of the Corona virus from the point of view of teachers at Palestine Technical University (Kadoorie). *Arab Journal for Scientific Publishing, 21*(1), 365-389. Available at: https://www.ajsp.net/research.pdf.

17. Marques, B., Marques, R., & Reis, R. (2020). Student’s Social Vulnerability in Distance Learning in Covid-19 Times. gilt/isep/ipp deisep Portugal, International Conference e-Learning.

18. Darica, R. & Dina, R. (2020). Transitioning to Online Distance Learning in the COVID-19 Era: A Call for Skilled Leadership in Higher Education Institutions (HEIS). *International Studies in Educational Administration, Canada, 48*(1), 103-110.

19. Rokopenko, I. & Berezhna, S. (2010). Higher Education Institutions in Ukraine during the Coronavirus, or COVID-19, Outbreak: New Challenges vs New Opportunities. *Romanian Journal for Multidimensional Education / Revista Romaneasca pentru Educatie Multidimensional*. 12(1), 130-135.

20. Galeoto, G.; Berardi, A.; Panuccio, F.; Tofani, M.; Mazzaccara, A.; Palese, A.; Saiani, L. & Valente, D. (2021). Development and validation of a test for the assessment of knowledge learned by healthcare students during an online course on COVID-19: cross-sectional study. *Clin Ter, 172* (4): 284-304.

21. Terenko, O. & Ogienko, O. (2020). How to Teach Pedagogy Courses Online at University in COVID-19 Pandemic: Search for Answers. *Romanian Journal for Multidimensional Education, 12*(1), 173-179.

**Information about the authors**

**Dr. Amaal Al Masri**  
(Jordan, As-Salt)  
Assistant Professor  
Princess Alia University College  
Al Balqa Applied University  
E-mail: amaal.masri@bau.edu.jo  
ORCID ID: 0000-0002-8874-755X

**Dr. Samir Rimawi**  
(Jordan, As-Salt)  
Associate Professor, Department of Psychology and Special Education  
Princess Alia University College  
Al Balqa Applied University  
E-mail: srimawi185@gmail.com  
ORCID ID: 0000-0002-8465-3687