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The Effect of Using e-Government Services upon Improving Electronic Services

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The current study sought to reveal the reality of the application of e-government services at the faculties of the Palestine Technical University - Kadoorie (PTUK). Moreover, the researchers aimed to identify and realise the degree of awareness of faculty members, and administrative staff regarding the concept of e-government, the various possibilities of its application, and the most prominent obstacles that prevent its application in an appropriate manner. The researchers followed a descriptive approach to collect and analyse data. A questionnaire was designed for this purpose. Subsequently, after ensuring its validity and reliability, it was applied to the study population. The study sample consisted of 126 respondents, which was comprised of various faculty members and administrative officers. The results of the study showed that the respondents were aware of the concept of electronic government, with an acceptable degree. Furthermore, that they were neutral about the possibility of implementing the e-government system, when they confirmed their agreement to apply its measures in their workplace. The researchers also found that the most prominent obstacles that hinder using e-government include a lack of training courses for faculty members and administrative staff, as well as the constant interruption of the Internet

connection. The results of the study also revealed that there were statistically significant differences at the level of significance (α = 0.05) for the questionnaire domains of the study variables (e.g., workplace, nature of work, years of experience, training courses, technological skills), which may be attributed to those who are working at the PTUK. The researchers recommended that the necessary capabilities to implement the system of e-government should be provided constantly; a strategic plan for a complete transformation towards its application must be set and proposed; training courses for faculty members, and administrative staff should be held; and discretionary incentives to the best faculty that applies the e-government system are to be provided.

Key words: *E-government, Palestine, Palestine technical university - kadoorie.*

Introduction

The majority of countries in today's world are turning to the transition towards the implementation of e-government. It has become a global approach that all countries seek to follow through using and harnessing information and communications technology in implementing various actions, in line with the general context of the international framework. It has been argued that information and communications technology has changed the way in which governments provide services to their citizens. The tendency to employ and use the electronic government and introduce new developments in the field of technology into the work environment, aims to raise the level of performance, which is an important aspect of administrative development. The application and use of e-government requires the availability of many capabilities, as this application aims to provide distinguished services to citizens and business organisations, and thus, improve performance in government organisations and agencies (Hala Khatib, 2019; Mohammed, 2018; Salah & Mohammed, 2019; Twizeyimana & Andersson, 2019).

In light of the great technological development, and the qualitative shift in the development of the systems that the world is currently going through, the need has increased to develop governmental, educational, and administrative electronic systems to keep pace with these developments. Therefore, the information and telecommunication technology provides many facilities and capabilities for officials and educators to carry out their tasks, and in terms of personnel administration and student management, resource management, financial management, and public administration (AlAwadhi, 2019).

There is no doubt that the higher education sector is considered an important tool in the advancement of society, and requires further development of its administrative systems and

organisational structures. This qualitative shift will only take place by accelerating the implementation of the e-government system, and securing the needs of this significant sector, in terms of the technical equipment, and the training of human cadres, and qualifying them to deal with and handle the e-government system (Mohammed, 2018).

Statement of the Problem

With the increasing prevalence of the use of the Internet, and the rapid development that is taking place in the field of electronic business, countries have adapted to benefit from these continuous developments to improve their administrative systems and regulations using the digital technology, the various information and communication technology tools, and the direct repercussions on the performance of their different institutions (Q. Alzaghal & Mukhtar, 2018; Sweis, Sabri, Alzaghal, Mssis, & Awartani, 2019). The application of the e-government program has been adopted by many countries. Consequently, an appropriate creative environment has been established to improve the services of e-government by providing the infrastructure, sound knowledge, tremendous awareness, easy to access communication network, works of ministries and agencies, and human competence (Mohammed, 2018). Therefore, bureaucratic culture and routines prevail in the completion of government transactions by the recipients of governmental services. It is noted that the recipients of governmental services suffer from the phenomenon of crowdedness and accumulation in the waiting lines for long periods, in order to obtain the required services (Adjei-Bamfo, Maloreh-Nyamekye, & Ahenkan, 2019).

Therefore, the Palestine Technical University - Kadoorie is considered one of the most important public universities in Palestine. It provides a set of electronic services through the electronic portal (the Portal), such as admission and registration, tuition fees, student schedule and programs, exam schedules, and other useful services.

After reviewing the literature and recent studies that are related to the topic of the current study, and due to the importance of the university in Palestine, the researchers decided to carry out this study to improve the electronic services, in an effort to reach the distinguished level of advanced international universities. This study seeks to answer the following questions:

1. What is the effect of using e-government upon improving the e-services at the PTUK?
2. What is the level of improvement of the electronic services by using e-government, and in terms of the infrastructure, knowledge and awareness, the communications network, the work of ministries and agencies, and human competencies?

Objectives of the Study

This study seeks to achieve the following goals:

1. Determine the effect of using e-government upon improving the electronic services at the PTUK.
2. Work to improve the level of the electronic services by using e-government, depending on the field of infrastructure.
3. Discuss improving the level of the electronic services by using e-government, according to the field of knowledge and awareness.
4. Identify the level of improvement of the electronic services by using e-government, according to the field of the communication network.
5. Deal with the level of improvement of the electronic services by using the e-government, according to the field of work of the ministries and agencies.
6. Analyse the level of the electronic services by using e-government, according to the field of human competencies.

Importance of the Study

The importance of this study stems from the great significance of completing the e-government project, in addition to the urgent need to know the extent of readiness to build an e-government, which is based on recent studies, and minding the variables of the private reality experienced by the Palestinian Government (Dahleez & Loubbad, 2017).

What distinguishes this study is that it is considered one of the first of its kind. The researchers are interested in studying the concept of e-government at the PTUK, as well as tracing the roots of the concept, in order to reach a concise definition, which is based on all the information provided in the relevant literature. In sum, the current study aims at identifying the concept of e-government, its benefits, the capabilities needed to implement it, and the obstacles that may hinder its application. This study will provide a clear picture of the extent of the application of e-government at the PTUK.

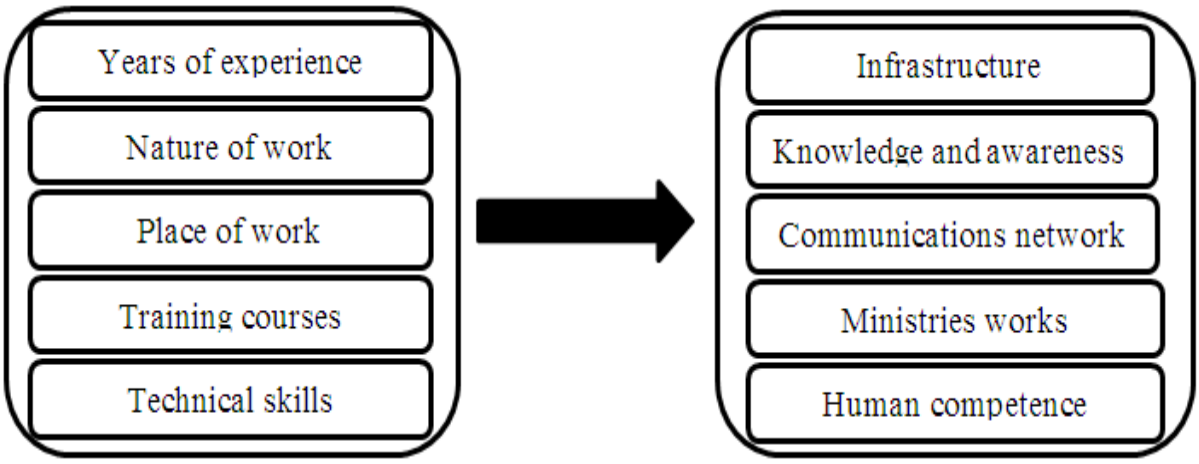
Research Model and Hypotheses

H1: There are no statistically significant differences at the level of significance ($\alpha = 0.05$) for the effect of using e-government upon improving the electronic services that may be attributed to the variable of the workplace in the university.
H2: There are no statistically significant differences at the level of significance ($\alpha = 0.05$) for the effect of using e-government upon improving the electronic services that may be attributed to the variable of the years of experience.

H3: There are no statistically significant differences at the level of significance (α = 0.05) for the effect of using e-government upon improving the electronic services that may be attributed to the variable of the nature of work.
H4: There are no statistically significant differences at the level of significance (α = 0.05) for the effect of using e-government upon improving the electronic services that may be attributed to the variable of the training courses in the field of e-government.
H5: There are no statistically significant differences at the level of significance (α = 0.05) for the effect of using e-government upon improving the electronic services that may be attributed to the variable of the technological skills.

The following Figure 1 shows the proposed model, and the variables.

Figure 1. The proposed model



Literature Review

The information revolution, which has sparked since the beginning of the last decade of the twentieth century, has opened wide horizons for the development of administrative work, especially with these profound and radical transformations that have increased the capacity and speed of information exchange, and in conjunction with the emergence of the global information network (Q. K. Alzaghal & Mukhtar, 2017). These transformations have led to the adoption of a modern management concept that is considered as a shift in administrative practice in the e-government system. Consequently, in its concept, e-government has become an 'umbrella' that covers all applications of information and communications technology. Despite the fact that various governments, in developed and developing countries alike, are looking forward to converting to and opting for the implementation of the concept of e-government, this faces conceptual ambiguity, practical challenges, and environmental data that limit the extent of information available in this area (Abu-Shanab, 2020).

Several Arab and foreign studies have been conducted to investigate the concept of e-government and identify the importance of applying e-government, in order to improve the electronic services that support the education process.

AlAwadhi (2019) aimed to study the confidence factors that affect the use and adoption of e-government services, and their impact on civic engagement. The variables used in this study are related to the theories of technology adoption, in addition to the field of trust, which consists of trust in government, confidence in technology, and confidence in e-government. This study proposed a model and validated it in the context of a developing country. Since this study was of an exploratory nature, a questionnaire survey was conducted using a small sample of 137 participants. The results showed the validity and reliability of the elements that are positively related to one another. The results of the linear analysis of the general model showed a model for trust factors that have significant relationships with the adoption of e-government services that lead to or result in civil participation.

Mohammed (2018) conducted a study to clarify the concept of e-government and its importance in society, especially in educational science. The researcher also aimed to clarify the benefits that will accrue to the citizen when computerising the systems, which, by its turn, will reflect progress and promote the electronic performance of the Government in an unprecedented way. This study followed the descriptive analytical approach, and the researcher concluded that the use of e-government helps in improving the level of services and providing a service to the citizen efficiently, with minimal effort and at the lowest cost. The researcher recommended that all the concerted efforts in the country are to be collectively used in order to establish and implement the e-government project. This includes the need to exchange experiences between countries; the necessity to solve all the problems in terms of shortcomings; the need to eradicate electronic illiteracy; and diffuse and spread the concept and knowledge of information in the society because it has a fundamental role in the success towards the implementation of the e-government system.

Method and Procedures

The study population, sample, and their characteristics are to be carefully determined. It is also necessary to indicate the methods, procedures, and practical steps that were followed in building the study tool, in order to describe them carefully. The methods of maintaining the validity and reliability of the study tool, the methods of designing the study and its variables, and the types of statistical tests that were used in the study, should be clarified by the researchers (Hilgard, 1951; Loftus & Loftus, 2019).

In the current study, the descriptive analytical approach was used to reveal the reality of the application of e-government in the various faculties of the PTUK. The researchers aimed at

investigating the awareness of the university staff regarding the concept of e-government, and the availability of the basic capabilities necessary for the implementation process, as well as the average degree of application. They also aimed to identify the most important obstacles that prevent the application of e-government in the university, and analyse and interpret data to suggest relevant recommendations, based on this reality, to implement e-government at the university.

The Study Sample

This study was applied to faculty members and administrators in the university faculties. The number of questionnaires distributed was 150, and 126 questionnaires were retrieved. The size of the study sample was 150 employees from those who work at the PTUK. The variables studied included and were distributed based on the place of work, years of experience, the nature of work, training courses in the field of e-government, and the necessary technological skills in the field of e-government. The questionnaires were distributed to all groups, in order to achieve the study goals. The study sample was chosen using the random sample method. The following Table 1 describes the study sample, based on its independent variables.

Table 1: Study sample distribution based on its independent variables

Variable	Category	Frequency	Percentage
Place of work	Faculty of Graduate Studies	**2**	**1.6**
	Faculty of Business and Economics	**18**	**14.3**
	Faculty of Engineering and Technology	**15**	**11.9**
	Faculty of Arts and Educational Sciences	**4**	**3.2**
	Faculty of Applied Science	**20**	**15.9**
	Faculty of Agricultural Sciences and Technology	**16**	**12.7**
	Palestine Technical College/Diploma Program	**10**	**7.9**
	Administrative officer	**41**	**32.5**
	Total	**126**	**100**
Years of experience	Less than 5 years	**38**	**30.2**
	Between 6–10 years	**53**	**42.1**
	Between 11–15 years	**20**	**15.9**
	More than 15 years	**15**	**11.9**
	Total	**126**	**100**
Nature of work	Administrative officer	**55**	**43.7**
	Head of Department or Assistant	**11**	**8.7**
	Director or Assistant	**4**	**3.2**
	Faculty member	**52**	**41.3**
	Faculty member/administrative position	**4**	**3.2**
	Total	**126**	**100**
Training courses in the e-government field	Yes	**20**	**15.9**
	No	**106**	**84.1**
	Total	**126**	**100**
Technical skills	Yes	**71**	**56.3**
	No	**55**	**43.7**
	Total	**126**	**100**

Source: Researchers' analysis

Study Tool

The study tool (questionnaire) was built to diagnose the reality of the application of e-government at the PTUK, making use of the questionnaires adopted in a number of previous studies, such as Albashabsheh (2017), and Raba'a (2018). The researchers decided to develop a questionnaire entitled: "The effect of using e-government on improving electronic services at the PTUK". The study tool consisted of two main parts. The first part consisted of

demographic variables that relate to personal data, including the workplace, years of experience at work, the nature of work, training courses in the field of e-government, and the technological skills needed in the field of e-government. The second part consisted of all the questionnaire's 24 paragraphs, which were divided into five main domains. After that, the questionnaire was sent to experts specialised in the field of management and planning to verify and validate the questionnaire's reliability and validity by amending it according to the opinions and recommendations of the arbitrators, and finally adopting the questionnaire in its final form.

Reliability of the Study Tool: The Reliability Coefficient of the Questionnaire

Reliability is defined as the accuracy in the estimate of the individual's true mark on the attribute measured by the test (Sweis et al., 2019). The reliability of the study tool used was measured using the Cronbach alpha equation; it was 0.924 for all items of the questionnaire, and this value indicates that it is suitable for statistical analysis and study purposes.

Study Procedures

Many steps were undertaken to achieve and fulfil the objectives of the current study, such as:

1. Qualifying the questionnaire in its final form.
2. Selecting the study sample.
3. Distributing the questionnaire to the study sample individuals.
4. Collecting the distributed questionnaires, and then tabulating the responses for processing and statistical analysis.

Study Design

Both the descriptive method and the analytical method were used to study the relationship between the study variables, and gather information. The Statistical Package for the Social Sciences (SPSS) was utilised for statistical analysis, examination of the hypotheses, and the interpretation of results. The study included the following two types of variables.

Independent Variables

1. The place of work variable; it has categories or levels.
2. The years of experience variable; it has four categories or levels.
3. The nature of work variable; it has five categories or levels.
4. The variable of training courses in the field of e-government; it has two categories or levels.

5. The technical skills in the field of e-government variable; it has two categories or levels.

Dependent Variables

The dependent variables of the current study were related to the responses to the questionnaire paragraphs or the items that relate to the study of the impact of the use of e-government upon improving the electronic services at the PTUK. In order to process the collected data, the researchers used the SPSS to calculate the following measures: frequencies, means, standard deviations, t-Test for independent variables, One-Way Analysis of Variance (ANOVA), and Alpha Cronbach's coefficient to calculate the reliability coefficient of the questionnaire (Sweis et al., 2019).

Results of the Study

This section deals with answering the study hypotheses and examining them statistically using the SPSS. The main study question is: what is the effect of using e-government upon improving the electronic services at the PTUK? To answer the main study question, the researchers calculated the means, standard deviations, and percentages for all the variables, as shown in Table 2 below.

Table 2: Means and percentages for the infrastructure domain

No.	Statement	Means	Standard Deviations	Percentages
1	There is a database that provides the necessary information about university staff and students.	4.0317	0.78929	80.634
2	There are legislations and legal texts that facilitate the procedures electronically at the university.	3.7302	0.86174	74.604
3	The university has an internal computer network that links all employees and students with each other.	3.9127	0.9035	78.254
4	The number of computers in the university is proportional to the number of employees.	3.7381	0.97307	74.762
	The total domain	3.8532	0.65595	77.064

Source: Researchers' analysis

The results in Table 2 indicate that 80.6 per cent of the respondents reported there is a database that provides the necessary information about employees and students. The

responses also indicate that about 75 per cent of the respondents said there are legislations and legal texts that facilitate the work and the procedures electronically at the university, and that the number of computers in the university is proportional to the number of employees. Furthermore, approximately 78 per cent of the respondents indicated that an internal computer network is available at the university; it was installed to link all employees and students with each other. In general, the study findings showed that using the e-government system affects the improvement of the electronic services at the university, which are manifested in the infrastructure, as 77 per cent of the respondents indicated this.

Table 3: Means and percentages for the knowledge and awareness domain

No.	Statement	Means	Standard Deviations	Percentages
1	There is an awareness among employees about the importance of providing electronic services to students.	3.8571	0.8267	77.142
2	The university provides instructions and courses on how to deal with transactions electronically.	3.5159	1.03332	70.318
3	The university holds seminars and conferences about electronic services for the internal and external community.	3.1984	0.92969	63.968
4	Information about the costs of study credit hours for all majors is available on the university's website.	3.8413	0.89811	76.826
5	The university publishes sufficient information for students about electronic services through the media.	3.5873	0.90571	71.746
	The total domain	3.6	0.69788	72

Source: Researchers' analysis

The results in Table 3 above show that about 77 per cent of the respondents indicated that there is an awareness among university employees about the importance of providing electronic services to students. Furthermore, about 64 per cent of the respondents said that the university holds seminars and conferences on electronic services for the internal and external community. The results also show that about 70 per cent of the respondents said that the university provides instructions and training courses on how to deal with transactions electronically. In general, it was found that the use of e-government affects the improvement of the electronic services at the university. This is clearly manifested in the domain of knowledge and awareness, especially because 72 per cent of the respondents indicated this.

Table 4: Means and percentages for the communication network (Internet) domain

No.	Statement	Means	Standard Deviations	Percentages
1	The steps of the electronic services at the university are clear.	3.7619	0.80427	75.238
2	Electronic information saves time and effort in completing electronic services.	3.9444	0.8324	78.888
3	The use of electronic information clearly reduces costs compared to paperwork.	3.9524	0.80853	79.048
4	There is an increasing demand for students to deal with electronic services.	3.8254	0.79074	76.508
5	There is a media interest in the university's online services, in order to achieve quality requirements.	3.4921	0.77713	69.842
	The total domain	3.7952	0.55568	75.904

Source: Researchers' analysis

The results in Table 4 indicate that 79 per cent of the respondents agreed that the use of electronic information clearly reduces the costs in comparison with paperwork transactions. Meanwhile, 70 per cent of the respondents maintained that the local media shows an interest in the university's electronic services, in a way that helps achieve quality demands. Furthermore, the results also show that 75 per cent of the respondents indicated that the steps of using the electronic services in the university are clear. In general, the researchers found that the use of e-government affects improving the electronic services in the university, and this was represented in the communication network, which was indicated by about 76 per cent of the respondents.

Table 5: Means and percentages for the work of ministries and agencies domain

No.	Statement	Means	Standard Deviations	Percentages
1	There is a specialised department to supervise electronic information at the university.	3.784	0.83843	75.68
2	Staff are trained in the procedures for providing electronic services.	3.448	0.89313	68.96
3	The university website serves students properly and easily.	3.6825	0.84523	73.65
4	Employees are encouraged to come up with new ideas about the possibility of developing various services electronically.	3.2698	0.98316	65.396
5	Students' satisfaction with the online services provided is constantly measured.	3.2063	0.92362	64.126
	The total domain	3.4782	0.63695	69.564

Source: Researchers' analysis

The results in Table 5 indicate that about 76 per cent of the respondents said that there is a specialised department to oversee electronic information at the university. Moreover, about 64 per cent of the respondents argued that the extent of students' satisfaction with the electronic services provided is constantly measured. The results also indicate that about 69 per cent of the respondents stated that they are training university staff and employees on the procedures for providing electronic services. In general, the researchers found that the use of e-government affects the improvement of the electronic services at the university, which is represented in the work of the ministries and agencies, as indicated by about 69.56 per cent of the respondents.

Table 6: Means and percentages for the human competency domain

No.	Statement	Means	Standard Deviations	Percentages
1	The employees are trained to handle and deal with the electronic information system periodically.	3.4921	0.93591	69.842
2	All employees have the ability to handle and use computers.	3.5	0.89219	70
3	Employees can handle electronic transactions quickly.	3.4683	0.94392	69.366
4	Technical and diagnostic assistance services are available around the clock.	3.3333	0.95499	66.666
5	Students can monitor their academic affairs electronically.	3.8095	0.90079	76.19
	The total domain	3.5206	0.64601	70.412

Source: Researchers' analysis

The results in Table 6 indicate that 76.19 per cent of the respondents said that students can monitor their academic affairs electronically, and that about 70 per cent of the respondents indicated that all employees possess the ability to handle and use computers. Furthermore, 67 per cent of the respondents indicated that technical and diagnostic assistance services are available to employees around the clock. In general, the researchers found that the use of e-government affects the improvement of the electronic services at the university, which is represented in the work of the ministries and bodies, as about 70.4 per cent of the respondents indicated this.

Table 7: Means and percentages for all domains

No.	Domain	Means	Standard Deviations	Percentages
1	Infrastructure	3.8532	0.65595	77.064
2	Knowledge and awareness	3.6	0.69788	72
3	Communication network (Internet)	3.7952	0.55568	75.904
4	Ministries and agencies work	3.4782	0.63695	69.564
5	Human competency	3.5206	0.64601	70.412
	The total domain	3.6494	0.53371	72.988

Source: Researchers' analysis

The results of Table 7 indicate that the most important domain related to the improvement of the electronic services affected by the use of e-government is the domain of infrastructure, as 77 per cent of the respondents indicated this. However, the least affected domain, in terms of

the improvement of services affected by the use of e-government, is the ministries and agencies, with 69 per cent of the respondents indicating this.

Test Hypothesis

First Hypothesis

There were no statistically significant differences at the level of significance ($\alpha = 0.05$) in the effect of using e-government upon improving the electronic services attributed to the variable of the place of work in the university.

In order to test this hypothesis, means (arithmetic averages), and standard deviations were calculated for the effect of using e-government upon improving the electronic services based on the variable of the workplace in the university. The results showed that there were differences in the mean for the effect of using e-government upon improving the electronic services which were attributed to the variable of the place of work in the university. To test whether these differences were statistically significant, an ANOVA test was used, and the results are shown in Table 8.

Table 8: Results of ANOVA for the significance of the differences for the means of the effect of using e-government upon improving the electronic services attributed to the variable of the place of work in the university

Variable / Domains	Source of variance	Degrees of freedom	Standard deviation	Means	F-test	Sig.
Infrastructure	Between groups	7	4.154	0.593	1.411	0.207
	In groups	118	49.630	0.421		
	Total	125	53.784			
Knowledge and awareness	Between groups	7	2.616	0.374	0.757	0.625
	In groups	118	58.264	0.494		
	Total	125	60.880			
Communication network (Internet)	Between groups	7	3.975	0.568	1.935	0.070
	In groups	118	34.622	0.293		
	Total	125	38.597			
Ministries and agencies work	Between groups	7	3.367	0.481	1.199	0.309
	In groups	118	47.345	0.401		
	Total	125	50.712			
Human competency	Between groups	7	2.041	0.292	0.687	0.683
	In groups	118	50.125	0.425		
	Total	125	52.166			
The total domain	Between groups	7	2.173	0.310	1.095	0.371
	In groups	118	33.433	0.283		
	Total	125	35.606			

Source: Researchers' analysis

It is clear from Table 8, that there are no statistically significant differences at the level of significance ($\propto = 0.05$) for the impact of the use of e-government upon improving the electronic services at the PTUK, which were attributed to the place of work on all fields of study, as well as on the total field. The calculated level of significance for these domains and the total domain is higher than the level of significance determined by the hypothesis. This indicates that there is no difference in the views of the respondents, which were based on the place of work in the university and regarding the impact of the use of e-government upon improving the electronic services at the PTUK.

Second Hypothesis

There were no statistically significant differences at the level of significance ($\alpha = 0.05$) in the effect of using e-government upon improving the electronic services attributed to the variable of the years of experience.

In order to test this hypothesis, means (arithmetic averages), and standard deviations were calculated for the effect of using e-government upon improving the electronic services based on the variable of years of experience. The results showed that there were differences in the mean for the effect of using e-government upon improving the electronic services attributed to the variable of the years of experience. To test whether these differences are statistically significant, an ANOVA test was used, and the results are shown in Table 9.

Table 9: Results of ANOVA for the significance of the differences for the means of the effect of using e-government upon improving the electronic services attributed to the variable of years of experience

Variable / Domains	Source of variance	Degrees of freedom	Standard deviation	Means	F-test	Sig.
Infrastructure	Between groups	3	1.131	0.377	0.873	0.457
	In groups	122	52.653	0.432		
	Total	125	53.784			
Knowledge and awareness	Between groups	3	1.515	0.505	1.038	0.378
	In groups	122	59.365	0.487		
	Total	125	60.880			
Communication network (Internet)	Between groups	3	0.686	0.229	0.736	0.532
	In groups	122	37.911	0.311		
	Total	125	38.597			
Ministries and agencies work	Between groups	3	0.404	0.135	0.326	0.806
	In groups	122	50.309	0.412		
	Total	125	50.712			
Human competency	Between groups	3	1.841	0.614	1.487	0.221
	In groups	122	50.326	0.413		
	Total	125	52.166			
The total domain	Between groups	3	0.869	0.290	1.018	0.387
	In groups	122	34.736	0.285		
	Total	125	35.606			

Source: Researchers' analysis

It is clear from Table 9, that there are no statistically significant differences at the level of significance ($\propto = 0.05$) for the impact of the use of e-government upon improving the electronic services at the PTUK, which were attributed to the years of experience on all fields of study, as well as on the total field. The calculated level of significance for these domains and the total domain is higher than the level of significance determined by the hypothesis. This indicates that there is no difference in the views of the respondents based on the years of

experience and regarding the impact of the use of e-government upon improving the electronic services at the PTUK.

Third Hypothesis

There were no statistically significant differences at the level of significance ($\alpha = 0.05$) in the effect of using e-government upon improving the electronic services attributed to the variable of the nature of work.

In order to test this hypothesis, means (arithmetic averages), and standard deviations were calculated for the effect of using e-government upon improving the electronic services based on the variable of the nature of work. The results showed that there were differences in the mean for the effect of using e-government upon improving the electronic services attributed to the variable of the nature of work. To test whether these differences are statistically significant, an ANOVA test was used, and the results are shown in Table 10.

Table 10: Results of ANOVA for the significance of the differences for the means of the effect of using e-government upon improving the electronic services attributed to the variable of the nature of work

Variable / Domains	Source of variance	Degrees of freedom	Standard deviation	Means	F-test	Sig.
Infrastructure	Between groups	3	1.131	0.377	0.873	0.457
	In groups	122	52.653	0.432		
	Total	125	53.784			
Knowledge and awareness	Between groups	3	1.515	0.505	1.038	0.378
	In groups	122	59.365	0.487		
	Total	125	60.880			
Communication network (Internet)	Between groups	3	0.686	0.229	0.736	0.532
	In groups	122	37.911	0.311		
	Total	125	38.597			
Ministries and agencies work	Between groups	3	0.404	0.135	0.326	0.806
	In groups	122	50.309	0.412		
	Total	125	50.712			
Human competency	Between groups	3	1.841	0.614	1.487	0.221
	In groups	122	50.326	0.413		
	Total	125	52.166			
The total domain	Between groups	3	0.869	0.290	1.018	0.387
	In groups	122	34.736	0.285		
	Total	125	35.606			

Source: Researchers' analysis

It is clear from Table 10, that there are no statistically significant differences at the level of significance ($\propto = 0.05$) for the impact of the use of e-government upon improving the electronic services at the PTUK, which were attributed to the nature of work on all fields of study, as well as on the total field, except for the communication network variable. The calculated level of significance for this domain (communication network) is 0.006, and this value is less than ($\propto = 0.05$), the level of significance determined by the hypothesis. This indicates that there is a statistically significant difference in the views of the respondents based on the nature of work regarding the impact of the use of e-government upon improving the electronic services at the PTUK. However, the calculated level of significance for the other domains and the total domain is higher than the level of significance determined by the hypothesis. This indicates that there is no difference in the views of the respondents based on the nature of work regarding the impact of the use of e-government upon improving the electronic services at the PTUK. In order to clarify the differences that appeared, the Least Significant Difference (LSD) test was used, and the results are shown in Table 11.

Table 11: Results of the LSD for the communication network

Nature of work (I)	Nature of work (J)	Mean difference (I-J)	Sig.
Administrative officer			
	Faculty member	0.36084*	0.001
Director or Assistant	Faculty member	0.61538*	0.028

Source: researchers' analysis

It is clear from the results of Table 11, that there are differences between the faculty members and administrative officers regarding the field of the communication network. There are also differences within this field between the Director or Assistant, and the faculty members. In both cases, we find that the calculated level of significance is 0.001, and 0.028, respectively. These two values are less than 0.05, and the results showed that these differences are in favour of the administrative officer, in the first case, and in favour of the Director or Assistant in the second.

Fourth Hypothesis

There were no statistically significant differences at the level of significance ($\alpha = 0.05$) in the effect of using e-government upon improving the electronic services attributed to the variable of training courses.

In order to test this hypothesis, means (arithmetic averages), and standard deviations were calculated for the effect of using e-government upon improving the electronic services based on the variable of training courses. The results showed that there were differences in the means for the effect of using e-government upon improving the electronic services attributed to the variable of training courses. To test whether these differences are statistically significant, a t-Test was used, and the results are shown in Table 12.

Table 12: t-Test for independent variables on all domains and the total domain based on training courses variable

Domain	Yes (n= 20)		No (n= 106)		t-test	Sig.
	Means	Standard Deviations	Means	Standard Deviations		
Infrastructure	4.2000	0.55370	3.7877	0.65537	2.639	0.009
Knowledge and awareness	3.8200	0.71936	3.5585	0.68936	1.546	0.125
Communication network (Internet)	4.0600	0.58436	3.7453	0.53845	2.365	0.020
Ministries and agencies works	3.8700	0.68756	3.4042	0.60222	3.101	0.002
Human competency	3.7600	0.60385	3.4755	0.64643	1.823	0.007
The total domain	3.9420	0.56237	3.5942	0.51234	2.741	0.071

Source: Researchers' analysis

It is clear from the results of Table 12 that there are differences in the means between those who have training courses in the field of e-government, and those who do not. The results of the testing for independent variables shows that these differences are statistically significant for all the domains of the study, except for the knowledge and awareness domain, and the total domain, as there are no statistically significant differences because the calculated significance for these fields is greater than 0.05. This indicates that there is no difference in the respondents' views on the effect of e-government use upon improving the quality of the electronic services at the PTUK. However, the level of significance calculated for the remainder of domains is less than 0.05. This indicates a difference in the views between the respondents regarding the effect of using e-government in improving the quality of the electronic services at the PTUK.

Fifth Hypothesis

There were no statistically significant differences at the level of significance ($\alpha = 0.05$) in the effect of using e-government upon improving the electronic services attributed to the variable of the technical skills required.

In order to test this hypothesis, means (arithmetic averages), and standard deviations were calculated for the effect of using e-government upon improving the electronic services based on the variable of the technical skills required. The results showed that there were differences in the means for the effect of using e-government upon improving the electronic services

attributed to the variable of the technical skills required. To test whether these differences are statistically significant, a t-Test was used, and the results are shown in Table 13.

Table 13: t-Test for independent variables on all domains and the total domain based on the technical skills required variable

Domain	Yes (n= 20)		No (n= 106)		t-test	Sig.
	Means	Standard Deviations	Means	Standard Deviations		
Infrastructure	**3.9754**	**0.60379**	**3.6955**	**0.69170**	**2.421**	**0.017**
Knowledge and awareness	**3.5859**	**0.66790**	**3.6182**	**0.74064**	**-0.256**	**0.798**
Communication network (Internet)	**3.8169**	**0.53103**	**3.7673**	**0.58974**	**0.496**	**0.621**
Ministries and agencies work	**3.5070**	**0.65625**	**3.4409**	**0.61509**	**0.576**	**0.565**
Human competency	**3.5070**	**0.63681**	**3.5382**	**0.66318**	**-0.267**	**0.790**
The total domain	**3.6785**	**0.51375**	**3.6120**	**0.56097**	**0.692**	**0.490**

Source: Researchers' analysis

It is clear from the results of Table 13, that there are differences in the means between those who have the required technical skills in the field of e-government, and those who do not. The results of the testing for the independent variables shows that these differences are statistically significant for the infrastructure domain only, because the calculated level of significance for this domain is less than 0.05. This indicates that there are differences in the views of the respondents for the effect of using e-government upon improving the performance of the electronic services based on the technical skills variable. However, there are no statistically significant differences in the remainder of domains, as well as the total domain because their respective calculated significance is greater than 0.05. This indicates that in these domains, there is no difference in the respondents' views on the effect of e-government use upon improving the quality of the electronic services at the PTUK, as attributed to the required technical skills.

Results

This study has concluded that:

1. The researchers of the current study intended to confirm there is a database that provides the necessary information about employees and students (80.6 per cent), and that there are legislations and legal texts that facilitate the work and the procedures

electronically at the university. Furthermore, the number of computers in the university is proportional to the number of employees, as stated by 75 per cent of the respondents. These results are closely consistent with a study conducted by Albashabsheh (2017).

2. Seventy-eight per cent of the study sample indicated that the university has an internal computer network that connects all employees and students with one another. This is consistent with the study by Albashabsheh (2017). It also showed that the use of e-government affects the improvement of the electronic services at the university. This is clearly manifested in the infrastructure, as 77 per cent of the respondents argued.

3. The study revealed that 77 per cent of the respondents indicated that there is an awareness among employees about the importance of providing electronic services to students. This is also consistent with the studies of Albashabsheh (2017), and Raba'a (2018). The researchers also revealed that about 64 per cent of the respondents said the university holds training courses, seminars, and conferences for the internal and external community on electronic services.

4. The study showed that 70 per cent of the respondents said the university provides guidance and training courses on how to deal with transactions electronically. In general, the researchers found that the use of e-government affects the improvement of the electronic services at the university. This is evident in the domain of knowledge and awareness, as 72 per cent of the respondents indicated. Such results are consistent with Albashabsheh (2017), and Raba'a (2018).

5. The study confirmed that 79 per cent of the respondents said that the use of electronic information clearly reduces the costs in comparison with paperwork and transactions. About 70 per cent of the respondents said there is a media interest in the university's electronic services that aim to achieve quality demands. Furthermore, about 75 per cent of the respondents said that steps followed in the electronic services at the university are generally clear, and that the use of e-government affects the improvement of the electronic services at the university, as shown in the communication network domain.

6. The study revealed that 76 per cent of the respondents said there is a specialised department to monitor and observe the electronic information at the university. About 64 per cent of the respondents said the extent of students' satisfaction with the electronic services provided is measured. The researchers found that 69 per cent of the respondents indicated that employees are trained in procedures related to providing electronic services. In general, it was found that the use of e-government affects the

improvement of the electronic services at the university, as shown in the work of the ministries and agencies domain, and as 69.56 per cent of the respondents stated.

7. The study showed that 76.19 per cent of the students can follow their academic affairs electronically. About 70 per cent of the respondents indicated that all employees possess the ability to deal with and use computers. About 67 per cent of the respondents indicated that technical and diagnostic assistance services are available for employees around the clock. In general, the use of e-government affects the improvement of the electronic services at the university, as shown in the work of the ministries and agencies, and as indicated by 70.4 per cent of respondents.

8. The study revealed that the most influenced area of improvement of electronic services affected by the use of e-government is the domain of infrastructure, as indicated by 77 per cent of respondents. However, the least affected area is the ministries and agencies, as indicated by 69 per cent of respondents.

During the research process, a set of obstacles emerged that impeded the establishment of e-government in the Arab countries. They included weak infrastructure in the field of communications and information; the risks to which the e-government is exposed through the Internet, such as electronic piracy, which is clearly manifested in and represented by data obfuscation, vandalism, misrepresentation, divulging the secrets of beneficiaries, and penetrating government and individual websites; and the absence of legislations and judicial systems in the electronic field (Abu-Shanab, 2020). Mohammed (2018) adds there are numerous challenges faced in the establishment of e-government in the Arab countries, including the high financial cost of using the Internet, a lack of confidence by some users in electronic transactions, frequent malfunctions of the communication network, and a weak social awareness towards the importance of transformation through the use of e-government.

Recommendations

Based on the research results, the researchers recommend:

1. The work of ministries and agencies needs further development and improvement by finding specialised agencies to observe and oversee data and information.

2. Knowledge and awareness about e-government programs related to educational services can be increased through holding educational courses and programs that include students and administrative officers, as well as academic staff. It can be also increased by holding seminars and conferences, and broadcasting them to the public via various media outlets.

3. The capacity of the infrastructure and human efficiency should be increased to keep pace with providing the required services. This can be done by allocating a special budget to the authorities supervising the e-government project, which plays an important role in the development of the education sector in Palestine.

4. Communication networks at the university are to be developed and constantly renovated.

5. Further studies are required on e-government programs in the educational sector, especially in universities in the West Bank, which should be carried out constantly.

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