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Abstract

It is worth mentioning that the use of instructional technology in particular affects positively the students' content acquisition. As well, it plays a great role in enhancing the class performance (Baylor and Ritchie, 2002). For instance, Beggs (2000), states that the use of technology itself in education is not the big point or the main issue. Instead of that he focuses on using it in an effective way that leads to the advancement of learning and meets the students' interests and abilities. However, if we compare today's' modern life with the past, we will find out that in the past people didn't use to be familiar with the use of technologies especially in the field of teachers training at the Palestinian traditional universities. In other words, the traditional universities in Palestine suffer from a lack of enough awareness and suitable infrastructure in employing the technology in education. The study comes out to highlight and clarify in what manner business teachers employed instructional technologies at these universities. As well, it provides a clear distinction between teachers who employed the modern technology and between the traditional ones who were described as reluctant and worked against adopting the IT in education. Moreover, it determines whether the characteristics of business teachers participates in the prediction of teachers adopter groupings.

Keywords: Technology adoption, diffusion of innovation, adopter categories, business teachers, technology use.

Introduction

There is no doubt that in the recent years, the traditional universities in Palestine appears to be more interested in employing the IT and aware the importance of adopting it as a main base of their columns. Hence, they invested widely to support the use and adoption of technology by creating the required infrastructure of the IT field (Green, 1999; Jacobsen, 2000). Though, even with this huge investment in technology by these universities, the instructional technology has not been adopted by the institutions of business education as required yet (Geoghegan, 1994; Spotts, 1999; Surry, 1997; Albright, 1996; Carlile and Sefton, 1998). However, there are technical and societal reasons clarify why modern technologies have not been adopted in a comprehensive way. Hence, the main factor behind this failure of using IT reasonably appears to be that most of university level-technology strategies do not take into account the fundamental role that must be initiated by the faculty for the sake of the process of change (Surry and Land, 2000).

The Association for Educational Communications and Technology (AECT) has defined instructional technology (IT) as a complex, integrated process involving people, procedures, ideas, devices and organizations, for analyzing problems and devising, implementing, evaluating and managing solutions to those problems involved in all aspects of human learning (Seels and Richey, 1994). Despite the AECT definition of IT, in which the emphasis is on IT rather than its' products, many of the debates regarding the use of technology in education continues to focus on products: computers, software, networks and instructional resources (Green, 2000). Certainly, the use of an adequate technology infrastructure is a prerequisite of IT integration, but the major challenge is to encourage the faculty to adopt these technologies once they are made available. Goeghegan (1994) expresses this challenge as follows: One of the most basic reasons underlying the limited use of instructional technology is the failure to recognize and deal with the social and psychological dimension of technological innovation and diffusion**:** the constellation of academic and professional goals, interest, and needs, technology interest, patterns of work, sources of support, social networks, etc., that play a determining role in faculty willingness to adopt and utilize technology in the classroom. Adoption of or hesitation to adopt new instructional technologies by the business teachers involves a complex system involving multiple variables. As stated by (Spotts, 1999) "the reality of instructional technology use is in the relationship between the new

instructional technologies and the faculty members' individual and organizational context and their personal histories".

Conceptual Framework

There have been many attempts to understand patterns of adoption in education. The researcher present one such model in simplified form in order to better understand both traditional and contemporary applications of instructional technology in education. The model, as illustrated in Figure 1, has five phases. The full potential of any educational technology can only be realized when educators progress through all five phases, otherwise, the technology will likely be misused or discarded (Rieber and Welliver, 1989; Marcinkiewicz, in press, 1991). The *traditional* role of technology in education is necessarily limited to the first three phases, whereas *contemporary* views hold the promise to reach the Evolution phase.

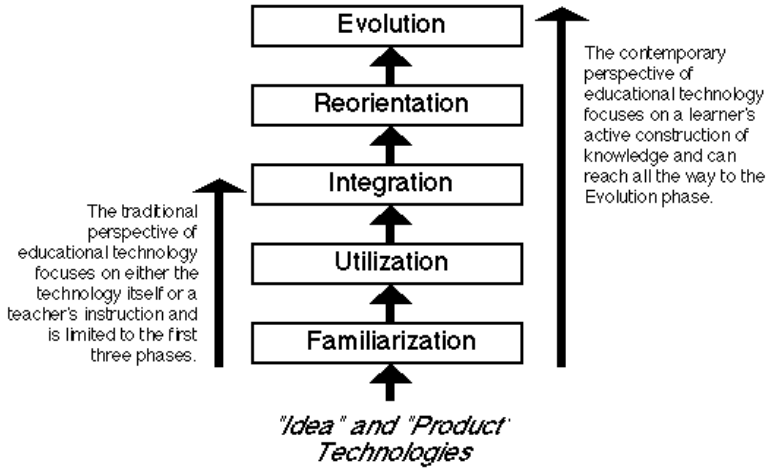

Figure 1. Model of adoption of both "idea" and "product" instructional technologies in education

Study Model

Presented below is the Model of the study based on previous studies that implemented internationally.

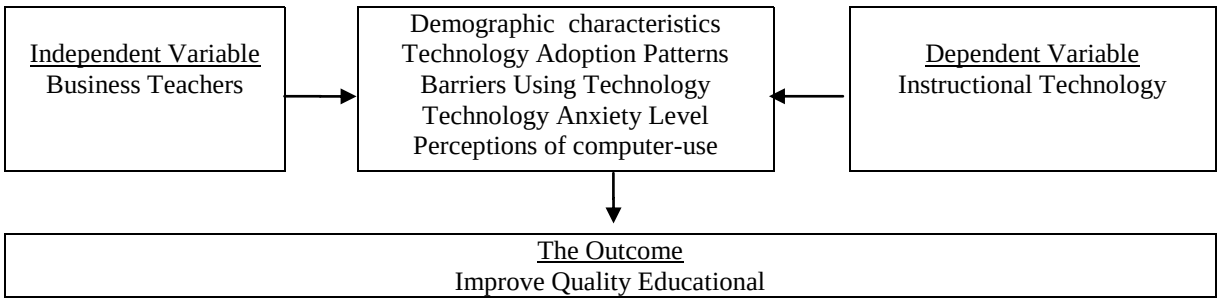

Figure 2. The model of the study - researcher constructed

Study Questions

This study addressed business teachers' use of technology in their instruction, the results should contribute to efforts to enable the instructional use of technology to achieve its maximum possible impact, the research questions were: 1. What are the personal and demographic characteristics of business teachers. 2**.** To what extend have business teachers adopted technology for use in their instruction. 3. What barriers exist that may prevent business teachers from using technology in their teaching. 4. Do business teachers experience technology anxiety when attempting to use technology in instruction. 5. Do selected variables explain a significant proportion of the variance in teachers' technology adoption? For the purposes of the study, technology was defined as "high-tech media utilized in instruction such as computers, e-mail, Internet, list-serves, CDROM, software, laser disc players, interactive CD, digital cameras, scanners, digital camcorders, etc."

Method

The present investigation surveyed business teachers in traditional university Palestine. Information gathered about technology use patterns, computer experience and use of technology for teaching, perceived computer use self-efficacy, perceived value of IT, perceived incentives, and barriers. Survey items were adopted or selected from previous investigations of faculty adoption patterns (Anderson, Varnhagen, and Campbell, 1999; Jacobsen, 1998**)** and Microcomputer Utilization in Teaching Self-Efficacy Beliefs Scale **(**Enochs, Riggs, and Ellis, 1993**)**. The survey distributed to 105 business teachers and complete data obtained from 105. 100% participants 98% male and 2% female, holding various academic ranks 5% professors, 7% Associate Professors, 35% Assistant Professor and 53% others, having an average of 10 years of teaching experience. While the average age was 41 years, the largest group 55% was in the 31- 40 age groups.

Table 1. Survey participation percentage

No.	Traditional Universities	No. of Faculty	No. participated	Participation %
1	Arab American University	33	9	8%
2	Hebron University	11	3	3%
3	Palestine Polytechnic University	23	6	6%
4	An-Najah National University	55	14	13%
5	Palestine Technical University Kadoori	43	12	11%
6	Birzeit University	50	13	12%
7	Bethlehem University	12	3	3%
8	Al-Quds University	24	5	5%
9	Al-Istiqlal University	27	7	6%
10	Al-Azhar University	24	5	5%
11	Islamic University Gaza	64	16	15%
12	Al-Aqsa University	29	6	6%
13	Gaza University	12	3	3%
14	Palestine University	14	3	3%
	Total	421	105	100%

Instrumentation

The instrument contained three scales: technology adoption for use in instruction (15 items), barriers to technology integration in instruction (7 items), and technology anxiety experienced while attempting to use technology in instruction (9 items). All scales and other items used in the instrument developed by the researcher after a review of related research literature. The face and content validity of the instruments evaluated by an expert panel of university teachers. The instruments were pilot tested with career and technical education teachers. The reliability of the three scales calculated using Cronbach's alpha: technology adoption, $\alpha = .98$, barriers, $\alpha = .84$, and technology anxiety, $\alpha = .98$. All scales possessed exemplary reliability according to the standards for instrument reliability for Cronbach's alpha by (Robinson, Shaver and Wrightsman, 1991).**Table 2** Analysis of Scale Means for Responses Received from business teachers via Mail versus Responses Received via Telephone Follow-up.

Table 2. Analysis of scale means for responses received from business teachers

Scale	Mail Respondents	Telephone Follow-up Respondents	Levene's Test for Equality Variances				
	m (n/sd)	m (n/sd)	F	p	t	df	p
Technology Adoption [a]	3.67 (69/1.13)	3.78[b] (35/.99)	.95	.33	-.39	47.45	.70
Barriers to Technology Integration	2.03 (66/.67)	2.06[c] (35/.60)	.65	.42	-.19	62	.85
Technology Anxiety	1.91 (67/1.01)	2.07[d] (35/.85)	.77	.38	-.64	63	.52

Notes: [a] Equal variances were not assumed for the t-test for technology adoption because the Levene's Test for Equality of Variances resulted in a statistically significant F value. [b] Technology Adoption Scale: 1 = Not Like Me, 2 = Very Little Like Me, 3 = Some Like Me, 4 = Very Much Like Me, 5 = Just Like Me. [c] Barriers to Technology Integration Scale: 1 = Not a Barrier, 2 = Minor Barrier, 3 = Moderate Barrier, 4 = Major Barrier. [d] Technology Anxiety Scale: 1 = No Anxiety, 2 = Some Anxiety, 3 = Moderate Anxiety, 4 = High Anxiety, 5 = Very High Anxiety.

Variables Related to Technology Adoption

Technology Adoption Barriers

Eminent authors have been illustrated the main obstacles that lead to weaken the process of technology adoption. For instance, Brinkerhoff (2006) illustrates that teachers often are not able to build on technology's instructional potential. This matter of fact relates to barriers such as institutional and administrative support, training and experience, attitudinal or personality factors, and resources as well. Thus, these obstacles are defined as ". . . any factor that prevents or restricts teachers' use of technology in the classroom". In relation to this issue, the British Educational Communications and Technology Agency (BECTA, 2003, 1) states that teacher-level barriers consist of the following factors: lack of time, lack of necessary knowledge, as well as the lack of self-confidence in using technology. However, barriers that surround the administrative level are the lack of: technical support, access to equipment, availability of up to-date software, and institutional support too. On the first hand, BECTA ,2003, (Redmann and Kotrlik, 2004, and Mumtaz, 2000)clarify that technology unavailability comes to be marked as an important element deterring the use of technology by teachers. On the second hand, (Park andErtmer,2008) adds that". . . a lack of a clear, shared vision was the primary barrier. Hence, other barriers may include the lack of sufficient knowledge and skills, unclear expectations, and insufficient feedback".

Technology Anxiety

Technology anxiety has resulted from equipping teachers with technology but failing to provide appropriate teacher training or to consider curricular issues (Budin, 1999). Technology anxiety has been found to explain variation in technology adoption by career and technical education teachers (Redmann and Kotrlik, 2004) concluded that technology adoption increased as technology anxiety decreased.

Technology Training and Availability

Vannatta and Fordham (2004) found that the amount of technology training was one of the best predictors of technology use. However, it is interesting to note that BECTA (2003) reported that training is focused on teaching basic skills rather than addressing the integration of technology in the classroom. Regarding technology availability, (Mumtaz, 2000and BECTA ,2003) found that a lack of technology availability was a key factor in preventing teachers from using technology in their instruction.

Gender

Anderson (1996) reported in his analysis of studies of computer anxiety and performance that several studies concluded gender was a significant factor in explaining differences in computer anxiety and attitudes toward computers, while other studies found that no relationships existed. (Kotrlik, Redmann, Harrison, and Handley, 2000) found that gender did not explain any variance in the value placed on information technology by agriscience teachers.

Age and Teaching Experience

Waugh (2004) concluded that technology adoption decreased as age increased. In regard to teaching experience, Mumtaz (2000) reported that a lack of teaching experience with technology was a factor that resulted in teachers avoiding the use of technology and an NCES study (Smerdon et al., 2000) reported that more experienced teachers were less likely to utilize technology than less experienced teachers.

Background of the Higher Educational Institutions in Palestine

Table 3 summarizes facts of the Palestinian higher education institutions for the academic years (2014/2015 - 2015/2016). These material facilitated researcher's conceptualization of the study.

Table 3. The higher educational institutions

	Traditional Universities		Open University		University Colleges		Community Colleges		Total	
	14/15	15/16	14/15	15/16	14/15	15/16	14/15	15/16	14/15	15/16
Higher Educational Institutions										
West Bank	9	9	0	0	13	12	11	12	33	33
Gaza Strip	5	5	0	0	6	5	7	6	18	18
Total	14	14	1	1	19	17	18	18	52	51
New Student: 56,969 = Female 33,292 and Male 23,677										
PhD	28	1	0	0	0	0	0	0	28	1
Master	2,776	2.292	0	0	0	0	0	0	2,776	2.292
Higher Diploma	103	79	0	0	0	0	0	0	103	79
Bachelor	31,422	29,819	11,302	9,801	1,870	2,040	0	33	44,594	41,693
Diploma2 years	1,265	1,373	0	0	4,718	3,577	5,770	4,463	11,753	9,413
Others	621	312	2,495	3,114	84	65	0	0	3,200	3,491
Total	36,215	33,876	13,797	12,915	6,672	5,682	5,770	3,491	62,454	56,969
Enrolled Student: 216,028 = Female 130,843 + Male 85,185										
PhD	40	45	0	0	0	0	0	0	40	45
Master	7,751	6,896	0	0	0	0	0	0	7,751	6,896
Higher Diploma	194	242	0	0	0	0	0	0	194	242
Bachelor	121,008	120,994	57,405	54,316	5,903	6,074	0	175	184,316	181,559
Diploma2 years	2,624	3,538	0	0	10,431	9,208	12,206	10,379	25,261	23,125
Others	832	633	2,825	3,379	112	140	64	9	3,833	4,161
Total	132,449	132,348	60,230	57,695	16,446	15,442	12,270	10,563	221,395	216,028
Academicians: 7,011										
Prof	215	282	19	19	5	3	2	5	241	309
Associate Prof	367	387	52	58	8	7	0	1	427	453
Assistant Prof	1,416	1,465	327	306	81	89	13	13	1,837	1,873
Lecturer	566	574	80	93	184	353	123	261	953	1,281
Instructor	1,273	1,435	807	961	17	190	279	175	2,376	2,761
Others	0	66	0	19	357	227	30	22	387	334
Total	4,303	4,209	1,431	1,456	949	869	447	477	7,130	7,011

The traditional universities for the Academic Year - 2015/2016 are given in Table 4:

Table 4. The traditional universities in Palestine

No.	Traditional Universities	Professor	Asso. Prof	Assi. Prof	Others	Total
1	Arab American University	2	3	12	16	33
2	Hebron University	0	2	01	08	11
3	Palestine Polytechnic University	0	0	11	12	23
4	An-Najah National University	2	2	20	31	55
5	Palestine Technical University Kadoori	0	1	16	26	43
6	Birzeit University	1	2	18	29	50
7	Bethlehem University	0	0	03	09	12
8	Al-Quds University	0	1	08	15	24
9	Al-Istiqlal University	0	0	16	11	27
10	Al-Azhar University	5	7	07	05	24
11	Islamic University Gaza	9	6	16	33	64
12	Al-Aqsa University	0	0	10	19	29
13	Gaza University	0	1	04	07	12
14	Palestine University	1	1	05	07	14
	Total	20	26	147	228	421

Diffusion of Innovations

Rogers' (1995) provided a rare conceptual framework for analyzing faculty adoption of technology patterns in which it has been provided by the theory of the diffusion of innovations. He states that diffusion is the process of communicated an innovation through definite channels among the members of a social system over time. Also, he states that an innovation is an idea, practice or object that is thought to be new by the individuals. Thoroughly, he explains that diffusion is described as the process of how an innovation indulges with the social system. In relation to the purpose of this study, innovation is defined as an instructional technology that targets teaching and learning. Whereas, diffusion is defined as the extent to which faculties have adopted these innovations.

However, *innovativeness* is explained as the degree to which an individual is relatively earlier in adopting new ideas than other members of a system. This becomes a matter of fact because entities and individuals in the social system do not adopt an innovation at the same time. Similarly, Rogers (1995) indicates five adopter categories alongside the continuum of *innovativeness*. These categories are *ideal types* that have been designed so as to make possible comparisons that are based on characteristics of the typical distribution and divided by both the mean deviation and standard deviation. Hence, the respondents of this study were given to either the earlier adopter (i.e., innovators + early adopters = EA) or mainstream faculty (early + late majority + laggards = MF) subgroups by employing a scoring procedure that iscreated by Anderson, Varnhagen, and Campbell (1997). Similar study of faculty adoption patterns by Rogers' demonstrates that Innovator Bell Curve is (2.5%), Early Adopter is (13.5%), Early Majority is (34%), Late Majority is (34%), and Laggards is(16%) as explained in (Figure 3).

Figure 3. Adopter Categorization based on Innovativeness (Rogers, 1995)

Some of the differences that have been cited separating early adopters from the mainstream include:

Differences between Early Adopters from the Mainstream

No	Early Adopters	No	Mainstream
1	Favor revolutionary change	1	Favor evolutionary change
2	Visionary	2	Conservative
3	Strong technology focus	3	Problem oriented
4	Risk takers	4	Risk Averters
5	Experimenters	5	Want proven applications
6	Generally self-sufficient	6	May need significant support
7	Horizontally connected	7	Vertically connected

The differences between people who fall into Rogers' Early Adopter and Early Majority categories create gaps in motivation, expectations and needs. The literature on individual characteristics of the faculty indicated that

early adopters of instructional technology share common characteristics such as higher perceptions of efficacy and expertise **(**Anderson, Varnhagen and Campell, 1999; Jacobsen, 1998; Lichty, 2000; Oates, 2001**)**, risk taking and experimentation (Oates, 2001), positive attitude toward technology (Spott, 1999**)** and personal interest in technology **(**Oates, 2001).

Results and Discussion

Question 1: Personal and Demographic Characteristics

The survey of this study has been distributed to 105 faculty members. In which all of the distributed forms have been given back. The complete obtained data forms are105. The survey shows that the gender of respondents is mostly males, (103 out of 105) are males. Statistically, teachers shaped 98% male of the respondents. In contrast, the survey includes only 2 females (2%).It also shows that the respondents hold different academic ranks. For instance, 5% professors, 7% Associate Professors, 35% Assistant Professor and 53% others. However, regarding the ages of the business teachers, the age is from 24 to 70 years. The average age is 48years. The experience of teaching years is from 2 to 35 years. The average experience teacher is 21 years. (Tables 5 and 6) illustrates the above mentioned data in details.

Table 5. Summary of personal and demographic characteristics

Gender		**Age**		**Academic Rank**		**Teaching Experience**	
	No.		Freq		Freq		Freq
Male	103	24-30	32	Professors	5	5 or less	10
Female	2	31-40	28	Assoc. Professors	10	6-10	30
		41-50	25	Asst. Professor	35	11-15	40
		50 and above	20	others	55	16 and above	25
Total	105		105		105		105

The main source of technology training used by the teachers was 'self-taught' followed by workshops/conferences (Table 6).

Table 6. Sources of technology training used by teachers

	Source	**No.**	**%**
1	Self-taught	100	95.5
2	Workshops/conferences	95	91.0
3	Colleagues	86	82.1
4	College courses	55	52.2

Note: N = 105. The teachers were asked to place a check mark (□) beside each type of technology training they had used.

The technology available to teachers presented in Table 7 shows that over two-thirds had a school email account (97.0%), a computer with an Internet connection both at school (94.0%) and at home (82.1%), and a videocassette, CD or DVD recorder (68.7%). Almost one half had a digital video camera (46.3%) while fewer than one-third had students with school email accounts (28.4%), GPS (Global Positioning System) (19.4%), or a PDA (personal digital assistant) (4.5%).

Question 2: Technology Adoption/Adopter Groups

The adoption and use of technology in instruction by teachers has been measured by using the authors' Technology Adoption Scale. The scale shows that the teachers replied to 15 articles through using an anchored scale: 1 = Not Like Me At All, 2 = Very Little Like Me, 3 = Somewhat Like Me, 4 = Very Much Like Me, and 5 = Just Like Me. Hence, Table 8 illustrates the means and standard deviations of the technology items adoption scale together with the interpretation scale.

The scale shows that the most rated item is "I have made physical changes to accommodate technology in my classroom or laboratory,". This indicates that the item "Very Much Like Me" (M = 4.25, *SD* = .98). In contrast, the second and highest rated item is "I emphasize the use of technology as a learning tool in my classroom or laboratory,". This also indicates that the item "Very Much Like Me" (M = 4.06, *SD* = 1.10). Whereas, the lowest

rated item is "I use technology based games or simulations on a regular basis in my classroom or laboratory," in which this result indicates that "Somewhat Like Me" (M = 2.78, *SD* = 1.43). The scale mean is 3.71 (SD = 1.08).This result indicates that the teachers perceived the items in the scale are wholly to be "Very Much Like Me." Therefore, the scale mean indicates that the teachers of technology do not adopt technology in the instructions at the highest level, "Just Like Me".

Table 7. Types of technology available to technology teachers for use in instruction

No.	Technology Available for Use in Instruction	No.	%
1	Teacher has school email account	102	97.0
2	Teacher has computer with Internet connection at school [a]	99	94.0
3	Teacher has computer with Internet connection at home [a]	86	82.1
4	Video Cassette, CD, or DVD Recorder [a]	72	68.7
5	Interactive DVDs or CDs [a]	63	59.7
6	Teacher has access to enough computers in a classroom or lab for all students to work by themselves or with one other student	60	56.7
7	Laser disc player or standalone DVD or CD players [a]	55	52.2
8	Digital video camera [a]	49	46.3
9	Students have a school email account	30	28.4
10	GPS (Global Positioning System)[a]	20	19.4
11	Personal Digital Assistant (e.g., Palm, IPAQ, Blackberry)[a]	5	4.5

Notes: *N* = 105. The teachers were asked to place a check mark (□) beside each type of technology that was available for their use in instruction. [a] The number of technologies available to each teacher ranged from 0 to 9 and was totaled to create an available technology score for use in the regression analysis for research question 5.

Question 3: Barriers that obstacle using Technologies in Instruction

The researchers developed the Barriers to Integrating Technology in Instruction Scale to be used in determining the scope of barriers that prevent technology education teachers from using technology in the instruction process. Thereupon, the following explanation comes to illustrate the seven items that the teachers responded to by using the following anchored scale: 1 = Not a Barrier, 2 = Minor Barrier, 3 = Moderate Barrier, and 4 = Major Barrier. Thus, Table 9 illustrates the means and standard deviations of the items in the Barriers to Integrating Technology in Instruction Scale, along with the interpretation scale.

Generally speaking, the teachers experienced minor barriers as they included technology in instruction (Scale *M* = 2.04, *SD* = .64). It shows that the teachers experienced moderate barriers with "Availability of technology for the number of students in my classes" (*M* = 2.64, *SD* = 1.14), and with the "Availability of technical support to effectively use instructional technology in the teaching/learning process" (*M* = 2.59, *SD* = 1.02). In addition to the item of having "Enough time to develop lessons that use technology" (*M* = 2.55, *SD* = 1.13). However, the item that got the lowest rating is "Administrative support for integration of technology in the teaching/learning process" (*M* = 1.83, *SD* = 1.01). This finding indicates that they have just experienced minor barriers.

Question 4: Teachers Anxiety Caused by Technology

The Technology Anxiety Scale is a researcher-developed scale which is used to determine the anxiety teachers feel when they think about using technology in the instruction process. The teachers responded to all of the 12 included items by means of using the following anchored scale: 1 = No Anxiety, 2 = Some Anxiety, 3 = Moderate Anxiety and 4 = High Anxiety and 5 = Very High Anxiety. Thereupon, Table 10 illustrates the means and standard deviations for the items of the Technology Anxiety Scale, together with the interpretation scale.

The study shows that the teachers of technology have experienced certain anxiety as they integrated technology in the instruction process. The scale mean is in the item (Scale *M* = 1.97, *SD* = .95) and all item means are in the item "Some Anxiety" range. The findings of this survey show that the teachers of technology are experiencing the highest anxiety level with the question, "How anxious do you feel when you cannot keep up with important technological advances?" (*M* = 2.15, *SD* = 1.09). However, the lowest anxiety level appears when they have been asked the question, "How anxious do you feel when you think about using technology in instruction?" (*M* = 1.75, *SD* = 1.06**).**

Table 8. Responses to the items in the technology adoption scale

No.	Item	*N*	*M*	*SD*
1	I have made physical changes to accommodate technology in my classroom or laboratory.	105	4.25	0.98
2	I emphasize the use of technology as a learning tool in my classroom or laboratory.	105	4.06	1.10
3	I expect my students to use technology so they can take on new challenges beyond traditional assignments and activities.	105	3.97	1.28
4	I expect my students to fully understand the unique role that technology plays in their education.	105	3.97	1.13
5	I discuss with students how they can use technology as a learning tool.	105	3.88	0.90
6	I expect my students to use technology to enable them to be self directed learners.	105	3.81	1.22
7	I design learning activities that result in my students being comfortable using technology in their learning.	105	3.81	1.30
8	I expect students to use technology to such an extent that they develop projects that are of a higher quality level than would be possible without them using technology.	105	3.81	1.22
9	I regularly pursue innovative ways to incorporate technology into the learning process for my students.	105	3.70	1.33
10	I incorporate technology in my teaching to such an extent that it has become a standard learning tool for my students.	104	3.68	1.43
11	I am more of a facilitator of learning than the source of all information because my students use technology.	104	3.59	1.36
12	I assign students to use the computer to do content related activities on a regular basis.	105	3.57	1.32
13	I use technology to encourage students to share the responsibility for their own learning.	105	3.43	1.26
14	I incorporate technology in my teaching to such an extent that my students use technology to collaborate with other students in my class during the learning process.	104	3.35	1.43
15	I use technology based games or simulations on a regular basis in my classroom or laboratory.	105	2.78	1.43

Note: *N* = 105. Scale interpretation ranges for the scale means: 1 = Not Like Me at All (1.00-1.49), 2 = Very Little Like Me (1.50-2.49), 3 = Somewhat Like Me (2.503.49), 4 = Very Much Like Me (3.50-4.49), and 5 = Just Like Me (4.50-5.00). Scale *M* = 2.78 (*SD* = 1.43).

Table 9. Responses to integrate technology in instruction scale

No.	Item	N	M	SD
1	Availability of technology for the number of students in my classes.	105	2.64	1.14
2	Availability of technical support to effectively use instructional technology in the teaching/ learning process.	104	2.59	1.02
3	Enough time to develop lessons that use technology.	105	2.55	1.13
4	Scheduling enough time for students to use the Internet, computers, or other technology in the teaching/learning process.	105	2.43	1.05
5	Availability of effective instructional software for the courses I teach.	105	2.37	0.97
6	My ability to integrate technology in the teaching/learning process.	105	2.09	0.87
7	Administrative support for integration of technology in the teaching/learning process.	103	1.83	1.01

Note: *N* = 105. Scale interpretation ranges for the scale means: 1 = Not a Barrier (1.001.49), 2 = Minor Barrier (1.50-2.49), 3 = Moderate Barrier (2.50-3.49), 4 = Major Barrier (3.50-4.00). Scale *M* = 2.04 (*SD* = .64)

Question 5: Explanation of Variance in Technology Adoption

The study uses Forward Multiple Regression to determine whether the selected variables can explain a considerable proportion of the variance in the adoption of technology in the process of instruction. Thereupon, the dependent variable in this analysis is the Technology Adoption Scale mean. The review of literature shows that six teacher demographic or personal variables have been categorized as possible illustrative variables: age,

gender, years of teaching experience, and perceived barriers to integrating technology in instruction, technology anxiety, training sources used, and technology available for use in instruction. Hence, Table 6 illustrates the training sources used by the teachers. The training sources score is calculated by assigning one point for each of the four training sources. Table 7 illustrates the available technology types for the instruction variable. Hence, the score is computed by assigning one point for each of nine types of technology.

Table 10. Technology education teachers' responses to technology anxiety scale

No.	Item	N	M	SD
1	How anxious do you feel when you cannot keep up with important technological advances?	105	2.15	1.09
2	How anxious do you feel when you are not certain what the options on various technologies will do?	105	2.10	0.99
3	How anxious do you feel when you think about your technology skills compared to the skills of other teachers?	104	2.05	1.27
4	How anxious do you feel when someone uses a technology term that you do not understand?	105	2.04	1.04
5	How anxious do you feel when you hesitate to use technology for fear of making mistakes you cannot correct?	105	2.03	1.06
6	How anxious do you feel when you are faced with using new technology?	104	1.98	1.06
7	How anxious do you feel when you try to understand new technology?	105	1.97	0.98
8	How anxious do you feel when you try to use technology?	105	1.91	1.00
9	How anxious do you feel when you try to learn technology related skills?	105	1.88	0.99
10	How anxious do you feel when you avoid using unfamiliar technology?	105	1.87	0.95
11	How anxious do you feel when you fear you may break or damage the technology you are using?	105	1.76	1.10
12	How anxious do you feel when you think about using technology in instruction?	103	1.75	1.06

Note: *N* = 105. Scale interpretation ranges for the scale means: 1 = No Anxiety (1.001.49), 2 = Some Anxiety (1.50-2.49), 3 = Moderate Anxiety (2.50-3.49), 4 = High Anxiety (3.50-4.00), 5 = Very High Anxiety (4.50-5.00). Scale *M* = 1.97 (*SD* = .95)**.**

Table 11, on the first hand, illustrates the correlations of the seven demographic and personal variables with the Technology Adoption Scale score. As a result, it had been determined *a priori* that only those variables that were significantly correlated with the adoption scale score would be utilized in the regression analysis. This finding comes out due to the minimum number of observations needed per variable for the regression analysis.

On the other hand, Table 11 shows that the adoption scale score is moderately correlated with four of the ten variables. Namely, barriers to technology integration (*r* = -.32), technology anxiety (*r* = -.42, technology availability (*r* = .43), and the use of colleagues as a training source (*r* = -.31). These four variables are utilized in the forward multiple regression analysis. The sample size is suitable for this inquiry. Similarly, Hair, Black, Babin, Anderson, and Tatham (2006), state that minimum of 5 observations per variable was required; whereas, 15-20 observations for each potential explanatory variable were needed in a forward regression analysis**.**

Table 11. Correlations of selected variables with teachers' technology adoption scores

Variable	*r*	*p*	*N*
Age	.04[a]	.793	60
Gender	.06[a]	.619	67
Years Teaching Experience	.02[a]	.859	67
Barriers to Technology Integration	-.32[b]	.011	64
Technology Anxiety	-.42[b]	<.001	65
Technology Available	.33[b]	.006	67
Training Sources:			
Self –taught	-.02[a]	.853	66
Workshops/conferences	.19[a]	.122	66
College courses	-.04[a]	.751	66
Colleagues	-.31[b]	.012	66

Notes: *N* = 105 [a] Negligible association according to Cohen (1988). [b] Moderate association according to Cohen (1988).

As a matter of fact, Table 12 illustrates that multicollinearity did not exist in the regression analysis. For instance, Hair et al. (2006) state that, "The presence of high correlations (generally, 90 and above) is the first indication of substantial collinearity". Thereupon, the independent variables had not a high correlation with other independent variables. Also, Hair et al. (2006) show that, "The two most common measures for assessing both pairwise and multiple variable collinearity are tolerance and its inverse, the variance inflation factor (VIF). What's more, a multiple correlation of .90 between one independent variable and all others …would result in a tolerance value of .19. In consequence, any variables with tolerance values below .19 (or above a VIF of 5.3) would have a correlation of more than .90" (Hair et al., 2006, pp. 227, 230). This shows that none of the tolerance values observed rates lower than .19 and none of the VIF values exceeded 5.3. This also states that the three variables that entered into the forward multiple regression analysis explain 37% of the variance (R^2) in technology adoption in instruction.

With respect to the variable "technology anxiety" entered the model first and accounted for 17% of the variance. Then, it followed by "technology available for instruction" which accounted for an additional 13% of the variance. Colleagues as a training source entered the model last which explains 7% of the variance. Technology adoption increases as available. (Standardized *b* =.35) increases, as technology anxiety decreases (Standardized *b* = -.40).However, when teachers use colleagues as a training sources (Standardized *b* = -.27). A regression model that explains 37% of the variance represents a large effect size (Cohen, 1988). "Barriers to technology integration" did not explain additional variance in technology adoption. Below, Table 12 presents the multiple regression analysis.

Table 12. Forward regression analysis model explaining variance in technology adoption in instruction scale mean

	S	***df***	***MS***	***F***	***p***
Regression	27.57	3	9.19	11.43	<.001
Residual	46.66	58	.80		
Total	74.23	61			

Explanatory Variables in Model			**Adjusted**		**Change Statistics**		
	R	***R2***	***R2***	***SE***	***R2* Change**	***F* Change**	***P* of *F* Change**
Technology anxiety	.41	.17	.15	1.02	.17	12.01	.001
Technology anxiety, technology availability	.55	.30	.28	.94	.13	11.13	.001
Technology anxiety, technology availability, training source: colleagues	.61	.37	.34	.90	.07	6.68	.012

Excluded variable				
Variable	**Beta In**	***t***	***p***	**Partial *r***
Barriers to technology adoption	.02	.20	.843	.03

Notes: *N* =105 Dependent variable: technology adoption. Technology Adoption Scale: 1 = Not Like Me at All, 2 = Very Little Like Me, 3 = Somewhat Like Me, 4 = Very Much Like Me, and 5 = Just Like Me. Technology Anxiety Scale: 1 = No Anxiety, 2 = Some Anxiety, 3 = Moderate Anxiety, 4 = High Anxiety, 5 = Very High Anxiety. Technology Available variable potentially ranged from 0 to 9 points, but the actual range was 0 to 8 points since none of the respondents had all nine types of technology. Barriers to Integration Scale: 1 = Not a Barrier, 2 = Minor Barrier, 3 = Moderate Barrier, 4 = Major Barrier.

The combined variables included in the multiple regression model represent a large effect size according to Cohen (1988): R^2> .0196 - small effect size, R^2> .13 - moderate effect size, and R^2> .26 - large effect size**.**

Conclusion

- The technology available to teachers shows that over two-thirds had a school email account (97.0%), a computer with an Internet connection both at school (94.0%) and at home (82.1%), and a videocassette, CD or DVD recorder (68.7%). Almost one half had a digital video camera (46.3%) while fewer than one-third had students with school email accounts (28.4%), GPS (Global Positioning System) (19.4%), or a PDA (personal digital assistant) (4.5%).

- Teachers of technology do not adopt technology in the instructions at the highest level.

- Teachers experienced minor barriers as they included technology in instruction (Scale *M* = 2.04, *SD* = .64). It shows that the teachers experienced moderate barriers with "Availability of technology for the number of students in my classes" (*M* = 2.64, *SD* = 1.14), and with the "Availability of technical support to effectively use instructional technology in the teaching/learning process" (*M* = 2.59, *SD* = 1.02).

- The findings of this survey show that the teachers of technology are experiencing the highest anxiety level with the question, "How anxious do you feel when you cannot keep up with important technological advances?" (*M* = 2.15, *SD* = 1.09). However, the lowest anxiety level appears when they have been asked the question, "How anxious do you feel when you think about using technology in instruction?" (*M* = 1.75, *SD* = 1.06**).**

Recommendations

In recent times, the Palestinian higher education institutions are equipped with instructional technology innovation. This means shifting the way in which teachers and students interact; as well as the roles they take. Thus, the traditional universities in Palestine must act in accordance with their drawn goals. So if the goal is to use who use the technology for a transformative change, there must be a clear focus on training the teachers technology rather than the acquisition of technology itself. However, it is essential to understand and address the required needs of teachers in the faculty development and support systems which would lead to large-scale technology integration to occur in teaching.

At last but not least, the following recommendation must be taken into account by the responsible parties in order to offer the required infrastructure that improve the traditional universities in Palestine; as well as improving their teachers in IT adoption in teaching and using the instructional technology in business education:

1. Develop a long-range technology plan driven by the institutions' overall vision and strategy for its teaching.

2. Establish a promotion system that places a high value on teaching and the use of innovative teaching methods.

3. Design faculty development programs considering the needs of different teacher profiles.

4. Provide training programs not only on the technical aspects of technology, but also about the integration of technology for teaching and learning.

5. Establish an instructional technology center in which teachers can get help from and work together with IT related professionals.

6. Provide systematic technical and professional support.

Note

I bow my head first to ALMIGHTY for the help guidance and blessing he has bestowed me. Second to my wife, and my children who without their support I would not have completed my research.

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