

Utilization of Innovations and Techniques of Educational Technology in Delivering of Educational Practicum and its Impact on Increasing Academic Achievement among Pre-Service Teachers

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Abstract:

The current study aims to identify the utilization of innovations and techniques of educational technology in teaching of educational practicum and its impact on increasing academic achievement among pre-service teachers. The study sample consisted of (60) pre-service teachers (student teachers) randomly selected from public middle and secondary schools. The study adopted the descriptive method; a questionnaire and observation cards designed as tools of the study to achieve the study objectives. The study concluded that the availability of innovations and techniques of educational technology in the schools of educational practicum was low. It also showed that there were challenges of utilizing innovations and techniques of educational technology among student teachers of educational practicum.

Keywords: Innovations, educational technology, practicum, academic achievement.

1. Introduction

In recent decades, the world witnessed scientific and technological revolution which had a significant impact on all aspects of life. Accordingly, the science of techniques of education has become requested to explore new educational methods, models and techniques in order to face several challenges hindering the educational system. The communication and information technologies had a significant impact on the techniques of education and the emergence of several educational innovations such as (E-learning, mobile learning, interactive multimedia, hypermedia, computer instructional and wireless devices), which helped face current educational challenges and promoted the educational process.

Al-Kanadi (2005) indicates that in light of the emergence of such technological innovations and their utilization in education, the role of learners has been changed. Namely, learners changed from being a passive receiver of information to being an active agent in the educational process who searches for information, deals with printed and non-printed educational materials and interacts with them. Further, these technological innovations affected academic courses as well as their content, activities and means of presentation and evaluation. The keenness on giving students the self-learning skills and instilling the love of knowledge in the era of knowledge explosion have become a key objective of such courses. To this end, a new revolution based on modern techniques to be used by teachers in classrooms due to their advantages is required.

The utilization of educational innovations in teaching is deemed one of the significant and contemporary issues. Everyone realizes that the fate of nations is bound with the creativity of their citizens and the extent to which they are capable of adapting change. Education is preeminently placed within the framework of social change and it is one of the key domains included in the wind of change, Al-Ghadeer (2009) explains. The author has identified a significant set of positive aspects that the new education system has according to the modern techniques and models of the education technology, including: simulation of real-life environments and provision of dual communication environment that control classrooms and connect them to the world, besides enabling learners to depend on themselves and promote the self-learning skills among them and making education interactive and effective. This is in addition to attracting the learners' attention to targeted courses, providing a systematic and safe environment for interactive learning, achieving the principle of targeted learning which makes learners aware of their requirements, and updating the way of teaching in a manner that benefits both teachers and learners alike.

According to Abdel-Megid (2000), teaching is an elevated mission and great responsibility, which will not achieve its purposes if randomly delivered. Thus, teachers must reflect the greatness of this profession through being trained on education to acquire field experience that helps them deal with learners in the future. As noted by Reiser (2002), there is almost an agreement between those who are interested in teacher preparation on the significance of field experience, often called 'field training' or 'educational practicum', which means training pre-service teachers on the practical application of teaching.

Student teachers usually attend training classrooms for a specific period of time determined by their educational institution so as to be assured and gain confidence. During such classrooms, student teachers learn about schools, their laws and teachers, acquire teaching experiences and become familiarized with supervisors, their method of evaluation, criticism and help. This is in addition to enhancing relation between them and their

colleagues to benefit from them (Salem & El-Halibi, 1998).

In this regard, Field training is considered a method of overcoming the problems of teaching on the ground under the supervision and guidance of specialists.

Recognizing the significance of educational practicum and field experience at all levels in both developing and developed countries, we had to learn about recent developments in this domain. In this regard, the author attempts to give an overview of the utilization of the most recent techniques and technological innovations in the educational process by student teachers and their impact on acquiring knowledge and skills among learners in a manner that makes them capable of coping with such innovations. Thus, we create a generation of teachers who are able to use such innovations effectively within a developed educational system away from random teaching by student teachers (Atwa, 2001).

2. Statement of the Problem

Through the author's experience in teaching educational technology at the College of Specific Education, the author noted that there was a notable lack of the utilization of innovations of educational technology in teaching and that traditional methods were still prevailing. From the author's viewpoint, this is mainly due to many reasons, including the lack of teachers and specialists of educational technology, the lack of knowledge about the operation of devices and the lack of training, besides student teachers fear abandoning traditional methods and is not convinced with the utilization of technological innovations. Further, professors and teachers at the College who supervise pre-service teachers of the third and fourth years in secondary schools do not provide them with enough experience to utilize modern methods and strategies in teaching the Computer Course and its relevant activities, which has a significant impact on the lack of acquiring knowledge and skills among learners.

Accordingly, during supervising the work of pre-service teachers, the author reviewed lesson-plan booklets of student teachers either in the third or fourth years and found that teaching methods are limited to school books, boards and chalk and that no focus is given to educational methods and techniques (equipment and materials). This indicates that there are difficulties hindering the utilization of modern techniques of education technology in the educational process. Kotler (2001) points out that the modern educational communication technology that includes computer technology, networking technology and satellite technology and which can provide education with great potentials is neglected. In addition, schools that provide such modern technologies lack some potentials and resources. However, in light of current requirements, it is essential that students become aware of such techniques and their method of utilization in order to create a generation of teachers capable of recruiting methods and techniques that cope with recent developments of knowledge and technology in teaching. These techniques of educational technology can substitute several traditional technologies currently used in education. For instance, upon connecting the computer to the internet, radio and television stations as well as educational websites that provide e-learning services can be accessed. Advanced computers can substitute the traditional recorder (Rad- Tell- Tell), besides providing synchronous and asynchronous communication opportunities through utilizing specialized programs for this purpose.

Through reviewing several studies and theoretical and field researches, the author further noticed the scarcity of studies in the educational technology domain relating to the development of the skills of student teachers who are graduates of the educational technology division. Moreover, such studies focused only on the reality of utilizing the traditional educational communication technology. The author came out with this problem in light of the keenness of the indicate and the government on education, especially upper middle and secondary education, and on recruiting innovations and techniques of educational technology to serve education, and out of the significance of grooming a generation of teachers to be specialists in the educational technology at the Education Colleges and to increase the level of academic achievement among student. The problem of the research focuses on identifying the utilization of innovations and techniques of educational technology in teaching of educational practicum and its impact on increasing academic achievement among pre-service teachers.

The author finds out that pre-service students randomly uses such techniques without understanding the skills necessary for their utilization. This default is either attributed to the supervisor from the faculty or to supervisors from teachers or the lab secretary in the schools where student teachers are trained.

2.1 Questions

The study raises the following main question:

What is the impact of utilizing innovations and techniques of educational technology among student teachers at the educational technology decision and their impact on increasing academic achievement among students of the Computer Course? This question gives rise to the following sub questions:

1. What are the innovations and techniques of educational technology that can be utilized in the middle schools of educational practicum?
2. What is the extent to which innovations and techniques of educational technology are available in the

- middle schools of educational practicum?
3. What is the performance level of the utilization of innovations and techniques of educational technology among student teachers in the middle schools of educational Practicum?
 4. What are the obstacles of utilizing innovations and techniques of educational technology in secondary schools in Saudi Arabia?
 5. What are the skills that student teachers need to acquire to be able to use innovations and techniques of educational technology in the middle schools of educational practicum?

3. Objectives

1. Identify the availability of innovations and techniques of educational technology in the middle and secondary schools.
2. Identify the extent to which students of the educational practicum utilize innovations and techniques of educational technology in teaching.
3. Identify the obstacles of adopting the innovations and techniques of educational technology in teaching in the middle schools.
4. Identify the availability of the skills of utilizing innovations and techniques of educational technology among student teachers of educational practicum in the middle schools.

4. Significance

The significance of the study lies in:

1. Benefiting from the results of the current study in the effective utilization of educational technology in teaching the Computer Course.
2. Preparation of a generation of teachers in educational technology capable of dealing with the recent developments and methods in teaching.
3. Utilization of innovations and techniques of educational technology in teaching and raising the level academic achievement among learners.
4. The current study is considered a link between the utilization of innovations and techniques of education technology and teaching courses in general and the necessity of their utilization in the Computer Course in particular.

5. Tools

The following tools are adopted in the current study:

1. A questionnaire that identifies the availability of innovations and techniques of educational technology.
2. A questionnaire that identifies challenges and obstacles of utilizing innovations and techniques of educational technology.
3. Innovations and techniques of educational technology.
4. An observation card that measures the performance skills of utilizing technological innovations (developed by the author).
5. An achievement test in the specified educational content (prepared by the author).

6. Methodology

The current study adopts the quasi-experimental method and the descriptive method as they are appropriate for the subject of the study. These methods include data collection, categorization and explanation as well as reviewing previous studies and researches. This method is not limited to describing the problem; it considers, analyzes and explains all aspects and reasons of the problem and proposes some solutions. Further, through the adoption of such method, the current situation in the schools of Saudi Arabia can be identified.

6.1 Sample:

The study sample consists of (42) student, (21) male students and (21) female students, from the public middle schools where educational practicum is taught for the Academic Year (2015-2016).

6.2 Limitations:

The sample used in this study consists of students in schools where educational practicum is taught with participation from students at the educational technology division in the College of Specific Education for the Academic Year (2015-2016) with regard to the utilization of modern techniques of educational technology.

6.3 Hypotheses:

1. There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the mean of the students' scores in the experimental group (who are taught using technological innovations and

- techniques) and the mean scores of students in the control group (who are taught the same subject by traditional methods) in the post-measurement- following the pre-measurement- of the cognitive achievement test at the memorization level.
2. There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the mean of the students' scores in the experimental group (who are taught using technological innovations and techniques) and the mean scores of students in the control group (who are taught the same subject by traditional methods) in the post-measurement- following the pre-measurement- of the cognitive achievement test at the level of understanding.
 3. There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the mean of the students' scores in the experimental group (who are taught using technological innovations and techniques) and the mean scores of students in the control group (who are taught the same subject by traditional methods) in the post-measurement- following the pre-measurement- of the cognitive achievement test at the level of application.
 4. There are no statistically significant differences at the level of ($\alpha \leq 0.05$) between the mean of the students' scores in the experimental group (who are taught using technological innovations and techniques) and the mean scores of students in the control group (who are taught the same subject by traditional methods) in the post-measurement of the cognitive achievement test at the level of analysis.

7. Procedures

The questionnaires were distributed to (60) teachers randomly selected form (10) public middle and secondary schools.

Table (1) the number of questionnaire distributed to the study sample

Sample	Distributed questionnaires	Returned questionnaires	Percentage of Returned questionnaires	Excluded questionnaires	Completed questionnaires
Computer Teachers	60	60	93.3%	4	56

Given that the current study adopted the descriptive method, the author designed a questionnaire and an observation card as the tool of collecting data and the questionnaire was designed according to the following procedures:

First: designing the questionnaire:

The questionnaire was designed after the author's review of several studies, researches, books and periodicals specialized in the educational technology, and considered one of the main resources of the current study; given that most of which referred to the significance of utilizing innovations of educational technology in education and others identified the obstacles of using such innovations.

Steps of designing the questionnaire:

1- Identify objectives:

- Identify the utilization of innovations and techniques of educational technology among student teachers in the schools of educational practicum.
- Identify the availability of innovations and techniques of educational technology in the schools of educational practicum.
- Identify the challenges and obstacles of utilizing innovations and techniques of educational technology.

2- *Wording of the questionnaire domains:*

First domain: the availability of innovations and techniques of educational technology is identified through the responses to the triple scale (high- medium-low).

Table (2) innovations and techniques of educational technology

Innovations and techniques of educational technology	
1	Global Information Network online.
2	Search engines on the Internet.
3	E-mail contact.
4	Conversation Instant Chat.
5	Transfer files over the Internet.
6	Multimedia.
7	Video conferencing from a distance.
8	Educational TV channels.
9	Expert systems.
10	Programmed instruction.
11	Learning Mobile.
12	Modules.
13	Educational bags.
14	EBook.
15	The electronic blackboard.

Second domain: identify the utilization level of innovations and techniques of educational technology through responses to the triple scale (high-medium-low) through the aforementioned domains.

Third domain: challenges and obstacles of using innovations and techniques of educational technology. It includes a list of challenges that hinder benefiting from such innovation and techniques in education. Every challenge is measured by three levels (high- medium- low), besides providing participants with the opportunity to express their opinions and indicate some reasons that hinder their utilization of such innovations.

3- Validity of the questionnaire:

The author presented the questionnaire to (11) reviewers from the faculty at the educational technology division in various colleges.

4- Reliability of the questionnaire:

Alpha Cronbach was adopted to identify the reliability coefficient of the study tools as well as that of every domain of the tools and the total reliability coefficient of the study tools as shown in the table below:

Table (3) Reliability coefficient of every domain of the questionnaire

Domain	No. of paragraphs	Alpha Cronbach
1. Availability of innovations and techniques of educational technology.	9	0.8
2. Utilization of innovations and techniques of educational technology.	10	0.7
3. Challenges of utilizing innovations and techniques of educational technology.	18	0.8
Total reliability	37	0.8

The reliability coefficient of the questionnaire reached up to 0.8 and the reliability coefficient of the various domains ranged between (0.7) and (0.8), which is appropriate for the objectives of the study.

Second: Observation card:

1- Designing:

An observation card was designed to measure the skills and performance of utilizing innovations and techniques of educational technology through the following steps:

- Identify objectives of the card: the card aims to identify skilled performance with regard to innovations and techniques of educational technology in schools where educational practicum is taught.
- Identify content of the card: the card includes (12) basic skills for using innovations and techniques of educational technology.
- Resources of the skills included in the observation card: upon developing the skills list and deriving relevant sub-skills through a set of considerations in light of which the main skills can be identified: benefiting from axes and dimensions of the theoretical framework of the study, the author developed a list of main skills that should be acquired by pre-service teachers with regard to the utilization of innovations and techniques of educational technology as shown in table (2).

2- Wording of the observation card:

After analyzing main skills into sub-skills, the observation card was drafted in the form of consecutive behavioral skills that can be directly noticed. Consideration was given to the following: simplicity and clarity, maintaining short paragraphs, avoiding negative paragraphs, focusing on one performance and using the present simple to make the behavior noticeable. The observation card included (53) skills.

3- Designing the observation card:

The observation card was designed to include (12) main skills that were divided into relevant (53) sub-skills as

indicated in annex (3) of the observation card.

4- Reviewing the observation card:

Presenting the card to a group of reviewers:

Reviewers added some amendments to the wording of paragraphs which had a significant impact on the preparation of the observation card in its final form. Thereby, the card became valid.

Reliability of the observation card:

Reliability of the observation card was calculated through the agreement of reviewers by adopting Copper Equation. Afterwards, coefficient of agreement for every student was calculated. The author found out that the highest coefficient of agreement was (89.7), the lowest was (86.46) and the mean was (88.08), which proves the reliability of the instrument.

Third: Preparation of the achievement test:

The purpose of the achievement test is to measure students' abilities in terms of remembering, understanding, analyzing and applying the content of the academic course, besides identifying the aspects of learning and preparing an achievement test in the form of multiple choices and true or false questions. The test initially included (53) questions and after reviewing these questions by the author and a number of reviewers in the field of educational technology, teaching methods and evaluation, 5 questions were deleted. The remaining (31) questions were distributed as follows: (9 questions) for remembering, (8 questions) for understanding, (7 questions) for application, and (7) questions for analysis. One point was determined for each correct answer. The test was applied to a sample of students of the College of Education to identify the appropriate time and ensure its validity and reliability.

The coefficients of easiness and difficulty for questions of the test were identified (Zaytoun, 2001) and the reliability coefficient reached up to (0.86) which is acceptable. Following the verification of the content validity, the test's intrinsic validity was calculated and was (0.89) which is acceptable.

Identify vocabulary of the test: by reviewing previous studies tackled such as Al-Agami (2004), Al-Khawaleda (2003), Abu Zayd (2003) and Al-Lazzam (2002), the author found out that most of the previous studies used objective vocabulary and avoided subjectivity in the correction process.

Several studies that tackled evaluation methods in general and objective tests in particular as well as the criteria to be followed in the good test were considered such as: Dwidri (2003), Ali (2002), Al-Oumariya (2005), and Al-Qadi (2002).

Drafting vocabulary of the test: vocabularies of the test were drafted in the form of true or false questions and multiple choices, given that the question includes two parts, as defined by Zaytoun (2001), namely introduction of the question and answers. The author depended on books and theses where tests relating to scientific concepts were prepared in the form of multiple choices. These books included Shehab (2002) and Al-Bughdadi (2003) and the theses comprised Al-Agami (2003), Al-Khawaleda (2003) and Abu Zeid (2003). The author was keen on considering some recommendations of a number of pedagogical literatures such as Al-Lazam (2002), Ali (2002) and Al-Gaafary (2003).

Reviewing and proofreading vocabularies: vocabularies of the test were reviewed after an appropriate period of their drafting to ensure that they are free from complexity in meaning and overlapping which may affect the achievement of the test's goal.

Identify the final number of the test's vocabularies: in light of the reviewers' views and suggestions, the test included (31) questions. Every question is designed to measure an educational goal; given that more than one question may measure a goal of each level the four cognitive levels (remembering, understanding, application and analysis).

Instructions of the test: the instructions aim to explain the test's ideas in the simplest form possible, thus the drafting of such instructions should be concise and clear.

Method of correcting the test: each correct question is scored one mark, given that the test in its initial form included (16) vocabularies in the form of multiple choices and (15) ones in the form of true or false, thus the maximum score of the test is (31) and the minimum is (0).

Application of the test: after the preparation of the achievement test in its initial form, it was applied to an exploratory sample of (15) students different from those included in the study's sample.

Time duration of the achievement test: the necessary time of the achievement test using the following equation mentioned by Al-Huzaifi (2003):

$$\text{Time of the test} = \frac{\text{Time of the first student} + \text{Time of the last one}}{2} = \frac{72}{2} = \frac{72}{2} = 36 \text{ minutes}$$

The time spent by the first student was (32) minutes and the time spent by the last student was (53) minutes and by calculating the mean, the total time of the test became (36) minutes.

Reliability of the achievement test: after applying achievement test to students of the exploratory sample, their responses to the test's vocabularies were corrected by one score was given to each correct answer

and zero to the wrong one. The reliability of the test was (0.84) which is a high value that allows the utilization of the test as a tool to measure the cognitive achievement of the students, thereby obtaining trusted results.

Reviewers' validity: Obaidat & et al. (2003) indicate that reviewers' validity can be measured through presenting the test to a number of specialists and experts in the targeted domain, if they emphasized that the test fulfills its purposes, they can be trusted.

First: Pre-application results

After collecting data from the pre-measurement of the experimental and control sample for the academic achievement test and ensuring the consistency of the sample, the T-Test was adopted following the calculation of the arithmetic mean and the standard deviation as shown in table (4) below.

Table (4): results of the analysis of the pre-achievement test

Group	No. of students	Mean	Standard deviation	Degree of freedom	(T) Value	Significant level
Control	22	50,0	89,0	38	17,0	83,0 Statistically insignificant
Experimental	22	45,0	1.87			

Table (4) indicates that the calculated (T) value is statistically insignificant and that there is also no significant difference between the achievement of the experimental and control groups before the adoption of the techniques and innovations, which emphasizes the consistency and equality between both groups before application in terms of the educational content.

Second: Post-application results:

Table (5) post-application results and (T) Value among students of both groups in the academic achievement test

Group	No.	M	St. D	T Value
Experimental	22	42.11	3.41	6.3 Significant at 00.05
Control	22	38.91	4.61	

Table (5) shows that the calculated (T) Value (6.3) is statistically significant at the level of 0.5 which emphasizes that there is a statistically significant difference between the mean scores of students of both the experimental and control groups, in favor of the former group which adopted the innovations and techniques of educational technology, which agrees with previous studies. Table (5) further indicates results of the utilization of the (T) Test to identify the effect of techniques and innovations "pre and post application" on academic achievement in terms of remembering, understanding, application and analysis. It clarifies the following:

First: remembering:

Table (7): Calculating the arithmetic mean and standard deviation as well as (T) values and its significance at the level of remembering

Domain	Application	No.	Mean	Standard deviation	"T" Value	Significance level
Remembering	Pre	22	61.2	76.1	82.22	00.01
	Post	22	94.12	07.2		

Table (7), which tests the validity of the first hypothesis of the current study that indicates that there is no statistically significant difference between the mean scores of students in both groups, shows that the arithmetic mean of the pre-measurement is (94.12) which is greater than that of the post- application which is (2.61) and that the calculated "T" value is 22.82 which is greater than the tabulated T Value Which is (2.457) \geq (05.0) between the $\square\square$ means. This means that there are statistically significant differences between the score of the experimental group in the pre and post application of the achievement test at the level of remembering, in favor of the post-application, thus the first experimental hypothesis of the current study is rejected.

Second: Understanding:

Table (8) Calculating the arithmetic mean and standard deviation as well as (T) values and its significance at the level of understanding

Domain	Application	No.	Mean	Standard deviation	"T" Value	Significance level
Understanding	Pre	22	2.58	1,46	12.21	00.01
	Post	22	8.08	2.27		

Table (8), which tests the validity of the second hypothesis which indicates that there are no statistically significant differences between the mean scores of students who are instructed using innovations and techniques and those who are instructed using traditional methods in order to test academic achievement at the level of understanding, indicates that the mean in the post-application is (8.08) which is greater than the mean in the pre-application which equals (2.58). The calculated "T" Value is (12.21) which is greater than the tabulated T Value (2.45 \geq 05.0) in achievement between $\square\square\square$. This means that there are statistically significant differences

between the mean scores of students in the pre-and-post application at the level of understanding, in favor of the post-application. Thus, the second hypothesis of the current study is rejected.

Third: Application

Table (9): Calculating the arithmetic mean and standard deviation as well as (T) values and its significance at the level of application

Domain	Application	No.	Mean	Standard deviation	"T" Value	Significance level
Application	Pre	22	1.75	1.13	15.50	0.01
	Post	22	44.6	1.42		

Table (9), which tests the validity of the third hypothesis which indicates that there are no statistically significant differences between the mean scores of students of the experimental group who are instructed by innovations and techniques of educational technology and those of the control group who are instructed by traditional method in the pre-and-post application in order to test the academic achievement at the level of application, demonstrates that the mean in the post-application is (44.6) which is greater than the mean in the pre-application which equals (1.75). The calculated "T" Value is (15.50) which is greater than the tabulated T Value ($457.2 \geq 05.0$) in achievement between $\square\square\square$ This means that there are statistically significant differences between the mean scores of students in the pre-and-post application at the level of application, in favor of the post-application. Thus, the third hypothesis of the current study is rejected.

Fourth: Analysis

Table (10): Calculating the arithmetic mean and standard deviation as well as (T) values and its significance at the level of analysis

Domain	Application	No.	Mean	Standard deviation	"T" Value	Significance level
Analysis	Pre	22	1.52	0.94	7.63	0.01
	Post	22	3.47	1.21		

Table (10), which tests the validity of the fourth hypothesis which indicates that there are no statistically significant differences between the mean scores of students of the experimental group who are instructed by innovations and techniques of educational technology and those of the control group who are instructed by traditional method in the pre-and-post application in order to test the academic achievement at the level of analysis, reveals that the mean in the post-application is (3.47) which is greater than the mean in the pre-application which equals (1.52). The calculated "T" Value is (7.63) which is greater than the tabulated T Value ($457.2 \geq 05.0$) in achievement between $\square\square\square$ This means that there are statistically significant differences between the mean scores of students in the pre-and-post application at the level of analysis, in favor of the post-application. Thus, the fourth hypothesis of the current study is rejected.

Fifth: Dimensions of the achievement test

Table (11): Calculating the arithmetic mean and standard deviation as well as (T) value and its significance at all the achievement levels

Level	Application	No.	Mean	Standard deviation	"T" Value	Sig. Level
Total=(remembering, understanding, application, analysis)	Pre	22	8.53	3.38	20.22	.01
	Post	22	30.94	5.03		

Table (11), which tests the validity of the fifth hypothesis which indicates that there are no statistically significant differences between the mean scores of students of the experimental group who are instructed by innovations and techniques of educational technology and those of the control group who are instructed by traditional method in the pre-and-post application in order to test the total academic achievement, shows that the mean in the post-application is (30.94) which is greater than the mean in the pre-application which equals (8.53). The calculated "T" Value is (20.22) which is greater than the tabulated T Value ($457.2 \geq 05.0$) in achievement between $\square\square\square$ This means that there are statistically significant differences between the mean scores of students in the pre-and-post application, in favor of the post-application. Thus, the fifth hypothesis of the current study is rejected.

The results can be explained as follows:

- Although the arithmetic means of both groups are close in terms of their performance in the achievement test, differences were in favor of the experimental group. Such closeness may be due to the memorizing method students became accustomed to and the nature of achievement tests that require recalling information. Nevertheless, results indicate the effectiveness of innovations and techniques of educational technology in increasing academic achievement among participants of the experimental

sample due to the facilitation of information provided by instructors, besides providing learners with the opportunity to explore concepts of the topic that attract them. This is in addition to the activity book owned by learners to write down their notes during the learning process, which made learners more positive.

- Results further show that the academic achievement in terms of the four levels (remembering, understanding, application and analysis) may be attributed to the fact that students of the experimental group studies by using innovations and techniques of educational technology which provided them with the opportunity to increase their level of academic achievement. The control group, on the other hand, depends in traditional methods or theoretical framework of the content of academic courses.
- Writing down notes in the activity book helps acquire knowledge through self-learning which is further emphasized to learners according to their attitudes and positive participation in the learning process during application, which, in turn, made education more effective and the acquisition of skills more easy. Thus, the second hypothesis of the current study is rejected.

Effect size:

In order to identify the effect size of the independent variable (the utilization of techniques and innovations) on the dependent variable (academic achievement), Eta-squared η^2 and D-value were calculated (Murad, 2000). Table (12) indicates these results.

Item	DF	T-value	Eta squared " η^2 "	D-value	Effect size
Test	42	21.53	0.916	6.60	High

Table (11) indicates that η^2 value reached (0.916) and D-value (6.60) which is greater that (0.8). This shows that the independent variable is “techniques and innovations’ has a significant impact on the independent variable “academic achievement”.

$$d = \frac{\sqrt{2T}}{\sqrt{2T + DF}} = \frac{\text{Square root of } (\eta^2) * 2}{\text{Square root of } (\eta^2 - 1)}$$

This makes the fifth hypothesis of the current study, which indicates that there are not statistically significant differences at the level of $(\alpha \leq 0.05)$ between the mean scores of students in both the experimental and control groups in the post-achievement test, in favor of the experimental group, invalid.

Conclusion

1. The study concludes that the availability of innovations and techniques of educational technology in the schools of educational practicum among junior and senior student teachers is low, given that the general arithmetic mean reaches (2.7).
2. There are challenges of utilizing innovations and techniques of educational technology among student teachers of educational practicum, given that the general arithmetic mean of the difficulty level reaches up to (1.44).
3. The skills of utilizing innovations and techniques of educational technology among student teachers are low, given that the arithmetic mean reaches (1.34).

Recommendations

- Educational practicum is the bridge between the academic aspect and the educational one. The training of teachers must include both aspects so as to tailor the educational courses according to the needs, characteristics and requirements of learners. Thus, the training plan should also the scientific aspect that makes teachers master their courses with all their aspects and details.
- It is necessary that the Ministry of Education provides innovations of educational technology in all schools, especially middle and secondary schools.
- It is necessary to recruit some experts and specialist to give training on innovations of educational technology, taking into consideration that some supervisors are not originally trainers which may change training income courses into ineffective lectures.
- An educational techniques utilization manual should be developed to present the rules of selecting the content educational techniques as well as the rules to be considered before, during and after utilization.
- It is necessary to furnish schools with all potentials that allow the utilization of technological innovations in an appropriate manner.
- Against this backdrop, both academic and educational aspects have to be integrated into the teaching process through education practicum which is deemed the meeting point of both aspects.

- Educational practicum is the means through which students' attitudes towards teaching are formed and through which student teachers acquire the necessary teaching skills. Thereby, student teachers acquire the rules of teaching through continuous and serious training during the educational practicum period.
- Educational practicum is the way student teachers pass to identify the problem-solving methods and become familiarized with the prevailing relations in the educational community in order to learn about the rules and regulations necessary to keep the educational process on the right track.
- Educational practicum makes student teachers become familiarized with the vital issues which be dealt with in the educational process so that in the future they might be able to provide students with knowledge and experience that make them successful and influential in the society. To this end, the current research comes up with a number of recommendations as follows:
 - Plan and develop the educational practicum programs for specialization programs and various educational domains in coordination with colleges of education.
 - Provide students with the educational methods and strategies that enable them to be successful instructors through the courses, forums and workshops that contribute to mastering teaching strategies, enhancing managerial efficiency of the educational process and updating educational methods that are applied in the colleges of education.
 - Develop an evaluation system for students, analyze the results of the evaluation with participation from specialized centers and develop the necessary relevant reports.
 - Provide suggestions and recommendations that aim to develop and increase the efficiency of the development criteria of the educational practicum program in light of the evaluation results of the graduates' performance.
 - Unify the processes of planning, designing, evaluation and development of the educational programs and courses as well as follow up on their implementation in colleges.

Suggestions for future research:

1. Instructors' attitudes towards the utilization of innovations of educational technology.
2. Comparative study between the effect of the utilization of traditional educational methods and modern educational techniques on students' academic achievement.
3. Conducting similar studies on other educational levels.

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