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E-Teaching Contribution Level in Undergraduate Education at Jordanian Public Universities

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Abstract

Information and Communication Technologies (ICTs) are any electronic tools and software that is used to support lecturers while teaching and students while learning. This study aims to provide an in-depth analysis of lecturers' attitudes towards, and use of, ICT for teaching at Jordanian public universities. Four Jordanian public universities have been investigated in this matter. Quantitative data have been used to collect data, as attitude surveys of 448 lecturers have been conducted. Results of the study indicate positive attitudes and high levels of ICT use in teaching and learning. The results also revealed a medium effect of factors affect ICT use in teaching and learning. Lecturers believe that ICT use saves time and efforts and helps them gaining new knowledge and skills, while they believe that the lack of technological infrastructure, lack of support, lack of training and lack of financial resources are the most important factors that have huge impact on ICT in teaching and learning. It was concluded that it is important to overcome the negative factors by adopting clear vision about ICT integration based on the current situation and the desired one, and to adopting flexible plans that respond to social, cultural, and economic changes.

Keywords: E-Teaching, Technology, Higher Education

1. Introduction

The most significant feature of this century is knowledge explosion; this name came as a result of generating knowledge and information using information and communication technology (ICT) tools including the extraordinary technical invention "computers". This invention draws educator's attention as well as all those who are interested in learning and teaching in all academic levels and specializations. In those days the power measured by possession of technical infrastructures and ability to use them in a proper way to suit the information society of this century.

2. Literature Review

Naturally perceptions about objects and concepts are developed based on several factors related to these objects and concepts, in other words we can't develop negative and positive perceptions about new innovation without recognizing their benefits, defects and effects. According to Mwalongo (2011) teachers did not use ICT to radically change their pedagogical practices, but rather to sustain their traditional practices. On the other hand knowing what ICT is doesn't mean that it is accepted and adopted by all educators and students. Many lecturers refuse to use ICT, and perceive it negatively, as do the students; ICT is more of a burden than a helping tool kit for some them, while it is the saviour for the others. Loveless (2003) believes that teachers' perceptions of ICT in education are influenced by the discourse of official documents and guidelines, and also by the teachers' own experiences of using ICT within a social and professional context in which the profile of and access to ICTs is fast-changing. Regarding the factors that affect perceptions about ICTs in education, Galanouli and McNair (2001) concluded that the lack of resources and lack of professional training are the main factors. They also concluded that in order to improve school-based ICT developments the schools should be supported and equipped and effective training courses should be provided to teachers.

Regarding faculty members and students' perceptions and attitudes in Jordanian universities about E-learning concepts, Al Khatib (2006) examined to what extent they really use it in university instruction. The results indicated positive perceptions about e-learning concepts among faculty members in Jordanian universities. Moreover, the results indicated significant statistical differences in faculty perceptions about E-learning concepts dependent on university (in favour of public universities), dependent on gender (in favour of males), dependent on faculty (in favour of humanitarian faculties), dependent on academic qualification (in favour of PhD holders), dependent on academic rank (in favour of Assistant Professor), dependent on age (in favour of age 30- 39 years), and dependent on experience (in favour of 3- 10 years of experience). For the second part the results indicated a

weak use of E-learning by faculty members in university instruction among Jordanian universities. In addition to this there were significant statistical differences dependent on university (in favour of private universities), dependent on faculty (in favour of humanitarian faculties), dependent on academic rank (in favour of Assistant Professor), dependent on age (in favour of age 30- 39 years). Abu Qudais, Al-Adhaileh and Al-Omari (2010) found out believe that working with computers would be enjoyable and stimulating, and because they want to learn a lot about computers; this reveals positive attitudes toward ICT use in education. Another study was conducted in Jordan by Al-Zaidiyeen, Mei and Fook (2010) about teachers' attitudes and levels of technology use in classrooms. Quantitative data were collected for the study. A questionnaire was distributed to 650 teachers in Jordan, randomly selected, and 460 teachers responded to the questionnaire. This sample is considerably bigger than other samples, and could contribute to the reliability and validity of the study. The findings of the study revealed that teachers had a low level of ICT use for educational purposes; the findings also revealed that teachers have positive attitudes towards the use of ICT, in spite of their weak use of it. The study suggested that educational stakeholders should pay more attention for ICTs' uses for educational purposes.

It is well known that students are affected by their teachers' values, knowledge, attitudes and perceptions, but teachers also could be affected by their students. So it is important to understand how students perceive ICT in education. Beauchamp & Parkinson (2008) conducted a study on school students' perceptions as they transfer from an ICT-rich primary school to a secondary school with fewer ICT resources. The lack of resources in the secondary school caused some frustration because students in primary school expected to use ICT in every lesson; they enjoyed the way of presenting information and finding things out by themselves when given the opportunity.

Sheard, Carbone and Hurst (2010) in their study which investigated faculty members' perceptions versus students' experiences, believe that there was a shift in perception about teaching and learning over the last two decades. The shift from teacher centred approaches to student centred approach is important evidence on perceptions shift about teaching and learning. On the other hand, there is much evidence that this shift is not universal among faculty members and students; one of the many challenges facing educators while using ICT is the rapid development of ICT. This rapid development puts more loads on faculty members and students as they need to be constantly updated about ICT, and this means more training courses and more complementary courses for faculty members and students. This rapid change may accompany rapid change of faculty members' and students' perceptions. Based on interviews, similarities and differences between faculty members' and students' perceptions revealed that faculty members and students are operating within a student centred approach and are using technology but they are facing challenges regarding this use of technology. This requires the universities to address these challenges to help faculty members and students while integrating ICT into education. Regarding types of perception Fox *et al*. (2007) presented several types of perception. The first perspective is the institutional perspective in which the staff (faculty members) acknowledges the importance of ICT but face a lack of ICT integration at the faculty and at university level because of the lack of strategic plans and the lack of support. The implementation perspective in which the faculty members indicate uncertainty more than satisfaction while discussing ICT implementation and as a result some of them express concern over the abuse of technology and others express doubt over the cost-efficiency of ICT integration, where the funds can be used in other areas, and some of them express that ICT integration will increase workload for them. The pedagogical perspective indicates some recognition of the role of ICT in advancing innovative practice and change, but is not enough to bring about pedagogical innovation. The technological perspective indicates the faculty members' satisfaction with the provided resources and services, but on the other hand the challenge still exists.

Based on the previous studies presented here, perception about ICT is developed based on our understanding of it. Perceptions about ICTs are affected by many factors such as the users' experiences, lack of resources, lack of professional training, the faculty, gender, academic qualification, age, lack of institutional support, and lack of time. Furthermore, many studies indicated that positive perceptions don't mean high levels of ICT use; this is because the use of ICT is also affected by the previous factors that affect the perception in the first place. To develop positive perceptions, suggestions were provided by educators such as increasing lecturers' motivation, because it is believed that motivation and perceptions are related to each other (McCormick, 2004). Other recommendations were provided such as supporting and resourcing educational institutions, and providing effective ICT training.

Many studies investigated the factors that affect ICT use and its integration into teaching and learning. The purpose of this investigation is to shed light on those factors and to determine if they have a positive or negative effect on ICT use, and to identify the adopted procedures to maximize its positive effects and minimize its negative effects.

ICT integration is a complicated process; it is affected by every aspect around it. Such factors, according to Somekh (1998) are time; integration needs time, as discussed earlier, innovations need time. They don't happen suddenly. They are gradual processes. In addition to time, clear values, plans and vision for ICT integration are very important since they are the basis of effective integration, random integration will probably fail. One of the most important factors is the access to essential technology and equipment; ICT integration cannot happen without the availability of necessary equipment. Somekh also believes that providing money for development is another important factor for successful integration. On the other hand the huge increases in student numbers, which is not easy to manage, affects ICT integration, since more time, access to technology will be needed. Somekh concluded that the process of change has been more rapid in the last twenty years, and that if ICT is to be used effectively there are many decisions to be made regarding the resources, tasks, teaching, course organization and assessment. Those decisions must be taken collaboratively. Fullan (1993) identified the following features of successful innovation (ICT integration): staff development and participation, good relationships between teachers, support from the head, a clear timeline, good communications and an internal (or local) consultant to support teachers. Alaadili (1999) indicated that the information revolution and its role as instructional aid is the major motivations for learning how to use computers. Alaadili's study was in public Jordanian universities. The study sample consisted of (457) faculty members, which was chosen randomly from all public Jordanian universities. The sample is large and that could lead to a variation and reliability of findings. On the other hand the sample didn't consist of faculty members from private universities; this could affect the results. Alaadili concluded that the obstacles of ICT integration are the lack of computers, software and training. Eventually, the study recommended holding training courses on how to use computers effectively, how to integrate technology into instruction, and providing necessary technological infrastructure, devices and software. In addition to the previously mentioned factors Abu Qudais, Al-Adhaileh and Al-Omari (2010) identified several institutional and personal barriers to the use of technology, such as resistance to change, fear of technology, and workload. The results were quite interesting since the study is relatively new and the results suppose to indicate more developments and optimistic view of technology use. Faculty members were supposed to overcome the fear of and resistance to technology, and to be aware of its potentials. Spotts (1999) believes that faculties (specialization), availability of devices and technological infrastructure, faculty members' attitude toward technology use in instruction are important factors that affect ICT use. Spotts found that the faculty members vary in their attitudes toward technology use in instruction, although there was mutual support among faculties. The study sample agreed that technical support was the main core of technology use in instruction. Major difficulties faced by faculty members were lack of data about devices and technological infrastructure availability, lack of software, lack of incentives and lack of understanding of technology potentials in education. Other obstacles of technology adoption were found by Thomas (2000) in West Georgia's public universities. These obstacles are the lack of time, the lack of technological infrastructure, the lack of training and professional programs; this is consonant with Somekh's result. In addition to that Thomas found that the lack of personal interest is an important obstacle. Thomas also indicated that the factors affecting technology use by faculty members are availability of training and development programs, updated software, students' interest in learning and accessibility of new technologies. Furthermore faculty members (Thomas' sample) suggested providing professional training programs, reducing work load to save enough time for practising, providing educational software, providing technological infrastructure and devices, mutual faculties' support, and incentives to overcome the obstacles facing them. Al-Mobaideen (2009) in his study about ICT diffusion in Jordanian universities presented many factors that affect accelerated adoption of ICT in universities. The most important factors are the adopted strategies and policies, culture, and availability of infrastructure and funding. Deep understanding of these factors is required to identify and understand their effect on ICT diffusion and adoption. Regarding the culture effect, people seem to resist ICT use because life will be then more mechanical. Al-Mobaideen analyzed these factors and concluded that these factors originate from four resources; the first resource is individuals and their skills, abilities and training. The universities are the second resource itself and its rank among the higher education institutions, along with their adopted policies and strategies and the available infrastructure. Universities' competition, partnerships and globalisation is the third resource. And the fourth resource is related to the environment. This includes the policies and strategies adopted by the government, and grants presented from international organisations (USAID, The World Bank, and UNESCO).

The previous studies, in spite of the place and the time they were conducted in, showed the same obstacles such as the lack of proper training on ICT use, the lack of ICT infrastructure, the lack of time and the lack of incentives. This could be because ICT integration is a complex process. If any of its components are missing the whole process will be affected. In this regard Bomaarafi (2001) recommended holding professional development training courses constantly to develop faculty members' competences regarding internet use.

Based on the previous studies, it was that factors can't be counted, because they are very interrelated and every one affects the others and the whole process. However, most of the researchers agreed that the most important factors are access to ICT infrastructure, clear plans and vision, availability of proper training and support from the top. On the other hand most of the studies agreed that the main obstacles that hinder ICT are lack of time or workload, lack of training, lack of technological infrastructure, resistance to technology. Eventually, lecturers from different studies suggested some procedures to overcome obstacles hindering ICT use in education such as providing professional training programs, reducing workload to save enough time for practising, providing proper educational technology, and providing support and incentives.

3. Problem for the Study

Jordanian public universities have exerted great efforts to include ICT in their educational courses. In order to achieve this, money was dedicated to provide the necessary equipment and devices. In addition, several training programs have been held to educate and train lecturers on how to efficiently use modern technologies in teaching and learning. These new trends have begun recently in Jordan and are an ongoing process; however, we need to shed light on Jordan's lack of natural resources, which forces it to rely on its human capital to compete in local, regional, and global markets (Kanaan, Al-salamat and Hanania, 2009). There is still a need for further insights into the state of educational setting with respect to the e-teaching contribution in the educational field. These insights will give a clear picture about efforts dedicated and money spent on education computerizing related project and the general contribution of ICT in educational processes in Jordanian public universities. On this issue, there are several claims from lecturers in Jordanian public universities about their unwillingness to use educational technologies as they are a major concern for them and a threat to their careers. Many lecturers believe that educational technologies are a major threat for them and will make a key shift in the common vision that lecturers are the only source of knowledge, thus marginalizing their role.

As undergraduate education is a key indicator to determine the effectiveness of educational institutions, my study has attempted to investigate the effective ICT use for teaching undergraduate courses at Jordanian public universities.

4. The Research Aim, Questions

The previous analysis of e-teaching sector in Jordan indicates that Jordan is following global trends of e-teaching integration into education. However, picturing the whole situation from the outside is not enough and further analysis is needed from within the educational sector, and specifically from those working within the universities because they are the responsible for educating the leaders of tomorrow. Within this education schools use ICTs, so universities must also receive more attention in this respect to be able to play its integral part. In this context, universities cannot perform thoroughly without qualified lecturers, who need also to hold positive attitudes about learning and teaching with technology. The review of previous literature, which will be presented in chapter two, indicates a paucity of studies addressing lecturers' attitudes about technology and its integration into teaching in universities. Those that do portray the situation from the outside and conclude the positive and negative factors that affect technology use, but fail to answer the questions about what are the most important factors from lecturers' point of view and what are their actual consequences on university education at all. Based on that, the aim and the objectives of the study were derived.

Research Aim

To provide an in-depth analysis of lecturers' attitudes towards, and use of, e-teaching in Undergraduate Science and Humanities Courses at Jordanian Public Universities.

In order to achieve this aim, the following research questions will be answered:

Research Questions

1. How do lecturers perceive ICT use in teaching?
2. What are the positive and negative factors affecting the use of ICT in teaching?
3. What are the effects of the chosen variables (faculty, experience of teaching, academic rank, gender, age) on using ICT in teaching undergraduate courses?

5. Significance of the Study

The significance of the current study summarized in the following points:

1. Assessing ICT contribution level in university education, as this contributes to identifying the effect of ICT on learners.
2. The current study may provide some ideas about effective ICT use in university education, thus, decision makers in the Ministry of Higher Education in Jordan and in Jordanian public universities may benefit from the results of this study.
3. The study meets current directions and trends in Jordan towards using ICT in education.
4. The current study is necessary because currently there is a dearth of studies addressing the use of ICT, and especially addressing the effective use of ICT in university education in Jordanian public universities.

6. The study population

A population is a group of individuals or organizations that share the same characteristic that is of interest to our study (Hartas, 2010, p.67). The study population consists of all lecturers in science and humanities faculties in Jordanian public universities, 2904 lecturers for the academic year 2010/2011. Those universities offer undergraduate and graduate degrees in a wide range of academic areas (MOHE, 2010).

7. The study sample

A sample "is a section or a subgroup of the population we intend to study" (Hartas, 2010, p.67). In the first phase, 40% of the ten Jordanian public universities were selected according to the geographical distribution (south, middle, and north of Jordan). This means four universities were selected. In the second phase, 20% of the 2904 lecturers were selected by systematic random sampling to form the study sample of 500 lecturers.

8. Research methodology

A quantitative approach was chosen to assess lecturers' attitudes towards ICT use in Jordanian public University.

9. The study variables

Variable is "An image, perception or concept that is capable of measurement – hence capable of taking on different values. In other words, "a concept that can be measured" (Kumar 2011, p.62). According to Field (2009) variable is what we need to measure to test hypothesis. Sarantakos (2005) and Bernard (2000) indicated that variables are things that can take more than one value.

The study includes the following variables:

9.1 Independent variables

Independent variables are "thought to be the cause of some effect". (Field, 2009, p.7) known also as experimental variables (Oppenheim, 2001) so in this study the effect of the following will be addressed.

- The Faculties, which have two levels: scientific and humanity.
- Experience, which has seven levels: 0–5, 6–10, 11–15, 16–20, 21-25, 26-30, and more than 30.
- Academic rank, which has four levels: Full professor, Associate professor, Assistant professor, Lecturer.
- Gender, which has two levels: male and female.
- Age, which has nine levels: 20-24, 25-29, 30-34, 35-39,40-44, 45-49, 50-54, 55-60, and more than 60.

Information regarding the independent variables was collected by the questionnaire.

9.2 Dependent variables:

Dependent variables are defined by Field (2009) and Oppenheim (2001) as the result or effect of the cause or the independent variables.

- Lecturers' estimation of using ICT in teaching and learning in the following five areas: planning outside the lecture room, teaching in the lecture room, administrative tasks, evaluation and other uses.
- Lecturers' definition of factors that affect ICT use in teaching and learning.

10. The study instrument

10.1 The questionnaire

The questionnaire is defined by McColl et al. (2001, p.13) as "a set of scientific procedures for collecting information and making quantitative inferences about populations", while Cohen, Manion and Morrison (2007, p.318) stated that "The process of operationalizing a questionnaire is to take a general purpose or set of purposes

and turn these into concrete, researchable fields about which actual data can be gathered".

McColl et al. (2001) identified the type of data that questionnaires are designed to collect. These include: attributes, such as the stakeholder's age, gender, educational achievements and any other important personal attributes for the study; behaviours and events, which means the frequency of engagement in important activities that are related to the study; beliefs and knowledge, which represent what the stakeholders think or understand about the research issue; and attitudes, opinions and reasons, which is evaluative data, representing the stakeholders' satisfaction or judgements about the research issue.

According to Field (2003, p.1) what make a good questionnaire is three things: the first is the discrimination, which means that "people in different groups should score differently", the second thing is validity, which means that the questionnaire must measure what it is designed to measure (validity of the questionnaire happens on three levels: content, criterion and factorial); and the third thing that makes good questionnaire is reliability, which means that "the questionnaire should produce the same results under the same condition" (Field , 2003, p. 3).

10.2 Questionnaire construction

My questionnaire was constructed after reviewing literature from various authors related to ICT integration into teaching and learning (Alassaf, 2007; Al-khatib, 2006; Ishtiwi, 2006 and Hamdi, 2003). It was also constructed based on the study goals and questions.

11. Pilot testing

Pilot testing is a small study, which is usually conducted before the actual study to test and prepare the research instruments and procedures. The aim of this testing is to identify the research instrument defects in order to address them before carrying out the actual study (Al-Rashed, 2002). Cohen, Manion and Morrison (2007, p.158) stated that "there is a need, therefore, to pilot questionnaires and refine their contents, wording, length, etc. as appropriate for the sample being targeted" . Pilot testing is important to ensure the study's validation (Oppenheim, 2001). According to Algahtani (2011, p.129), "the purpose of the pilot study is to make sure of the selected format for the study, before proceeding to implement the main instrument".

In the current study I used pilot testing to evaluate the questionnaire and to make sure that it is capable of fulfilling what it is designed for. The pilot study was conducted in two stages before the main data collection. In the first stage, I sent the questionnaire to experienced and interested lecturers in educational technology, ICT, IT and computer engineering to read the questionnaire's items, comment, and give suggestions and opinions to develop it into its final form. Piloting is important not only for changing the "wording of questions but also for procedural changes such as the ordering of questions, the introduction design, and reduction of unnecessary parts" (Oppenheim, 2001, p. 47).

The questionnaire piloting started with changing a few items that were originally designed for the context of Jordan. These included replacing the word 'correcting' with 'marking', adding a procedural definition for ICT, and adding a question regarding the places of the training course for the lecturers (inside university, outside university or self-learners). The questionnaire was modified and finalized, according to the notes received.

The second stage of piloting was acquiring permission from the Minster of Higher Education to conduct the pilot study in Jordan at Al-Balqa Applied University (BAU) during the month of November 2010. BAU is a public higher education institution that has nineteen colleges. BAU was chosen for the pilot study because it has a similar nature and faces similar challenges to the four universities which are included in the sample.

The "pilot" questionnaire was distributed to twenty lecturers at a faculty of Education and Arts, Engineering, Science, Information Technology and Business Management. Those faculties were selected because they are available in the other universities which are included in my sample. The questionnaire was collected and redistributed after 22 days. Subsequently, appropriate statistical analysis was carried out by using Pearson statistic, and t-test.

Piloting the questionnaire was very helpful in checking the clarity of its items; identifying any ambiguous word or items in order to rephrase or replace them and checking the time taken to finish the questionnaire to check that it is not too long or too short (Cohen, Manion and Morrison, 2007).

12. Validity and Reliability of the study instrument

In the following section I will discuss what is meant by validity and reliability, why they are used, and how they are applied in the current study. Validity and reliability are widely used in quantitative research and rooted in the

positivist perspective.Validity and reliability mean "quality, rigor, and trustworthiness", to eliminate bias and increase truthfulness of a phenomenon. Triangulation, which is used mostly in qualitative research and based on collecting data from multiple resources, is considered, along with validity and reliability, as being multiple "ways of establishing truth" (Golafshani, 2003, p. 604).

Validity

Validity, according to Cohen, Manion and Morrison (2007, p. 133) is "the technical soundness of a given study". It means the accurateness and scientific eligibility of the study. Validity is achieved when the researcher finds and presents "trustworthy information" about his/her research topic (Cohen, Manion and Morrison, 2007, p. 133).

Cohen, Manion and Morrison (2007, p.133) have identified several types of validity; those include: content validity, criterion related validity, construction validity, face validity, internal validity and external validity.

In the current study, face validity and content validity were adopted. According to Bernard (2000, p.49) content validity is "achieved when an instrument has appropriate content for measuring a complex concept, or construct". Oppenheim (2001, p.162) supported Bernard's view when he stated that content validity is seeking to "establish that the items or questions are a well-balanced sample of the content domain to be measured". According to Cohen, Manion and Morrison (2007) and Algahtani (2011) the purpose of piloting the instrument is to test and increase its validity and reliability.

In the current study, the validity of the study instrument (the questionnaire) was verified by piloting the questionnaire as it was submitted to academic arbitrators who are lecturers in Jordanian universities. They read the instrument items, commented, and gave their suggestions and opinions about it, to set it in its final form. The questionnaire was modified and finalized, according to the notes received.

Reliability

Reliability is used to test or evaluate "mainly" quantitative and other kinds of research. It is based on the idea of testing the study according to its quality (Golafshani, 2003; Bryman, 2008). Golafshani (2003) discussed that reliability is a criterion which is used to test quality in quantitative research. In other words, reliability is used to test the research's process and final product (results).

Cohen, Manion and Morrison (2007) explained that the instrument is considered reliable when it produces the same data from same respondents over the time. Besides the instrument's reliability, data reliability is also an important aspect in the study and it is related to the dependence of the data which is collected by the researcher. Dependence of the data can be ensured if a test and retest are carried out and same results are obtained within a time span.

To verify the reliability of the current study's instrument, the researcher used the Test and Re-test method, where the questionnaire was distributed to a pilot sample of 20 lecturers who are not included in the real study sample. Test and Re-test includes using the same tests on the same participants on two different occasions (Hartas, 2010). The questionnaire was redistributed after 22 days. The correlation coefficient of the test/retest can be calculated either for the whole test (e.g. by using the Pearson statistic or a t-test) or for sections of the questionnaire (e.g. by using the Spearman or Pearson statistic as appropriate or a t-test) (Cohen, Manion and Morrison, 2007). Pearson's method is usually used to test the relationship between interval and ratio variables.

After that the Pearson correlation coefficient was calculated for both responses and the following results were found:

- Pearson correlation coefficient value for the lecturers' point of view about ICT use in teaching and learning is 0.84.
- Pearson correlation coefficient value for the factors that affect ICT use in teaching and learning is 0.86.

The above results show high reliability and stability of the study instrument. The statistical significance of the correlation coefficient should be 0.05 or higher to guarantee the reliability of the study instrument (Cohen, Manion and Morrison, 2007).

The statistical reliability of the instrument was assessed using Cronbach's alpha coefficient. Cronbach's alpha coefficient, according to Bernard (2000, p.298) is "a statistical test which is used to test the correlation of items with one another". Cronbach's alpha coefficient is used because it is the most suitable type that ensures reliability when the instrument's items have several possible answers (McMillan & Schumacher, 1997, cited in Ishtaiwa, 2006). In addition to that, Cronbach alpha provides a coefficient of inter-item correlations of each item

with the sum of all the other relevant items (Cohen, Manion and Morrison, (2007). Cronbach's alpha was calculated in this study for the questionnaire as a whole and for sections two and three separately. As shown in table1, the results of this analysis are: 0.95 coefficient alpha value for the entire questionnaire, 0.93 for section two, 0.90 for section three. Based on Kerlinger's (1964), Muijs' (2004) and Ishtaiwa's (2006) studies this questionnaire has a very high value of coefficient alpha.

Table 1. Cronbach's Alpha Coefficients for the Survey Questionnaire

Category	Alpha Coefficient
Entire questionnaire	95%
Section two: ICT use	93%
Section three: Factors that affect ICT use	90%

13. Distribution of the questionnaire

The researcher visited the sample universities and met the lecturers and handed them the questionnaire and the official approval letter (appendix 4, 5). A date for returning the completed questionnaire was set with them but most of them were late. After receiving back the questionnaire the data were inputted on the SPSS program and statistical procedures were performed.

14. Data collection

Data collection for this study was conducted in the winter of 2012, with the help of some lecturers in the sample universities, during the months of November and December 2012, and January 2013.

A total of 448 (267 males, 181 females) completed questionnaires were received from the lecturers in Jordanian public universities.

15. Statistical Analysis

The questionnaire used in this study was designed to provide numerical data (quantitative). The numerical data were obtained from 'section A' of the questionnaire about participants' general information. This information allowed me to check if variables such as faculty, experience of teaching, academic rank, gender, age, ICT tools availability have any effect on lecturers' attitudes to ICT use.

Section B of the questionnaire provided numerical data about ICT use in general and attitudes and perceptions in specific. The data have been obtained by the use of Likert scales. Bertram (2004, p.681) defined Likert scales as "A psychometric response scale primarily used in questionnaires to obtain participants' preferences or degree of agreement with a statement or set of statements. Likert scales are a non-comparative scaling technique and are unidimensional (only measure a single trait) in nature. Respondents are asked to indicate their level of agreement with a given statement by way of an ordinal scale".

A correlation was conducted to check out correlated variables which could have the same explanation about lecturers' attitudes, and then ordination of the data by correspondence analysis was carried out to quantify how much variables in the questionnaire explained lecturers' attitudes towards ICT use in teaching and learning.

For statistical analysis I used Statistical Package for the Social Sciences (SPSS, v.15). After obtaining the data I used the following scale: (1-2.33) low, (2.34-3.67) moderate, (3.68-5) high, to determine: ICT use in teaching and learning, the factors that affect ICT use in teaching and learning, the lecturers' feelings about whether or not they are well prepared on using ICT in teaching and learning, and the universities' supporting procedures for ICT use in teaching and learning.

16. Results and Discussions

Table 2. Summary of the results for first question

How do lecturers perceive ICT use in teaching?		
ICT uses in planning	The results show high levels of ICT use in planning for teaching and learning.	ICT use in planning the lessons because it makes things easy, saves time, efforts, and delivers information effectively.
ICT uses inside the lecture room	The results show high levels of ICT use in teaching and learning inside the lecture room.	Lecturers use computers, datashow and overhead projector inside the lecture room.
ICT uses for administrative tasks	The results show high levels of ICT use for administrative tasks.	ICT use in official letters makes things faster, saves paper and ink, and saves times and efforts
ICT uses for Evaluation	The results show high levels of ICT use for Evaluation.	The most common uses of ICT are online testing, scaling the students' performance by computer software, electronic portfolio and email to send and receive feedback.
ICT uses in other areas such as chatting; and e-mails.	The results show high levels of ICT use in other areas such as chatting; and e-mails.	Lecturers use internet to visit the library to search and to read news.

The quantitative and qualitative results on the first question, generally, show high levels of ICT use in planning outside and inside the lecture room, administrative tasks, evaluation and in other uses such e-libraries, emails, e-groups and online chatting. This indicates positive perceptions toward ICT use in teaching and learning. These positive perceptions are developed due to the lecturers' awareness of ICT potentials in teaching and learning, such as convenience, flexibility, capacity, interactivity and speed. There are positive and negative factors associate that use, these factors will be identified and discussed in the next question. It was noticed from the responses on the questionnaire, interviews and focus groups that most of the lecturers have basic ICT skills, since the areas they show in high uses of ICT, such as preparing lessons, plans and exams, data shows and OHP, preparing students' databases, analysing students' results and exchange feedback and e-libraries, do not demand advance skills. Whereas the areas they show weak use of ICT, such as VLE, IWB and creating online exams, require them to use more developed skills.

Table 3. Summary of the results for second question

What are the positive and negative factors affecting the use of ICT in teaching?		
Association of the factors on ICT use	The results showed medium levels of association of the factors on ICT use.	The most dominant factors are: technological infrastructure • training • students skills • incentives • financial support • efficiency of performance • Speed • Automation • Capacity • Interactivity • time-consuming • efforts –consuming • maintenance

In conclusion the positive factors that affect ICT use in Jordanian education are: lecturers' awareness about the benefits of ICT use; availability of ICT infrastructure; availability of technical support; availability of effective training; availability of university support and incentives; sufficient skills of the students and lecturers.

The benefits of ICT use are: saving time and effort; overcoming the time and place limitations; and increasing students' understanding by offering a variety of display channels that overcome individual differences.

On the other hand, the negative factors that affect ICT use are: lack of technological infrastructure; lack of technical support; lack of university support and incentives; lack of time; lack of awareness and training; lack of financial resources, and the social and health effects of ICT use.

Consequences of the negative effects of the factors include: chaos and uncertainty while using ICT; confusion and lack of understanding; failure of effective ICT integration.

Table 4 Summary of the results for third question

What are the effects of the chosen variables (faculty, experience of teaching, academic rank, gender, age)		
Faculty	The results show statistically significant differences regarding the level of ICT use in teaching and learning, associating factors of ICT use, lecturers' feeling about being prepared and universities support of ICT use between Scientific and Humanities faculties.	Lecturers in the scientific faculty use ICT tools, aren't affected by the factors very much, feel they are more trained and supported than the lecturers in the humanities.
Gender	The results do not show any statistical significant differences in the level of ICT use, lecturers' feeling of being prepared and universities support of ICT use in teaching and learning based on the gender variable.	There are no differences between males and females.
Experience	The results show an effect of experience on the use of ICT in teaching and learning. The results show statistically significant differences in the lecturers' responses about if they feel they are prepared to use ICT in teaching and learning. The results don't show any statistically significant regarding the factors that affect ICT use and universities support of ICT use in teaching and learning.	Lecturers how have (0-5), (6-10), (11-15), (16-20), (21- 25) years of experience are using ICT more than those who have (26-30) and more 30 years of experience. Categories (0-5), (6-10) and (11-15) feel they are more prepared to use ICT in teaching than other categories.
Academic Rank	The results show statistically significant differences in the level of ICT use according to the academic rank. The results show statistically significant differences in the factors that affect the use of ICT in teaching	Assistant Professors, Associate Professors and Lecturers use ICT more the full professors. Assistant Professors and Associate Professors are more affected by the

	and learning The results show statistically significant differences in the lecturers' responses about if they feel that they are prepared to use ICT in teaching and learning. The results show statistically significant differences in how the universities support ICT use in teaching and learning	associated factors , feel they are more prepared and receive more support than the Lecturers and full professors
Age	The results show statistically significant differences in ICT use in teaching and learning. The results show statistically significant differences in the factors that affect ICT use in teaching and learning. The results show statistically significant differences in the lecturers' feeling of being prepared to use ICT in teaching and learning. The results show statistically significant differences in the lecturers' responses about the universities support of ICT use in teaching and learning	Generally speaking, the young lecturers use ICT more than old lecturers. The oldest lecturers are more affected by the factors than the youngest lecturers. Young lecturers feel more prepared to use ICT more than old lecturers. Older lecturers are more supported than young lecturers

The results of this question showed that all chosen variables have effect on ICT use in teaching and learning, except gender. The results show that the use of ICT in scientific faculties is higher than it is in humanities. The difference in ICT use levels is due to need to the availability of ICT tools in scientific faculties more than humanities, the weak ICT skills in humanities faculties as students in scientific are more exposed to ICT more, the subjects in scientific faculties depends on ICT more than subjects in humanities. Regarding the effect of gender the results doesn't show significant differences between males and females. Results on teaching experience showed differences in ICT use as lecturers with short teaching experience indicated that they use ICT more than lecturers with long teaching experience. The results revealed that lecturers with short teaching experience were more exposed to ICT use, as they have been using it in schools and universities where have been learning. On the other hand, lecturers with long teaching experience already have their own teaching styles which they cannot change easily. Regarding the effect of academic ranks the results showed differences among lecturers. As lecturers with lower academic ranks showed higher levels of ICT use, this may be because of the job stress they face works as a motivator for them to develop and occupy higher ranks. Regarding the effect of age on ICT the results show that younger lecturers tend to use ICT more than older lecturers. Younger lecturers have been exposed to ICT more while studying, unlike older lecturers who used it later in work, as they have been used to their teaching methods and then forced to change them.

17. Conclusion

Developing teaching and learning has been a rich field of study for some time; many educators investigated the best teaching and learning practices, and many of them added important developments. When the technological revolution happened many decades ago, its effects have reached all life's domains, including the educational domain (Webb & Cox, 2004).When educators and students felt the benefits of ICT use in teaching and learning, intensive studies have been carried out to identify its positives, negatives, the factors that control its use and perceptions towards it. The results of this study as well the other related studies proved that the use of ICT is related to many aspects. One of these aspects is the perceptions toward ICT use. The results of this study showed

that most of the lecturers have positive perceptions about ICT use, as they are willing to learn and use ICTs in teaching and learning (Neno, 2003). This is because they realize its benefits when used outside the lecture room to plan the teaching more effectively, inside the lecture room to increase students' understanding by offering a variety of displaying channels that overcome individual differences, in administration to save time, effort, paper and ink and to prevent losing important documents, in evaluation to save time and effort, to enable lecturers to work effectively and accurately, and to benefit from the large storage that ICTs provide; and in chatting and e-mails to overcome the time and place boundaries, in e-groups to share, save, translate and discuss different topics and in e-libraries which make the searching process easier than using the traditional library.

On the other hand, the lecturers' perceptions are affected by many factors such as the lack of training, lack of technological infrastructure, students' weak skills and motivation (Al-Zahrani, 2005) workload, lack of support, lack of financial resources and incentives, lack of technical support, absence of strategic plan and clear vision (Edwina, 2003; Hamdi, 2001; Thomas, 2000; Mwalongo, 2011; Gulbahar and Guven, 2008). Based on these factors, ICT use is negatively affected and the consequences of this could be chaos and uncertainty, for example, waste of time and efforts, lack of understanding and failure of effective ICT integration.

Regarding the most used ICT tools the results showed that computers, datashows, and overhead projectors are the most used tools, while the other developed tools such as IWB, and VLEs are not much used, because they are still new tools, which means they are not available in all universities and lecturers still don't feel confident about using them.

Not being prepared or not being confident about using ICT in teaching and learning is as a result of the unavailability of training and professional development programs (Chowdhury, 2009). It is obvious that training is related to perceptions; since presenting effective and coherent training for lecturers is important for building positive attitudes toward ICT use. The majority of the lecturers stated that they were trained on how to use basic computer programs (ICDL) but not the more advanced tools, such as IWB for example, because it is still not used widely in education. Other lecturers stated that they are confident in using many tools based on their own experience as they gained the knowledge by self-learning not by training provided by the universities (Giavrimis, Giossi and Papastamatis, 2011). The lecturers stated also that the most important reasons preventing them from attending training courses, if they are available, is the inefficiency; as the offered training courses don't cover what they particularly need to learn, besides giving huge amounts of material which they couldn't master in the limited period of the course. A third reason was the lack of application as a result of the lack of infrastructure and technical support during lecturing (Allision, 2000; Al-Muhaisen, 2000). Results also showed that the workload or the busy schedules of work and social obligations prevents them from attending training courses.

The results do not show any statistically significant differences according to the respondents' gender regarding ICT use in teaching and learning, the feeling toward training and the university support of ICT use in teaching and learning. Nevertheless, slight statistically significant differences were found regarding the factors that affect use of ICT in teaching and learning for the males. This difference is considered slight because the number of male respondents is greater than the number of female respondents which makes the female sample not representative enough.

Regarding the experience, the results revealed that lecturers who have short teaching experience accept, perceive and use technology more than those with longer teaching experience (Mitra, 1999; Abdulrahim and Al Moussaoui's, 2003). This could be because lecturers with fewer years of teaching experience most probably belong to the new generation who are more exposed to ICT, as they used ICT early at schools, universities and within their social context. On the other hand, lecturers with a lot of teaching experience used teaching styles with which they are familiar, and it is not easy for them to convert from their traditional methods to use new ICT based teaching methods.

The results of my study showed statistically significant differences in lecturers' use of ICT as lecturers with higher ranks use ICT less than lecturers with lower ranks (Al Khatib, 2006; Hamdi, 2003). This appears to be because lecturers with lower ranks were exposed more to ICT when they were students and are thus more open to the new developments than lecturers with higher ranks, and although this does not apply to all lecturers, it could affect their use of ICT. Generally speaking, stress which lectures with lower rank face is the motivator that forces them to work harder to develop and prove themselves in the field they work in (Safaria, Othman and Abdul Wahab, 2011).

Regarding age, the results of this study showed that younger lecturers tend to use ICT more than older lecturers, and this agrees with the findings of others (Van and Peeraer, 2000; Mitra, 1999) the younger lecturers (who have short teaching experience and low academic rank) can be seen as ICT natives who have been more exposed to

ICT while older lecturers (who have long teaching experience and high academic rank) are more committed to their traditional teaching methods.

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