Teachers' Attitudes and Perceptions towards the Use of Information and Communication Technology (ICT) in Education and the Effect of Training upon ICT Uptake

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Abstract (ENGLISH)

The teachers' attitude toward ICT is crucial in the implementation of computers as a teaching aid. The purpose of this study was to investigate teachers' attitudes towards the use of ICT and the effect of training upon ICT uptake by them. Three subject teachers from (N) School in Sharjah UAE were selected using a purposive sampling technique. Both qualitative and quantitative data collection methods were used in the study where questionnaires were administered before and after the training; followed by weekly journals after each class for seven consecutive classes. Descriptive statistics were employed for analyzing the quantitative data and weekly journals were transcribed verbatim and then coded. Based on the finding, all the respondents were females with the age range of 20-49 years old. All teachers had ICT training but vary in the duration of the training. Teachers had positive attitudes towards and good competence at ICT and both attributes strengthened after the training. However, teachers' computer perceptions and attributes were between neutral and positive with no significant improvement after the training. In conclusion, although teachers had positive attitudes and good computer competence based on the quantitative data, the qualitative data indicated that their utilization of ICT as a teaching aid is very limited. Future studies are required to explore the causes as to why teachers' utilization is limited despite good attitudes about and competence at ICT. In addition, the causes of low teachers' cultural perception and computer attribute that did not improve after the training should also be investigated. This study was done with three subject teachers all were female working in a suburban school, therefore, future investigations should include schools with various socio demographic characteristics and with a wider variety of subject teachers.

Abstract (ARABIC)

موقف المعلمين نحو تكنولوجيا المعلومات والاتصالات أمر حاسم في تنفيذ استخدام أجهزة الكمبيوتر كأداة مساعدة في التدريس. وكان الغرض من هذه الدراسة معرفة مواقف المعلمين تجاه استخدام تكنولوجيا المعلومات والاتصالات وأثر تدريبهم على استخدام تكنولوجيا المعلومات والاتصالات. وقد تم اختيار ثلاثة معلمات مواد من مدرسة (ن) في الشارقة في الإمارات العربية المتحدة عن طريق استخدام تقنية أخذ العينات الهادفة. وقد استخدمت كل الأساليب الكمية والنوعية لجمع البيانات في الدراسة حيث كانت تدار استبيانات قبل وبعد التدريب، و تلتها كتابة مدونات أسبوعية بعد كل حصة لمدة سبعة حصص متتالية. و قد تم استخدام إحصاءات وصفية لتحليل البيانات الكمية أما المدونات الأسبوعية فقد تم ترجمتها حرفيا و ترميزها.

واستنادا إلى نتائج البحث فإن جميع المستجيبين كانوا من الإناث من الفئة العمرية من 20-49 سنة. و كانت قد حصلت كل المعلمات على تدريب على استخدام تكنولوجيا المعلومات والاتصالات باختلاف مدة التدريب. لقد كان للمعلمات مواقف إيجابية وكفاءة جيدة حول تكنولوجيا المعلومات والاتصالات والتي تم تعزيزها بعد التدريب. و مع ذلك فإن تصورات المعلمات للكمبيوتر و صفاته تراوحت بين محايد وإيجابي مع عدم وجود تحسن ملموس بعد التدريب.

في الختام، على الرغم من أن المعلمات كانت لديهن اتجاهات إيجابية و كفاءة جيدة لاستخدام الكمبيوتر بناء على البيانات الكمية، إلا أن البيانات النوعية اشارت إلى أن استخدام المعلمات لتكنولوجيا المعلومات والاتصالات كأداة مساعدة في التعليم محدودة جدا. لذلك فإن هناك ضرورة لدراسات مستقبلية لمعرفة أسباب قصور استخدام المعلمات للتكنولوجيا على الرغم من الاتجاهات الايجابية تجاه تطبيق تكنولوجيا المعلومات والاتصالات. وبالإضافة إلى ذلك، ينبغي أيضا معرفة أسباب قصور المعرفة الثقافية للمعلمات نحو سمات الكمبيوتر التي لم تتحسن بعد التدريب. و لأن هذه الدراسة قد أجريت مع ثلاثة معلمات تعملن في مدرسة في الضواحي ينبغي أن تشمل الدارسات المستقبلية المدارس بمختلف الخصائص الديموغرافية و الاجتماعية ومع مجموعة أوسع من المعلمين.

Dedication

To my beloved family and friends

Acknowledgments

To my mother, who has always supported and encouraged me.

To my late father who would have been proud of my achievement if he were here.

To my children, Nadine and Nouran, who have put up with all the time I was not there for them.

To Dr. Naz Awan, the best academic role model that I could have wished for. She is a true educator and extremely knowledgeable. She has been a lot more than a supervisor; she was always there for anyone who needed help. Personally, she helped me overcome all the difficulties I faced during this journey.

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Abbreviation

ADEC	Abu Dhabi Educational Council
ATICT	Attitude towards Information and Communication Technology
Cycle 1, 2 & 3	Elementary, Middle & High school (respectively)
DOI	Diffusion of Innovation
GEF	Global Education Forum
GESS	Gulf Educational Supplies and Solutions
ICDL	International Computer Driving License
ICT	Information and Communication Technologies
IT	Information Technologies
KHDA	Knowledge and Human Development Authority
MAG	Madares Al Ghad (Schools of Tomorrow)
MoE	Ministry of Education
PPP	Public Private Partnership
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action

Chapter 1

Introduction

1.1 Background of the study

Information and communication technology (ICT) is defined as a "*diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information.*" [p: 46] These include computers, internet, broadcasting technologies (radio, television and the various services and technologies associated with them, such as video conferencing and distance learning), and telephony (Blurton, 1999).

Defining ICT function is simplified by UNESCO's ICT report on teacher education: '*ICTs can provide powerful tools to help learners access vast knowledge resources, collaborate with others, consult with experts, share knowledge, and solve complex problems using cognitive tools. ICTs can also provide learners with powerful new tools to represent their knowledge with text, images, graphics and video*' (UNESCO 2002:24)

The last couple of decades have witnessed a worldwide proliferation of ICT in the field of education. The economic demand for national development has largely driven the global adoption of ICT into education. ICT in education serves as a knowledge tool and skill base for preparing students for future employment in addition to national economic development (Brandenburg and Dudt, 1998).

According to Harvey (1983), the effectiveness of the use of computer in education may be an important factor deciding which country will succeed in the future. Fundamental to this vision is the powerful metaphor "Information age", where media, business and industry became increasingly computer dependent. The information age has created a whole set of assumptions about the need for education reforms where the new tools will be included (Pelgrum, 2001). Governments' response to this challenge in most developing countries was by instigating national programs to introduce computers into education. Even in developed countries, investments' in ICT kit doesn't guarantee its effective utilization and what impact it will have (Oldfield, 2010).

Benzei (1995) indicated that there was limited success of the national programs because they were started in non-educational fields; moreover, they were not based on research. According to Young (1991) '*computers were introduced into schools not as a means but as an end*' (P: 144 cited in Albirini, 2004). Introducing computers into Education was not supplemented with measures that would enable the users to develop positive attitudes toward the new tools and to use them. Consequently, unplanned approaches were used to solve this issue (Albirini, 2004).

According to Rogers (1995), the initial stage which demands information gathering and planning, seems to be missing in this impetuous process of technology implementation. Moreover, computer availability is usually mistaken for computer use. Badran (2009) stated that although a lot has been invested in ICT infusion, teachers have developed negative attitudes towards ICT adoption for different reasons which serve as barriers to the adoption. Therefore, these reasons must be examined and reversed [see chapter 3].

1.2 Statement of the problem

Effective management is essential for ICT adoption to better prepare the actual users; the teachers (Markus, 1987). Teachers play an important role in ICT adoption as they are the ones who make learning take place. According to Pelgrum (2001), the lack of ICT knowledge and skills can serve as a great barrier to the implementation; therefore, teachers need to get more training (Pelgrum & Law, 2003). Current technology implementation plans focus more on the technology itself rather than the actual user. The users' attitude towards the innovation is a crucial element to success. However, most implementation efforts are not based on research or any information gathering. Furthermore, teachers' attitude which is a key element seem to be ignored both in the planning and implementation processes (Watson, 1998 & Woodrow, 1992 cited in Albirini, 2004).

Despite the fact that teachers' attitude is a primary element, it is more challenging to detect the factors behind these attitudes (Albirini, 2004). To find out the reason behind the discrepancy in the level of ICT adoption by teachers, we need to examine the factors affecting their attitudes (Abu Samak, 2006). Research has highlighted several factors that affect teachers'

attitude namely; computer attributes (Rogers, 1995), cultural perceptions (Rogers, 1995 and & Thomas, 1987), computer competence (Francis-Pelton and Pelton, 1996 cited in Albirini, 2004), computer access (Marshal and Ruohonen, 1998) and computer training (Knezek, Christensen & Rice, 1997).

Although a number of studies have addressed the relationship between ICT adoption and teachers' attitudes, only few have examined this issue in the Arab world. It is worth noting that '*the relationship between these variables and teachers attitude has always been clear and systematic'* [Albirini, 2004. p: 6]. The results of these studies are context-specific due to population, sampling, and /or design limitations, therefore, even if a relationship was found, the findings might not be transferable to the UAE context. A similar study has been conducted in the UAE by Badran (2009), but his study subjects are limited to English as Foreign Language teachers. That is to say, UAE subject teachers may have differing experiences with ICT due to the recent presence of ICT in their schools, their distinct cultural background and the unique nature of each subject area; therefore, this study is valuable to answer these questions.

The purpose of this study was to investigate the UAE subject teachers' attitudes towards ICT in education and then to examine the relationship between teachers' attitudes and factors that are thought to be influencing them, including cultural perceptions, computer attributes, computer access and teachers' socio-demographics. Both quantitative (questionnaire) and qualitative (weekly journals) procedures were used. The study focused mainly on Physics, Chemistry and Geography teachers.

1.3 Research Questions

This study examines the relationship between teachers' attitudes towards ICT uptake and the factors affecting these attitudes. This study was conducted to investigate the following questions in the UAE context: (a) What are the attitudes of subject teachers in the UAE towards ICT in education, (b) What are the perceptions of computer attributes, cultural relevance of computers to UAE society and schools, their level of computer competence and their level of access to computers. (c) What is the relationship between teachers' attitudes towards ICT in

education and their perceptions of each of the above variables as well as teachers characteristics. (d) And what is the effect of training upon ICT uptake?

1.4 Significance of the study

Research has documented that teacher's attitudes towards a new innovation is a major element upon which the adoption depends. It has been suggested that unless teachers could see the benefit behind using the innovation for them and for their students, they will not use it (Teo, 2008). Unquestionably, teachers are the ones who '*determine when, where, and how to use these tools in the class room environment*' [p: 8]. It is crucial that teachers develop positive attitudes towards the new technologies, otherwise the energy and money invested in the implementing ICT can be fruitless

It is worth noting that there are few studies which tackled the use of ICT by teachers in the Arab region, the Middle East in particular. Moreover, the studies done in the field examined the attitudes of the EFL teachers and ignored teachers of other subject areas who are the majority of the teacher population in the UAE. This study can contribute to the research that will be done in this regard.

Empirical research of *'the pedagogical, psychological and cognitive barriers to the successful use of information technology is a vital precondition for improving the utilization of computers and other technological aids in the educational process'* (Benzie, 1995:39 cited in Albirini, 2004). This study can highlight the barriers to the adoption of ICT which can serve as a pre-stage to planning for infusing the innovation. Therefore, negative consequences could be avoided especially in developing countries where the technology infusion into schools is recent.

Last but not least, the investigation can contribute to the existing body of literature on the integration of technology in developing countries.

1.5 Limitation

Like any other study, this study has its own limitation. The scope of this study is limited to the Chemistry, physics and Geography female teachers in suburban areas and those who held a Bachelors degree. Teachers' attitude towards ICT in other sections of education such as elementary, college and universities and with different sociodemographic status are not considered. The result of this study may apply to the majority of UAE subject teachers working in public education due to the similarities among these teachers. Moreover, the data collection tools were administered in Arabic to eliminate any cultural bias. The findings may not be generalized to private schools and others with different socio-demographic status.

1.6 Basic Assumptions

The researcher believes that the responses of participants involved in this purposive sampling represent those subject teachers constituting the population of the current study. It is assumed that the selected subjects are able to describe their attitudes and perceptions according to the study questionnaire. It is further assumed that the participants will be honest in their responses to the questionnaire item and the weekly journals.

CHAPTER 2

Literature Review part 1

ICT in Education

This chapter displays the literature review related to the theoretical framework of this study. It begins with the development of ICT around the world. It highlights the educational reform in the UAE and the importance of ICT to the UAE's educational system. Moreover, it focuses on Roger's Diffusion of Innovation theory (1995) which is most appropriate for a study of this nature.

2.1 ICT in Education (Inauguration)

In the pursuit to improve education, countries around the world invest in Information and Communication Technologies (ICT). ICT refers to technologies used to process and communicate information such as: radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, computer networks, hardware and software. ICT also includes the gear and services related to these technologies, e.g. Videoconferencing, e-mail and blogs (UNESCO, 2005) which are used to communicate, create, disseminate, store and manage information (Blurton, 1999).

The interest in ICT has been driven by economic and political factors (Bromley, 1998), especially the considerable shifts in the adoption of technology by entertainment and business sectors (Flintoff, 2005). In the 1960s, computers were provided for schools, in an attempt to resolve the American Education problem but the actual use of computers in schools was minor due to high cost and accessibility issues (Alessi &Trollip, 2001 cited in Albirini, 2004).

When computers were introduced into education, they were used to teach computer programming. It was not until the early 1970s when microprocessors were invented, that affordable microcomputers were rapidly introduced into schools (Paul, 2002). Introducing ICT in education during the 1980s was meant to bring changes to the education system. However, researchers agreed that it did not. (Law et al., 2000, Lankshear, Snyder and Green, 2000, cited in

Pelgrum, 2003 cited in Badran, 2009). The mid 1990s indicated the beginning of the Internet and the World Wide Web and was considered as a learning opportunity and a source of information (Albirini, 2004). It is worth noting; the rapid rise of Internet connectivity in the UK and around the world and this is obvious in the BESA survey.

	June 1998	June 1999	April 2000
Primary	34	58	75
Secondary	87	95	97
Special	N/A	68	84

Table 1: Percentage of schools connected to the Internet 1998 – 2000 (Savage, 1999 cited in Abbott, 2001)

2.2 ICT in the UAE:

In the Arab world ICT policies have been driven from the top down and tend to have more focus on technical rather than pedagogical support (Sultan, 2002, Makrakis, 2002).Research has shown that countries' expectations and investments in ICT are high in relation to the actual use of ICT in the classrooms (Makarakis, 1997 cited in Makrakis, 2002).

In public schools in the UAE, IT is mainly taught as a curricular subject by specialized IT teachers where students learn about Microsoft Office software. The purpose of the current study was to investigate teachers of all subjects' abilities to use ICT as an instructional tool and determine their attitude towards the new initiative.

The UAE ministry of Education (MoE) is progressively committed to the integration of ICT in its educational system and this step is crucial for educational reform and innovation. The current education reform in the UAE is Vision 2021 which clearly states that '*The school will not confine its role to transferring knowledge. It will go beyond this to prepare the learner for the future, teach him/her how to learn, work, live and co-exist with othe*r' (MoEY 2000, p. 63 cited in Makrakis, 2005). Vision 2021 was a long term policy targeting "developing the curricula and system of public schools to keep pace with rapid developments in education worldwide. In order

to achieve this, it prescribed 26 projects that had to be completed by 2020." (Gulf News, February 21, 2001 cited in Badran, 2009).

MoE Vision 2021

- Overhaul of infrastructure to promote the use of technology in the development of education.
- Establishing technology training programs for teachers.
- Building cooperation between the Ministry of Education and Youth and other technology institutions here and abroad.
- Exchange of international and regional experiments on education and technology.
- Adopting a clear vision on the type and methods in implementing technology in education and finding a balance between priorities in the development of the education system and providing trained manpower.

Figure: 1: Ministry of Education 2021 Vision (Source: Gulf News, May 17, 2001 taken from Badran, 2009: 10)

All stakeholders and components of the internal environment must function in a way that supports the new vision to achieve the desired goals (Makrakis, 2005). In 2004, the MoE at the time made a new educational approach where the student is at the center of the teaching learning process. Therefore, new curriculum and teaching methods must be used (Makrakis, 2005). The educational system in the UAE includes other bodies outside the schools such as; educational zones, communities and larger society, which is the external environment Makrakis, 2005). The management system of the MOE was central. In this hierarchy, schools cannot make decision related to any school aspects; they came last where everything has to go through the educational zones (Badran, 2009).

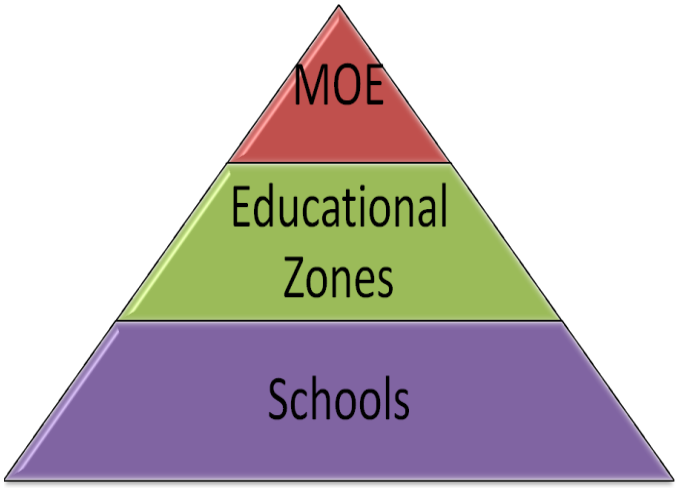


Figure: 2 The Old Hierarchy taken from Badran, (2009: 11).

Decentralization started to take place and subsequently added more authorities to educational zones. Moreover, educational councils were created such as ADEC (Abu Dhabi Educational Council). Educational Councils have a separate budget which is spent on local education initiatives e.g. partnership schools in Abu Dhabi while the MOE supports other initiatives in the Northern Emirates (Sharjah, Ajman, RAK, Fujairah, UAQ and Dubai). Dubai is one of the Northern Emirates, the Knowledge and Human Development Authority (KHDA) was established to fulfill similar goals to those of ADEC. KHDA provided teachers in Dubai with IT training to acquire the ICDL (International Computer Driving License). The rest of the Emirates did the same and obliged teachers to obtain the ICDL as a requirement for contract renewals (Badran, 2009). At the 2009 Gulf Educational Supplies and Solutions (GESS) and Global Education Forum (GEF), His Excellency Dr. Hanif Hassan, the former UAE's Minister of Education said that the UAE represents a platform for technology innovators [A].

The UAE started a major education reform program in 2007. The project is called Madares Al Ghad (Schools of the Future), which is carried out in 50 public schools in all education cycles (1, 2 and 3). This move was in response to globalization and with directions from His Highness Shaikh Mohammad Bin Rashid Al Maktoom, Ruler of Dubai (MAG, 2007). The aim was to provide all fields with a workforce that is equipped with science and knowledge. ICT was one of the objectives of this program (MAG, 2007).

2.3 Teachers, ICT and Innovation

For the last two decades, the use of ICT became the interest of educational systems worldwide. Despite the fact that a lot of financial support was invested in ICT along with proper training pre and in service, surveys show that around 60% of the teachers in Britain still make little or no use of ICT in their teaching(Harrison et al, 2002 cited in Haydn & Barton, 2007& Castillo, 2006).

Business organizations and commercial products have resulted in developing certain theories and models of ICT uptake acceptance which might differ in education (Bates, Manuel & Oppenheim, 2007). Teachers, the end users of the technology, should be considered when starting any initiative. There are basic principles in the acceptance theories which can be considered applicable in all sectors; adopters' characteristics and motives, innovation's benefits, costs and learning curve, and the factors related to the organization's culture and services (Bates, Manuel & Oppenheim, 2007).

2.4 ICT Acceptance Models:

2.4.1 The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed by Davis et al. (1989). This model explains computer users' behaviors and attitudes towards computers and the reasons related to those behaviors (figure 15 [B]). The basis on which TAM was developed, was Fishbein and Ajzen's (1975) Theory of Reasoned Action [see chapter 3.2]. TAM was developed as one of the most significant models in ICT research (Malhotra and Galletta, 1999 cited in Darus and Luin, 2008). For further discussion [B].

2.4.2 Diffusion of Innovation (DOI) Theory:

Rogers' DOI provides theoretical guidance for the current study which explores the attitudes ushering from the uptake of ICT by teachers in the UAE. Rogers, 1995 founded this theory on a meta-analysis of 2,585 empirical studies. This model was used as a framework for 3.890 research studies to examine uptake of new ideas (Rogers, 1995 cited in Albirini, 2004). According to Rogers's definition (1995), diffusion has four main elements; innovation, communication channels, time and social system which determine the process of change in individuals, decision makers, or whole organizations. Using this model, teachers are unquestionably a main agent of change in education (Pelgrum, 2001).

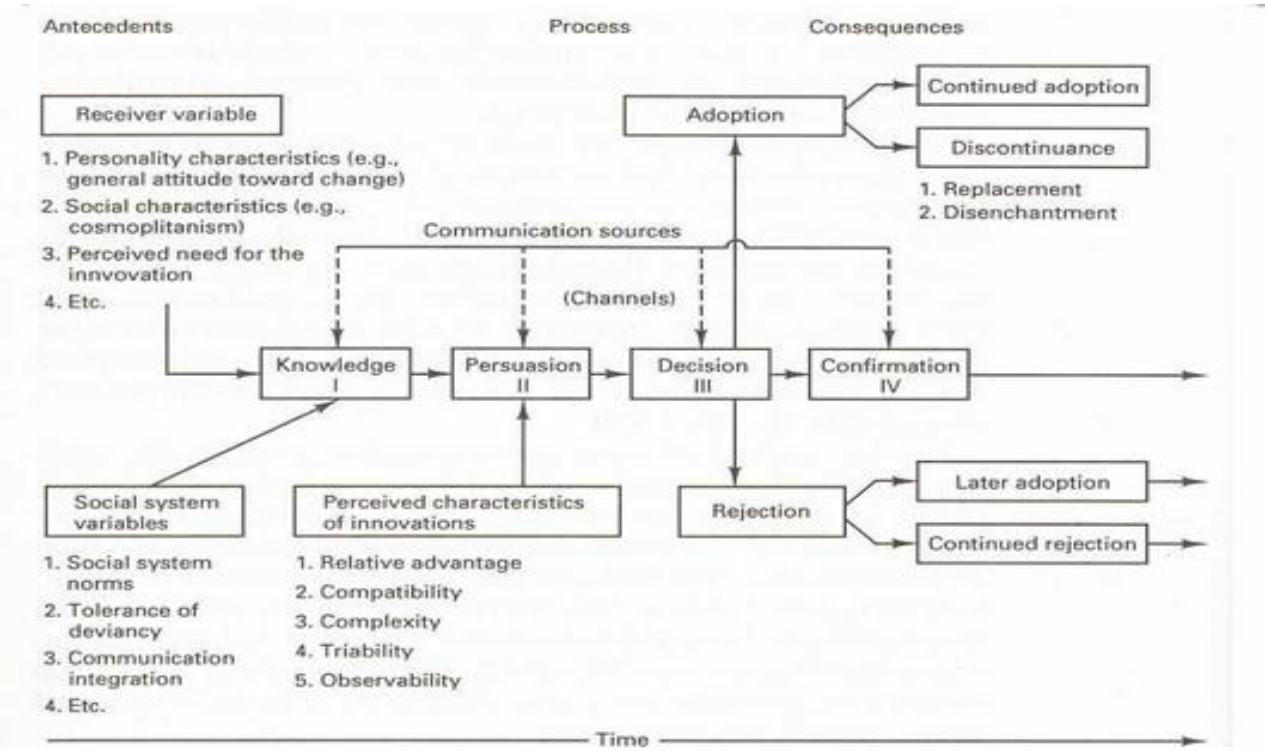


Figure 3: Diffusion of Innovation Model, Rogers (1995)

The innovation decision process marks the steps taken by an individual starting from awareness of the innovation, through the creation of an attitude towards the innovation, then the decision of whether or not to implement the innovation, and finally confirmation of the approach (Bates, Manuel and Oppenheim, 2007).

Perry (2006) classified the innovation characteristics into five criteria; compatibility, complexity, observability, relative advantage and trialabilty. Compatibility refers to the degree an innovation is consistent with the system's values, needs and past experience. Complexity refers to the degree an innovation is thought to be difficult to use. Relative advantage refers to the degree an innovation is thought to be more useful than an existing one, while observability is how the advantages of an innovation are observable. Finally, trialability is the degree to which an innovation can be tried before making a final decision about its adoption or rejection (Rogers, 1995).

Diffusion studies show that most individuals base their judgment of the innovation, on the subjective description of those who may have experienced the new media, which explains how diffusion is a social practice (Rogers, 1995). Rogers (1995) defined the social system which is an important parameter in the innovation diffusion process as a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal. The structure of the social system affects diffusion in many ways (Albirini, 2004).

This study will investigate the innovation attributes which are relative advantage, compatibility, complexity and observability, and the teachers' cultural perceptions, personal characteristics, computer competence and level of computer access. It is worth noting that trialability was not included in this study as teachers did not have a chance to experiment with ICT and make decisions about it. For the purpose of this study, Rogers' Diffusion of Innovation theory (see figure 4) was employed as a theoretical framework for investigating ICT uptake by MOE teachers in the United Arab Emirates. This study examined key elements of the current innovation (ICT) to determine the degree to which the implementation was successful.

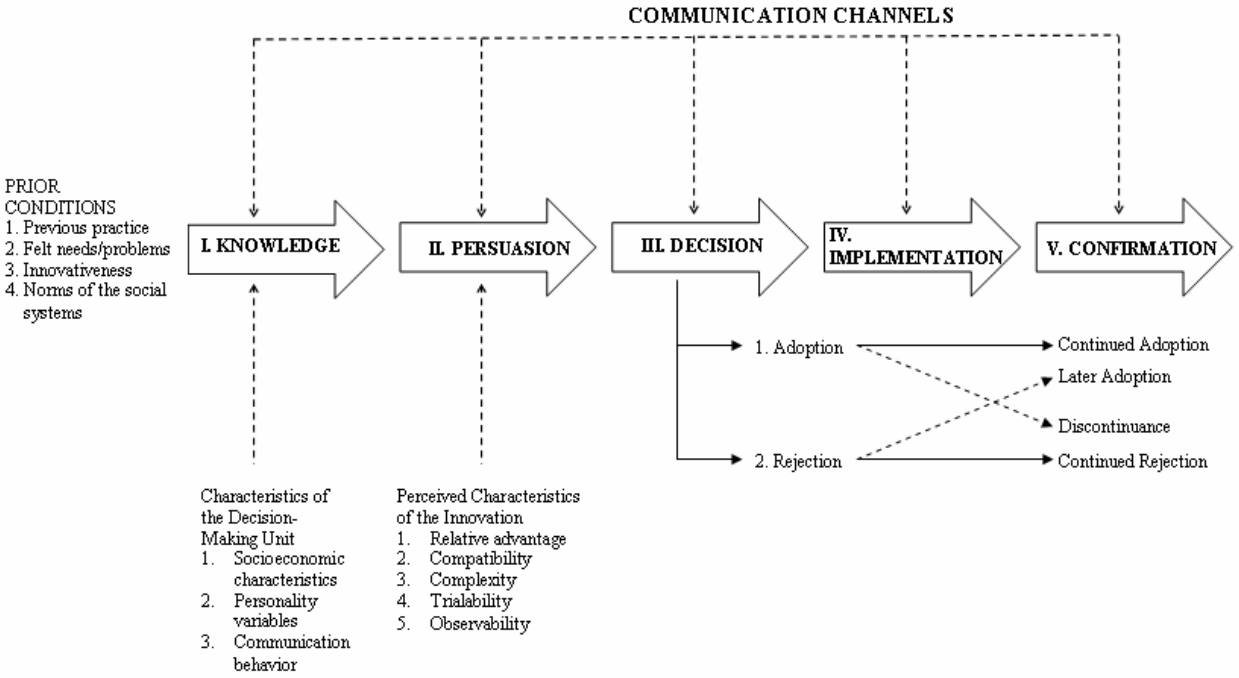


Figure 4: Stages of Innovation-Decision Process, Rogers (1995)

Chapter Three

Literature Review part 2

Obstacles and Enablers to ICT uptake by teachers

Over the past 20 years, research findings provided proof of the positive effects of the use of ICT in education. However, despite the investments in schools and the diverse initiatives by governments, the ICT uptake was disappointingly slow (Cox et al. 1999; Passy &Samways, 1997 cited in Mumtaz, 2000). This chapter provides a comparative analysis of similar studies conducted in other countries in the Middle East. It also discusses one of the attitude models which is Ajzen's model of reasoned action (Ajzen and Fishbien, 1980). Then ICT adoption enablers and obstacles are explained which helped in answering the research questions [1.3]

3.1 Comparative analysis of similar studies

The use of ICT in education has been the focus of several studies in the Middle East. In 2009, Badran conducted a study in public schools in the UAE that explored the effect of the provision of sustainable ICT training on teachers and how that changed their attitudes towards ICT uptake. The researcher collected data before and after the training. The findings of the study showed a positive shift in teachers' attitudes towards ICT. The study also identified three main factors that affect the degree to which teachers adopt ICT within UAE government schools; sustainable in-service training, access to ICT's and sustainable ICT guidance and technical support.

Abu Samak examined Jordanian teachers' attitudes towards ICT in 2006. This study was a replicate with extension of a research by Albirini 2004. She used Roger's (1995) Diffusion of Innovation theory and Ajzen and Fishbein's Model of Reasoned Action (1980). In 2004, Albirini conducted a study investigating the attitudes of EFL teachers in Syria in relation to computer attributes, cultural perceptions, computer competence, computer access, and demographic variables. The researcher used Roger's (1995) Diffusion of Innovation Theory and Ajzen and Fishbein's (1980) Model of reasoned Action as his theoretical framework. The results of the

study showed that participants had positive attitudes towards ICT. They had moderate positive perceptions of computer attributes while they were impartial about cultural relevance. Contrariwise, Syrian teachers showed low levels of computer competence, access and limited in-service training. The current study explained the existing use of ICT by teachers in the UAE which is another country in the Middle East. It provides a factual insight of the current status and an indication for future initiatives.

3.2 User acceptance of ICT

The end-user resistance to change is a pervasive problem therefore, we need to better understand why people accept or resist change, and in this case, ICT. Davis et al. (1989) developed the Technology Acceptance Model [see chapter 2.4.1] based on Ajzen and Fishbein's Theory of Reasoned Action (TRA) which is a model that was originated in the field of social psychology. This theory provides a structure to examine the relationship between attitudes and behavior (Abu Samak, 2006). TRA specifies the relationship between beliefs, attitudes and behaviors. An individual will perform a task if the expected outcome is agreeable with his beliefs (Blue, 1995).

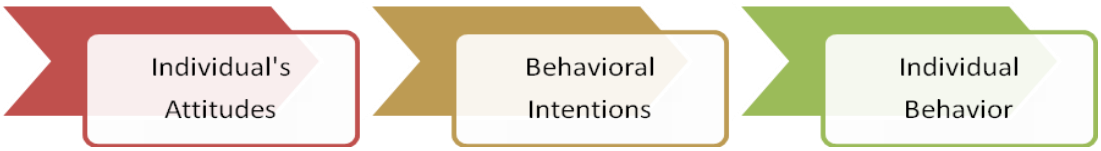


Figure 5: Theory of Reasoned Action

This model helps us understand the relationship between one's attitudes and core beliefs. According to Ajzen & Fishbein (1975), attitudes can be assessed as the sum of the individual consequence x desirability assessments for all expected consequences of the behavior. TRA assumes that there is a relationship between attitude and behavior; they affect each other (Zimbardo et al., 1977 cited in Albirini, 2004). They suggest that affect, cognition and behavior

make up attitudes. According to Ajzen and Fishbein (1980), these three components must be assessed to get a complete description of attitudes by obtaining measures of all three response classes. TRA can be expressed as an equation:

BI = (AB)W1 + (SN)W2
BI = behavioral intention
(AB) = One's attitude toward performing a behavior
W = empirically derived weights
SN = one's subjective norm (Hale, Householder & Green, 2003).

Some researchers like Sheppard et al. (1988) and Hale et al. (2003) disagree with this theory on the basis that it has ignored other very important behaviors. Sheppard et al. (1988) state that there are three limiting conditions on the way intentions are predicted based on the use of attitudes and subjective norms, and how a behavior is predicted based on the use of intentions. The limiting conditions are goals vs behaviors where they make a distinction between a goal intention and a behavioral intention, the choice among alternatives as the existence of other choices can change the intention dramatically, and the intentions vs estimates where they make a distinction between what one intends to do and actually expects to do. Hale et al. (2003) claim that the TRA theory excluded a wide range of spontaneous, impulsive and habitual behaviors and it assumes that people always control their own behavior.

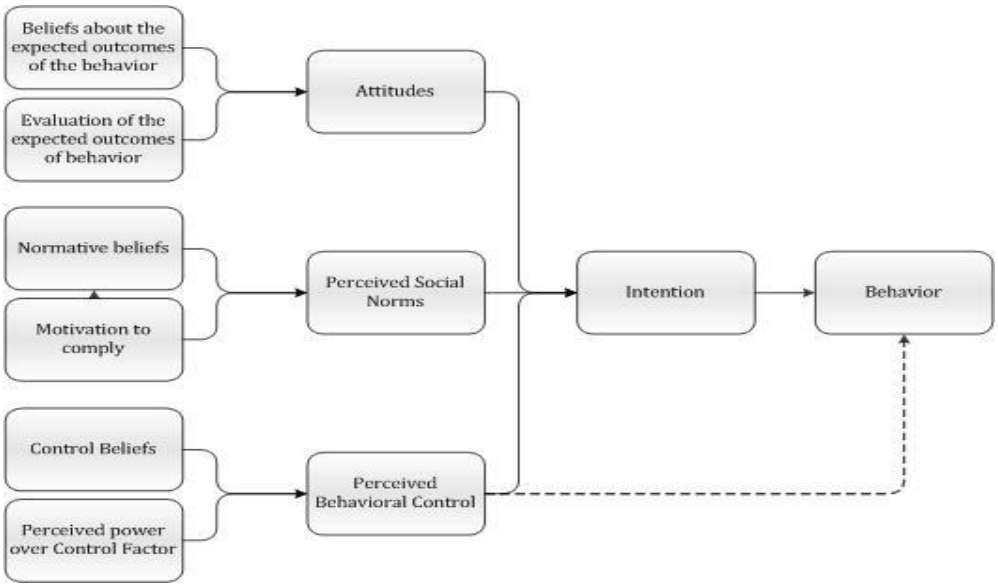


Figure 6: The theory of planned behavior. Taken from: http://socyberty.com/psychology/theory-of-reasoned-action-and-theory-of-planned-behavior/

Ajzen revised his theory and extended it by adding another significant predictor to the model which is perceived behavioral control. This modification was made to explain when people intend to perform a behavior, but that behavior is prevented from being accomplished because they lack confidence or control over behavior. This became the Theory of Planned Behavior (Miller, 2005).

Both theories have established that the intention to behavior is a moderator between attitudes and actual behavior. However, intentions are not always translated into behavior. Also, not all attitudes become intentions (Gollwitzer, 1993). An attitude can be defined as '*the predisposition of an individual to evaluate some symbol or object or aspect of his world in a favorable or unfavorable manne'* (Halloran 1970: 20 Cited in Badran, 2009: 32).

Unfortunately, most of the research done in the field of teachers' attitudes towards ICT has given little consideration to the end-users and more focus on the machines. Researchers have realized that in spite of all the efforts exerted in supplying schools with technology, teachers still make little or no use of it. Therefore, user's acceptance has been identified as a significant factor

in ICT uptake that consequently affects teachers' attitudes which in turn affect the successful use of the tools in the classroom (Koohang, 1989 citen in Albirini, 2004).

3.3 Factors affecting teachers' attitudes towards ICT

Teachers' attitudes were ignored although it became evident that in order to use ICT effectively in the classroom, teachers must have positive attitudes towards the change (Cavas et al., 2009). There are five important reasons for teachers to use ICT in education; motivation, unique instructional abilities, better productivity of teachers, necessary skills for the Information Age and support for new teaching technique (Roblyer and Edwards, 2000 cited in Abu Samak, 2006).

The teachers' role and influence cannot be undermined when it comes to successful implementation of technology in the classroom (Albirini, 2004). According to BECTA (2003: 1), a barrier is defined as '*any factor that prevents or restricts teachers' use of ICT in the classroom'*. In a study by Tella, et al. (2007) cited in Lau & Sim (2008), several factors were found which affect teachers' use of ICT; insufficient knowledge to evaluate the role of ICT and lack of skills to use ICT which resulted in low confidence levels (Preston, 2000, Bradley and Russell, 1997 cited in Lau & Sim, 2008). Thus, teachers should be equipped with the necessary skills they need to use ICT. Furthermore, a proper training on how to integrate ICT in their instruction should also be provided (Yucel, et al., 2010). Barriers have been divided into two categories: extrinsic and intrinsic barriers (BECTA, 2003, BECTA, 2004, Bingimals, 2009, Mumtaz 2000). Figure (7) provides a summary of the barriers found. The study concluded that barriers interrelate and may cause each other (Badran, 2009).

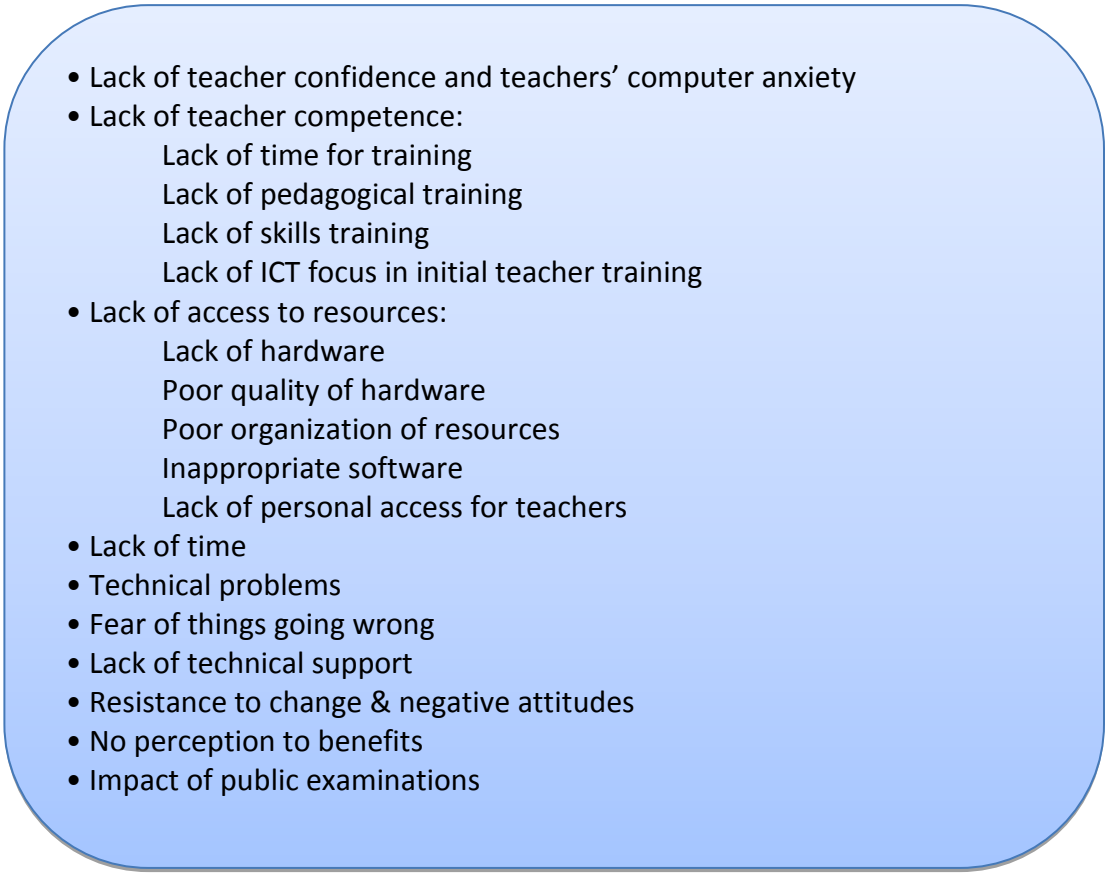


Figure 7: Teacher Perceived Barriers to ICT. (BECTA, 2004 cited in Badran, 2009: 35)

3.3.1 Computer Attributes

Rogers (1995) described five major attributes of an innovation that may contribute to the acceptance or uptake of an innovation: relative advantage, compatibility, complexity, observability and trialibility. The relative advantage is the concept that an innovation is better than its precursors. Compatibility is the degree to which an innovation is consistent with context of the social system, existing values, past experience and needs of the adopters. Complexity is how difficult an innovation is perceived to be. Observability is the degree to which advantages of the innovation are observable to others. Finally, trialibility refers to the degree to which an innovation can be experimented before using it (Bordbar, 2010).

For the purpose of this study, only four of the five attributes will be used because they relevantly suit the participants of this study. Trialibility will not be used because teachers in this

context do not have the chance to experiment with the innovation before making any decision about whether to use it or not or even participate in decision making. Trialibility was excluded by Sookanan (2000) cited in Albirini, (2004), as well as Albirini (2004), Abu Samak (2006) and the present study because teachers were not able to experiment the innovation before making the decision either to adopt or reject it.

The majority of studies have found that the relative advantage is positively correlated to adoption (Teo & Tan, 2000, Premkumar & Ramamurthy, 1995 cited in Pelsak, et al. 2010). Nevertheless, other researchers found that relative advantage was more significant for men, but not for women (Ilie, et al., 2005 cited in Pelsak, et al. 2010). Compatibility which is the second attribute, in some discussion research, was seen similar to relative advantage although they are different as concepts (Sahin, 2006). If an innovation is compatible with an individual's needs, the rate of adoption will increase unlike the feeling of uncertainty which will decrease. Peslak, et al. (2010) conducted a study examining the diffusion of innovation in social networking behavior. It was found that compatibility with lifestyle influenced the use of social networking.

Complexity affects the rate of adoption. That is, if the innovation is perceived to be complex, the adoption rate will decrease (Rogers, 1995). Previous studies on the adoption of innovations showed that the adoption of complex technologies needs certain technical competencies in the adopters (Alam, et al. 2007 cited in Golding, et al. nd.). Observability, was found to have a positive relationship with the rate of adoption (Rogers and Shoemaker, 1971, Sooknanan, 2002 cited in Bordbar, 2010). To conclude, as the literature indicated, there is a positive correlation between computer attributes and teachers' attitudes towards the adoption of ICT. That is to say, if teachers perceive the innovation as useful, compatible, easy to use and observable, then it is more likely that their acceptance level will be high.

3.3.2 Cultural Perceptions

Cultural perceptions are significant elements which need to be taken into consideration when implementing ICT innovations. Rogers (1995) states that few studies have considered the influence of people's cultural perceptions on their adoption of ICT innovations. In an attempt of Cuban (1993) to provide an explanation as to why new technologies have not changed schools as much, he explained that:

> '*Cultural beliefs about what teaching are, how learning occurs, what Knowledge is proper in schools, and the student-teacher (not student-machine) relationship dominates popular views of proper schooling'* (Cuban, 1993: 321)

Culture may play an important role as an influential factor on ICT implementation and on how teachers relate ICT to their beliefs (Rogers, 1995). The social system is the context where the diffusion of innovation occurs. Therefore, the structure of that system affects the diffusion. Although culture perception is a major factor that might affect ICT adoption, it is under-researched.

The COST268 Workgroup on Cultural differences cited in Thomas, et al., (nd) identified the cultural variables affecting ICT adoption as shown in the table below.

Social structure	Time structure	Social values	communication	Material culture
-Social homogeneity -Egalitarian structures -International communication -Ethnicity -Generational cultures -Gender -Religion -Education & Literacy -Language	-Subjective experience of time -Time use structures and expectations	-Openness to technological innovations - Individualism	-Communication forms -Patterns and expectations -Low context vs. high context	-Spatial layout Of the settlement system -Housing artifacts and cultural tastes

Table 2: Cultural variables affecting ICT adoption, Thomas et al. (nd.)

3.3.3Computer Competence

Besides computer attributes and cultural perceptions, previous research shows that computer competence is among the factors that affect teachers' acceptance of innovations. There is almost consistency amongst researchers that computer competence has a positive effect on participant's attitudes towards technology (Liu, 2009). In a study by Wong et al. (2003) cited in Sa'ari, Luan &Roslen, 2005), it was found that teachers with moderate competency or competent teachers in using ICT could perform tasks with some assistance. Consequently, this hands-on activity could increase teachers' positive attitudes towards ICT (Motter, 1995 cited in Sa'ari, Luan & Roslen, 2005). Teachers' actual competence levels should be considered when integrating ICT. The most important finding was that if the software matched the teacher's pedagogy they used it (Mumtaz, 2000).

3.3.4 Computer access

Computer access remains a key concern. Computerization has widely spread across all sectors in countries around the world including education. Therefore, in an attempt to improve the teaching and learning process, schools were equipped with a big number of computers. Conversely, the ICT uptake was not up to expectations due to different reasons. Researchers have found that barriers that affect ICT uptake are classified into two groups; first-order barriers and second-order barriers (Akcaoglu, 2008).First order barriers include access, time, support, resources and training. Second-order barriers include attitudes, beliefs and resistance which are more difficult to change (Earle, 2002).

The European Schoolnet (2006 cited in Kent, 2010) conducted a research where seventeen studies carried out within Europe were reviewed. The study reported that teachers who have had access to their own laptops and received training had more positive attitudes. The findings also indicate that teachers' collaboration in curriculum planning was supported by access to fast, reliable broadband connections. A significant correlation was found between computer access and attitudes toward computers (Marsshall and Ruohonen, 1998, Pelgrum,

2001, Na, 1993 cited in Albirini, 2004). However, in some studies, access to computers did not correlate with teachers' attitude which means that if other conditions in the process of ICT infusion are met, then access becomes important (Albirini, 2004).

3.3.5 Adopter's characteristics

Many studies have investigated the relationship between teachers' characteristics (age, gender, education level, socio-economic status, experience, training and specialization) and their use of ICT (Albirini, 2004; Abu-samak, 2006; Wozni, Venkatesh & Abrami, 2006). In a study by Akcaoglu, (2008), it was found that teachers' personal characteristics affect their use of computers and that ICT training and pre-service coursework should be considering the differences between individuals. However, in some studies, no significant difference existed between the use of ICT and demographic characteristics (Less', 2003 cited in Sahin, 2006).

3.3.5.1 Gender and ICT

Gender was identified as one of the critical factors that affect teachers' attitudes towards using computers. The relationship between gender and computer use has been studied by several researchers i.e. Lu, 2002; Loyd & Gressard, 1984; Zidon& Miller, 1990; Krendl, 1987 and Kay, 1989 cited in Buntat et al. 2010). There is no consensus among researchers about the effect of gender on ICT use (Teo, 2008). Female teachers were reported to have used computers for instructional purposes than male teachers while male teachers used it more for creative, analytic, expansive and communicative purposes (Wonzi, Venkatesh & Abrami, 2006).

3.3.5.2 Age and ICT

Lau and Ang (1998) and Roussos (2007) found no significant relationship between age and teachers' attitudes towards computers (Kent, 2010). Albirini (2004) explains that older teachers may have had less exposure to computers than younger teachers who may have been exposed to computers through their high school education or college study. Therefore, it may be

challenging for some older teachers to learn how to use computers and consequently, this might affect their attitudes towards the technology. In a study by Jennings and Onwuegbuzie (2001), younger teachers were found to have more positive attitudes towards ICT (cited in Lau and Sim, 2008). This agrees with the U.S. National Center for Education Statistics' report (2000) which states that younger teachers score higher on their perception of ICT (Lau and Sim, 2008). Contrarily, Spiegel (2001) cited in Abu-samak (2006) found that age was not significantly correlated with attitudes towards computers.

3.3.5.3 Experience, training and ICT

Lore (1996) reported that there is a negative relationship between teachers' computer experience and the degree of anxiety towards using the computer. Moreover, it was also found that a strong positive relationship existed between the years of computer experience and the teachers' confidence levels. Wong et al. (2003) support these findings stating that teachers with computer experience find IT useful, therefore building greater confidence (cited in Sa'ari, Laun & Roslen, 2005). Additionally, some studies found a significant positive relationship between user's computer experience and computer self-efficacy (Lin &Tu, 2010). Computer experience was investigated in relation to other variables like; learning styles, age, gender, culture, subject area, educational level and type of school (Yang, Mohamed &Beyebach, 1999 cited in Cavas, et al., 2009). It was found that teachers' attitudes changed positively after receiving formal training about computer use.

Several studies emphasized the importance of training in relation to attitudes towards ICT. Yucel et al. (2010) suggested that teachers should be equipped with the necessary skills they need to use ICT. Moreover, teachers need to be trained on how to integrate ICT in their teaching which means that the training should include education and pedagogy (Lawson and Comber, 2000 cited in Cavas et al. 2010).

The literature reviewed here highlights the importance of the end users' attitudes in adopting an innovation. The literature indicated a very critical fact; policy-makers have primarily focused on how well the technology is used and ignored adopters' attitudes. The adoption attempt under investigation in this study has been started hastily in an attempt to create better education [see chapter 4.] which is typical in developing countries as indicated by technology adoption initiatives' history. Hence, teachers were ignored in making any decisions related to ICT adoption. It was elicited from the literature that more studies are needed to investigate this issue and the factors affecting their attitudes. As mentioned above, a number of factors are involved in creating a certain attitude and these factors were examined in the context of the UAE. Chapter 4 expounds the methodology used to carry out the study.

Chapter 4

The present study

4.1 Overview

The purpose of this study was to investigate the factors that affect teachers' attitudes towards the use of Information and Communication Technology (ICT), and the effect of training upon ICT uptake by teachers in the UAE. The study is sought to determine the relationship between teachers' attitudes towards ICT and a number of related variables, e.g. ICT attributes, cultural perceptions, teachers' competence, ICT level of access, and teachers' characteristics.

This chapter discusses the research questions for this study, and an explanation of the methodology used, including a description of the population under study and the instruments used. It also highlights the data collection methods and the data analysis techniques. The sections include: Overview, research design, variables, population, sample size and sampling procedures, instrumentation, data collection and data analysis procedures.

4.2 The present study

This research was conducted to explore teachers' attitude and perception towards using ICT in education. In order to achieve these objectives, the researcher arranged and conducted data collection using a structured questionnaire for three different discipline teachers before and after the training. Specifically, the Geography, Chemistry and physics subject teachers.

To demonstrate and describe a change and reveal the effectiveness or failure of a teaching tool there has to be an initial level and succeeding level where the researcher studied whether the training programme was successful or not. A quantitative approach of pre-test and post-test was used for this reason. Therefore, the selected teachers responded to a structured questionnaire at the beginning of the research to obtain their demographic information and to assess their ICT skills and to help to identify the level and scope of their training [C] and then training was provided. After the training on ICT, the same ICT questionnaire was later repeated in order to

detect changes in the teacher's attitude and perceptions and factors associated with the change, if any changes were available.

A weekly journal was also retained by the researcher [D] after each class visit for a total of seven times. This was to record the training experiences, passing observation and subjective impression by the teachers after each class. These were unplanned in order to quote them in the data analysis. This record facilitated monitoring of the events and thoughts of the researcher and those of the study participants for evidence and evaluative purposes. Then, the journals were reviewed with regards to ICT role in education.

4.3 Research Design: Action research

As the name suggests, action research (Smith, 2007) is a methodology with a twofold aim; action and research. The action is to bring about some change in a community, organization or program, and research is to increase understanding on the part of the researcher or the client or both.

The development of action research as a methodology is credited to Lewin (1946). He first found that experimental methods, in many cases, were inadequate and unsatisfactory. He then tried to seek for a method that is based on people's real world experience; from that time on, action research has entered the world of researchers.

Action research (O'Brien, 2001) is known by many other names, including participatory research, collaborative inquiry, emancipator research, action learning, contextual action research, but all are a variation on a theme. Put simply, action research is "learning by doing"- a group of people identify a problem, do something to resolve it, see how successful their effort were, and if not satisfied, try again. While this is the essence of the approach, there are other key attributes of action research that differentiate it from common problem-solving activities that we all engage in every day. In this context, action research is defined as;

> *'An intervention in personal practice to encourage improvement for one self and others'* (McNiff, Whitehead & Lomax, 2003:19).

As observed by Kemmis and Mc Taggart (1990), the action research program, which involves teachers and students, attempts to organize the conditions under which we can learn from our own experience, and make this experience accessible to others. Even the main focus is on the researcher himself or herself, the attitudes, beliefs and opinions of other people in the context need to be taken into consideration. This gives action research a collaborative dimension by involving people in the context as active co-researchers rather than mere study subjects to be used (Bassey, 1998).

The aim of action research is to address an actual problem in a specific education context namely; the teacher researchers are studying a practical issue that will benefit education (Valsa, 2005). Moreover, teachers engage in action research because it helps them find solutions related to their own situation rather than someone else's practice. Hence, they get involved in a participatory or self-reflective teaching, namely, they reflect on what they have learnt and what they can do to improve their educational situation (Cochran-Smith & Lytle, 1990). Since the teachers in questions had already realized what their problems were, furthermore they were willing towards improving themselves professionally in order to apply and test the proposed solutions collectively agreed upon, this view also partially applies to this research. (Boog, 1996)

4.3.1 Uses of Action Research

The purpose of action research is to seek personal or professional development through action. It involves participation which led Kemmis and McTaggart (2000) to describe it as Participatory research. Action research can be used in any context, besides the educational setting, when "*specific knowledge is required for a specific problem in a specific situation, or when a new approach is to be grafted on to an existing system*" (Cohen and Manion 1994:94). These settings may be administration or management in a school, or it may be in any unrelated area, such as Medicine or the social services. The principles and process of action research stay the same while the context of professional inquiry might change, irrespective of the nature of the practice (Whitehead, 1985).

In education, action research has proven popular because of its practical, most importantly, because it is directed towards improvement of practice within a measured period of time and within a local environment. There are many uses of action research (Ferrance, 2000). It is used in curriculum development, as a strategy for professional development as part of pre-service and in service programs, and in system planning for schools and districts. Action research is considered a viable and useful tool due to the active participation of teachers and others (Valsa, 2005).

4.3.2 Problems of Action research

Some limitations of action research indicated include: lack of time, lack of rigor and validity of research and results are not generalizable (Valsa, 2005). Action research requires researchers to work hurly of their own practice. Monitoring actions closely while in practice as and it demands space and time which the practice doesn't give easily. It is therefore difficult to maintain thoroughness in data gathering and analysis. However, this problem can be resolved by using a variety of research methods used in the traditional research, the action researcher then can carry out the work keeping to strict standards. Triangulation and sharing data with critical friends would guarantee that the quality of what is gathered data is strong and without bias (Fraenkel & Wallen, 2003).

With regard to generalizability, it is argued that the action researcher doesn't intend to seek generalizable data, but to generate knowledge based on action within one's own situation. Any findings from the research are generalizable only within the situation and within the context of the work (Ferrance, 2000). As in this research, the action research was conducted in a school to find a solution to a particular but popular problem that is shared with other schools teaching the same curriculum, with students of the same age group who almost come from the same background, that its data can be valid and representative of other schools and that its solution to the problem or its outcome (Valsa, 2005). This is particularly true within the UAE context with similar students and schools structures throughout.

4.3.3 Action research process

Action research involves a cycle of planning, action, observing and reflection (Zuber-Skerrit, 1992). Normally, monitoring and observing will proceed planning to implement a change. As the researchers become more involved with the research they may find it hard to separate one element of the process from the other. However, as shown in figure (8), once that first change is implemented the action research cycle proceeds generally in a spiral manner (Valsa, 2005)

This basic structure has been explained in different representation of the same process, see for example, Elliott (1981), Kemmis and McTaggart (1982), Ebbut (1985), McKernan (1991) each have promoted the same cyclical approach to action and reflection. This researcher has adapted Zuber-Skerritt's (1996b) model action research for organizational change-with a few changes to fit the planned course of action in this research. Four basic components materialize while carrying out action research: empowerment of participants, collaboration through participation, acquisition of knowledge and achieving change. Though such components interlace during the process of action research, certain phases clearly take place in logical sequence as Zuber-Skerritt's.

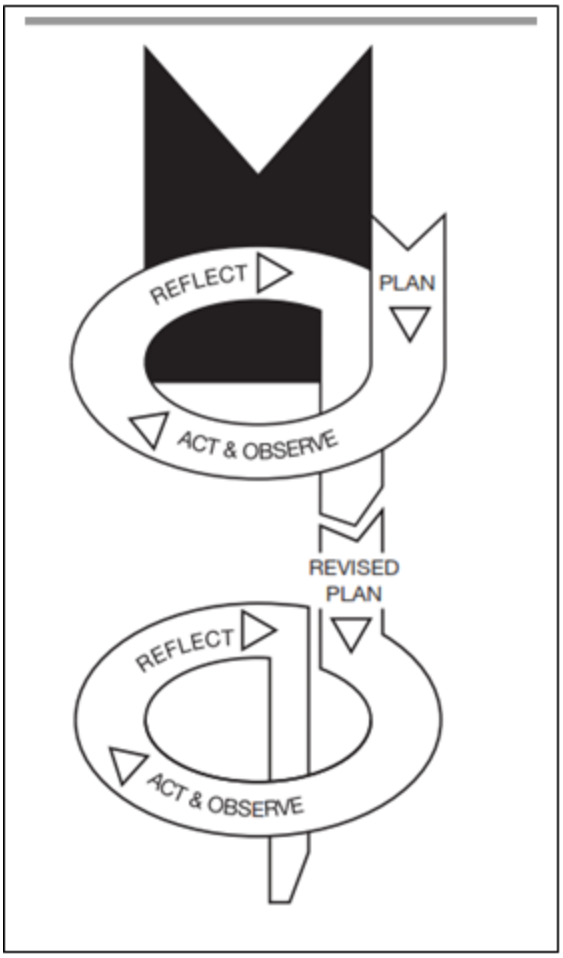


Figure 8. Kemmis and McTaggart action research spiral.(Zuber-Skerrit, 1992)

The process that the researcher goes through to achieve understanding is a spiral of action research cycles consisting of four major phases: planning, acting, observing and reflecting (Zuber-Skerrit, 1992). Each cycle of these four leads to a second cycle where the researcher reflects of the previous cycle to inform the plan of the next cycle (Figure 8). This process of alternating between the cycles provides critical reflection which leads to a greater understanding through the continuous refining of methods, data and interpretation (Dick, 2002).

4.3.3.1 Planning:

Planning in an action research is constructive and arises during discussion by the participants (Kemmis and McTaggart, 1990). The plan must cover critically examined actions by each of the participants and includes the methods of evaluating the changes implemented to solve the problem situation. The problems should be within the teacher's influence as well as interest and doable in the confines of their daily work (Ferrance, 2000). The outcome should complement the schools established programme in order to receive the administrative support and blessing. Once there is an agreement on the shared vision between all concerned bodies, they feel empowered to participate and define the way ahead. Part of the planning phase also includes gathering and investigating relevant data in order to decide what actions needs to be taken (Albirini, 2004). Such data can be collected by using questionnaire, field notes, focus group discussion, checklist, journals and meeting minutes, where most of which were used in this research.

4.3.3.2 Acting:

Action is seen when the plan is put into practice and expectations regarding improvement to the situation occur. This action will be deliberate and strategic (Grundy, 1983). It should be noted that any agreed set of actions should be implemented one at a time, so that it is easy to determine which action was responsible for which outcome.

4.3.3.3 Observing:

Observation of action research is the portion of action research where the changes outlined in the plan are observed to determine their effects on the contexts of the situation (Kemmis and McTaggart, 1990). In this phase the data gathering instruments such as questionnaires and observation methods can be utilized to ensure that proper scientific methods and triangulation of data were used and are implemented to provide meaningful results. Observation and action may occur simultaneously (Albirni, 2004).

4.3.3.4 Reflecting:

The reflection phase includes participants to examine and construct, then evaluate and reconstruct their concern (Grundy, 1983). Reflection includes the preventive discussion of participants have a shared concern, problem or result and the outcomes of the situations implemented. This implies that whatever has been the outcome, be it newly teacher acquired skill or newly developed tools to enhance student learning, was or wasn't a catalyst for success (Whitelaw et al., 2003).

In summary, the participants of action research identify a thematic concern through discussion and reflection and these concerns are integrated into a common goal. So, the participants are empowered to plan and act to bring about a change in the working environment. The changes in practice are effected and observed using an appropriate research validating and evaluating tool. The group critically evaluates the results and with this knowledge theory and solutions may be developed and implemented (Whitelaw et al., 2003).

4.4 The trainer Institute

The MoE IT department has chosen SIVECO Romania as a partner in developing the project for supporting the teaching and learning process in public schools by the use of digital learning materials. The educational solution offered by SIVECO Romania is designed as an additional tool for teachers and students, based on a methodology that specifically targets the advantages of information technology in education and maps computer usage to class room practice

SIVECO's solutions for improving the education in UAE include offering students and teachers' access to the most exciting collection of animations, movies, simulations, exercise and experiments based on mathematics, physics, Geography chemistry and Biology. Furthermore, provided training for teachers in information technology and e-learning software usage, for enhancing the quality of the teaching and learning process (SIVECO, 2009)

4.5 Research Variables

This study has three objectives, first to examine the attitudes of high school teachers in Sharjah towards ICT in UAE education, explore the relationship between teachers' attitude towards ICT and determinants of teachers' attitude and the effect of training upon ICT uptake. These determinants include perceived computer attributes, cultural perceptions, computer competence, computer access, and teacher behavior. The attitudes of UAE teachers toward IT in the UAE education system was the dependent variable in the study. The independent variables were: (a) Perceived computer attributes, (b) cultural perceptions, (c) computer competence (d) computer access, and (e) teacher characteristics (including gender, age, income, teaching experience, school location, education, teaching method and computer training background).

4.5.1 Study Participants (The School)

The research was carried out in a MAG high school for girls (N) in the Emirate of Sharjah. Madares Al Ghad is part to the department of specialized schools in the ministry of Education. Officially, there are three types of government school in the UAE; regular public schools, model schools and MAG schools. The majority of students in (N) are UAE nationals because expatriates are accepted in all three types of schools under certain conditions. Moreover, these schools are free for UAE nationals however; expatriates have to pay minimal fees. Furthermore, the model schools charge fees from all students. MAG schools are equipped with IT infrastructure and the classrooms, laboratories and library are fitted with a data show projector. The population of this school, which is located in a suburban area, is quite high compared to its peers; it has a total of 630 students and 70 teachers.

4.5.2 The Teachers

The school principal agreed that three subject teachers from the Physics, Chemistry and Geography departments were allowed to participate in the study. The teachers have a bachelor's degree in their subject areas and only two of them have the ICDL (International Computer Driving License). The Physics teacher did not think it was important. All the teachers have a full load of 18 hours of teaching per week in addition to their administrative duties. It is worth noting that two of the teachers are UAE nationals whereas the third one is Egyptian.

The researcher administered the questionnaire before the training took place both in school and outside. Their perception of ICT was generally positive. However, there were obstacles that they mentioned. The teachers were not satisfied with the content of the textbooks and the fact that they cannot use it flexibly due to pressures from inspections. They wished to have the liberty to supplement the curriculum as they see fit. Moreover, the Chemistry and Physics teachers expressed their desire to enrich their subject area with something that gives it more life, like ICT, because of the nature of these subjects. The school was equipped with all the necessary tools but teachers were apprehensive about using them. They did not feel comfortable using ICT due to their level of competence and the nature of the subject area.

SEVICO, (2009) provided the training to use software full of readymade materials and illustrations for three months. However, the teachers from (N) school and another school needed to form a committee that would be responsible for translating the materials from English to Arabic according to their specialty. Furthermore, another committee was then formed to edit this translation to be sold to other Arabic speaking bodies. The training was limited to providing the software and how to use it but was not extended to actual IT skills that the teachers lack.

4.5.3 Instrumentation

The quantitative instruments (questionnaire) [C] were fully adopted from Abdulkafi Albirni thesis (2004) at Ohio state university with permission [E]. The qualitative instrument (Journal) in this study was developed by the researcher [D] to obtain additional information that may not be obtained from the quantitative data of the study.

4.5.3.1 Questionnaire:

As mentioned above, the questionnaire was fully adopted from a previous study by Albirini with permission. Copy of the permission is attached [E]. This quantitative instrument was a means of collecting self-reported data from the study participants. The questionnaire consists of six scales that correspond to the main variables of the study [C]: Attitude towards ICT, perceived computer attributes, cultural perception, perceived computer competence, Perceived computer access and teacher characteristics

Part I. Attitude toward ICT scale

The attitude toward ICT (ATICT) scale comprised twenty attitude-related statements. The ATICT consisted of three subscales: (a) Affective (item 1-6), (b) Cognitive (7-15), and (c) behavioral (items 16-20). These three components in this study referred respectively, (a) a teacher's emotional response or liking to ICT in education, (b) his/her factual knowledge about ICT, and his/her overt behavior directed toward it (Zimbardo et al., 1977 cited in Albirini, 2004).

The attitude toward technology was quantified by the score of the 20 items using a 5-point scale, ranging from strongly disagree (1), through disagree (2), neutral (3), and agree (4) to strongly agree (5).The range of possible mean scores was between 1 and 5, with higher scores indicating more positive attitudes. Therefore the responses were converted to a mean score that demonstrated how positive/negative each respondent's attitude toward IT was.

Part II. Computer Attributes Scale

Among the five innovation attributes identified by Rogers (1995), only four computer attributes, namely, relative advantage, compatibility, complexity and observability were examined in this study. The fifth computer attribute, trialability, was not examined because the majority of teachers in the study might have had no chance experiment with computers before they were introduced into schools.

The computer Attribute scale consisted of eighteen statements. The items were grouped into four subscales corresponding to the four innovation attributes. Thus items 21-25 measured computers' advantage, item 26-30 measured computer compatibility, item 30-34 measured computer complexity, and items 35-38 measured computer observability. Higher scores on the complexity subscale indicated positive perceptions about the simplicity of computers (or negative perceptions of the complexity of computers) and not the opposite. The scaling and the rating of the overall computer Attributes scale was the same as that of the ATICT Scale, with higher indicating more positive perceptions of computer attributes.

Part III. Cultural Perceptions

The cultural perceptions scale consisted of sixteen statements. The statement took into account the teachers' perceptions of the cultural value, relevance, and impact f ICT as it relates to both UAE educational and national cultures. The scaling and rating of this scale were the same as that of the ATICT and computer attributes scale, with higher scores indicating more positive cultural perceptions.

Part IV. Computer competence scale

The computer competence scale consisted of fifteen items. The items focused on the common computer uses in education: Software installation (item 1), basic hardware (2-3), productivity software (e.g., word processing) (4-7), telecommunication resources(8-9), basic trouble shooting (10), graphic application (11), grade keeping (12), educational software evaluation (13), organizational tools (e.g., use of folders) (14), and virus handling (15). Computer competencies were quantified by the score of the 15 items n four pint scale, ranging from no competence (1), through little competence (2), moderate competence (3), to much competence (4). The responses were reduced to a mean score that demonstrated how high/low each respondent's perceived computer competence was.

Part V: Computer Access scale

The computer access scale consisted of three statements. These are about computer access taken into account possible locations where computers might be available for use by subject teachers: at home, in school, and other places (the last choice is given to accommodate locations not mentioned in the first two guided responses). Computer access, as an independent variable, was quantified by the score of the three access-related items on a 5-point scale, ranging from never (1), through once a month (2), once a week, (3) 2 or 3 times a week (4), to daily (5). The responses were reduced to a mean score with higher scores indicating greater computer access.

Part VI. Teacher characteristics

The high school teachers were characterized in terms of gender, age, income, teaching experience, school location, education and teaching methods as well as computer training background. Demographic variables were correlated with attitudes to ensure maximum control of extraneous variables and environmental variables by building them into the design of the study. According to Gay and Airasian (2000) participant and environmental variables are the types of extraneous variables that need of control. Participant variables are the characteristics of the participants (such as gender) that cannot be altered but that can be controlled.

Although demographic variables in general do not seem to have consistent relationship with attitudes, a set of these variables were selected mainly based on their theoretical relevance to attitudes (Rogers, 1995). These selected variables were quantified by individual scores on eight items. The responses t all eight items were treated separately as descriptive information that was correlated with the attitudes towards ICT.

Gender: was measured by asking respondents "what is your gender?" with a dichotomized choice of male or female as guided response.

Age: was measured by asking respondents "what is your age" with a choice of ten year interval as guided responses.

Income: was measured by asking respondents "what is your monthly average household income in UAE AED", with a choice of 5-thousand AED interval as guided response.

Teaching experience: was measured by asking respondents" Including the current year, how many years have you been teaching?" with a choice of 5-year interval as guided responses.

School location: was measured by asking respondents, "in what type of school do you teach?" with a choice of urban, suburban and rural as guided responses.

Education: was measured by asking respondents, what was the highest completed academic degree? With a choice of Teacher certificate, Bachelor's and Master's as guided responses.

Training experience: was measured by asking respondents" have you ever attended any training courses, workshop, seminar on using computers?" with a choice of "yes" or "No". For respondents answering with "yes" a further question asked them to specify the number of hours and/or days with no guided responses.

Teaching method: was measured by asking respondents, "What is the teaching method you used most often?" with a choice of active discussion, collaborative activities, demonstration, hands-on learning, lecturing, role playing, computer assisted instruction and others as guided responses.

4.5.3.2 Journal

An open ended question form was developed by the researcher in order to obtain more details related to the survey of data collected after each class [D]. The Journals were intended to further probe some issue to complement the questionnaire data. Specifically, the journals were expected to provide some explanations for the positive attitudes of the study participants, their cultural perceptions, and their lack of computer competence, access, and training. Each journal consisted of seven open ended questions including: what is the type of lesson today? Was ICT used in this study? How and why? Have you mentioned ICT used in the lesson plan? Why / why not? Before each lesson did the teacher surf the internet and choose appropriate material? And other related questions.

4.6 Data Collection

The data were collected in two stages. In stage one; the questionnaire was administered to the three study subject teachers before the training. A cover letter [F], a letter of informed consent [G], and a return envelope accompanied the questionnaire. Three questionnaires were distributed and delivered in person to the study participants.

In stage two, the same questionnaire was given to the subject teachers after the training. Moreover, the journals were provided for each teacher with open ended questions to collect data that could not be collected by the questionnaire.

4.7 Data Analysis procedures

Descriptive statistics were employed for analyzing quantitative data of this study. This was to describe and summarize the characteristics of the study population. Excel was used to summarize the quantitative data. Qualitative data were analyzed after transcribing the information into their most relative category using qualitative approach (Glesne, 1999). *'Within this paradigm, 'it is possible to understand the subjective meaning of action (grasping the actor's beliefs, desires and so on) yet to do so in an objective manner'* (Schwandt, 2000, p .193).

The journals were transcribed verbatim and then coded. The coding was done using Glesne (1999) recommendation for data cataloging which starts by using analytic codes, categorize information, and find a unified theme. The first step was to analytically read and group the participants' transcribed responses according to the research questions. Then identifying any recurrent words, phrases, and ways of thinking within each group and labeling them into coding categories; this was done after the basic grouping of data. Related codes were synthesized into broader codes and this coding of data was done manually. Relevant quotation were grouped with their related codes and then translated into English. Pseudonyms were used to identify individual respondents to ensure the anonymity of the respondents. Finally, the relationship between the codes were sought and gathered into themes and sub-themes. The results of the qualitative data were reported separately [5.4].

4.8 Ethical consideration

Before conducting the research, approvals were sought and written consent of the study participants was obtained to collect the data. To maintain confidentiality of the study participants and the school, their names were changed. The teacher's participation was voluntary and they had the right to withdraw at any stage of the research without any negative consequence. I assured their anonymity and confidentiality of information and all the writings by the participants were kept securely [G].

Chapter Five

DATA ANALYSIS AND RESULTS

This chapter starts with a brief summary of teachers characteristics followed by descriptive statistics of the teachers' attitude toward ICT. Finally, in the third section description of teachers' perception of (a) computer attributes, (b) cultural relevance of computers, (c) their own computer competence, and (d) their computer access. The last section summarizes the themes, patterns, and relationships that emerged from the qualitative data. From different sources of validation, collected data was triangulated. A combination of two questionnaires and a weekly journal helped to substantiate and strengthen data interpretation. To increase the validity of qualitative data use of triangulation in action research has been observed as a necessity (Campbell, 1993, Smith, 1975 as cited in Cohen et al. 2000).

5.1 Teachers Characteristics

Characteristic of the teachers are presented in terms of (1) demographic information including sex, age, income, teaching experience, school location, and education and preferred teaching method, and (2) background information regarding computer training (Table 3).

All the respondents (100%, n=3) were female. All of them were in different age groups with an age range of 20-49. Two-third of the respondents' monthly income was in the range of 15-19 thousand AED per month, with one study participants who failed to respond to this item. All of them held a Bachelor degree; however, their teaching experience was very wide and ranged from 1 to 5 years up to 21 years or more. The school locations for all study participants (100%, n=3) were in suburban areas.

Variable	Category	Frequency
Gender	Male	0 (0)
	Female	3 (100)
Age	20-29	1 (33.3)
	30-39	1 (33.3)
	40-49	1 (33.3)
	50-59	
Income	5,000 - 9,000	
	10,000 - 14,000	
	15,000 - 19,000	2 (66.7)
	20,000 – 24,000	
	≥25,000	
	No response	1 (33.3)
Teaching experience	1-5 years	1 (33.3)
	6-10 years	
	11-15 years	1 (33.3)
	16-20 years	
	≥21 years	1 (33.3)
School location	Urban	3 (100)
	Sub-urban	
	Rural	
Education	Teacher Certificate	
	Bachelor's	3 (100%)
	Master's	
Training	No	
	Yes 1-20 days	1 (33.3)
	21-40 days	2 (66.7)
	41-60 days	
	≥ 61 days	
Teaching Method	Active Discussion	2 (66.7)
	Collaborative activity	3 (100)
	Demonstration	1 (33.3)
	Hands-on	1 (33.3)
	Lecturing	1 (33.3)
	Role playing	1 (33.3)
	Computer assisted	3 (100)

Table 3: Summary of teachers' characteristics

Two of the study participants (66.7%) had training in the range of 21-40 days. The remaining was in the range of 1 to 20 days. All respondents (100%, n=3) used collaborative activity and computer assisted teaching methods followed by active discussion (66.7%). However, the Geography teacher used all the listed teaching methods (See table 3).

5.2 Teachers' attitude toward ICT in Education

Participants were asked to respond to the 20 statements dealing with their attitudes toward ICT in education. Table 4 describes the frequency of participants' responses to the 20-item Attitude scale. The first six items were designed to measure the affective domain of computer attitude. The next nine items were designated to measure the cognitive domain and the remaining five items were designated to measure the behavioral domain. Computers attitudes of the three subject teachers were represented by a mean score on a 5-point scale, where 5 (strongly agree) represents the maximum score of the scale and 1 (strongly disagree) represents the minimum scale. Lower scores indicate less positive attitudes and higher scores indicate more positive attitudes.

	Percent (%)				
Computer Attitude scale	**SA**	**A**	**N**	**D**	**SD**
1.Computer don't scare me at all	66.7	33.3			
2.Computer make me feel uncomfortable		33.3		33.7	33.7
3.I am glad there are more computers these days	66.7	33.3			
4.I don't like taking with others about computers			66.7		33.3
5.Using Computers is enjoyable	33.7	66.7			
6.I dislike using computers for teaching				33.3	66.7
7.Computers save time and effort	66.7	33.3			
8.Schools would be a better place without computers				33.3	66.7
9.Students must use computers in all subject matters	33.3	33.3	33.3		
10.Learning about computers is a waste of time				66.7	33.3
11.Computers would motivate students to do more study information study information	33.3			33.3	
12.Computers are fast and efficient means of getting	100				
13.I would never need a computer in my classroom				66.7	33.3
14.Computers can enhance students' learning	33.3	33.3	33.3		
15.Computers do more harm than good				33.3	66.7
16.I would rather things by hands than with computer			33.3	33.3	33.3
17.If I had the money, I would buy a computer	66.7	33.3			
18.I would avoid computers as much as possible				66.7	33.3
19.I would like to learn more about computers	66.7	33.3			
20.I have no intention to computers in the near future				33.3	66.7

Table 4: Frequency percentage on the attitude scale

The mean score of affective domain before the training was 3.3 which are between neutral and positive indicating inclination towards a positive effect towards ICT. All teachers disagree or strongly disagree to the negatively stated items 2 and 6. But, the majority of them (66.7%) of them were neutral for negatively stated item 4. This indicated that the majority of them were comfortable (66.7%) about computers, liked using them in teaching (100%), they were glad more computer as are available these days (100%).

With regard to cognitive domain the mean score was 3.9 indicating positive cognition of ICT (Table 4). Like the affective domain, the cognitive domain also increased to 4.7 after the training. All of them agree or strongly agree that computers are fast and efficient means of getting information and computers save time. Unlike other items, for the statement about students must use computers in all subjects, none of the respondents had similar opinions, their idea range from neutral to strongly agree. All of them strongly agree or agree that computers do more good than harm.

The mean score of the behavioral domain was 4.4 demonstrating positive behavioral intentions toward ICT. The behavioral and the affective domain had the highest (4.8) mean score after training. All of the respondents intended to buy computers and will use computers. All of them disagree or strongly disagree with the negatively stated items except item 16, where one respondent replied as neutral.

The overall mean score (4.76) after the training is higher in all domain as shown in figure (9). When each teacher was observed separately, the chemistry teacher had no difference before and after training in four items namely, item 1, 9, 12 and 21. All of the remaining items improved after the training. On the contrary, the Geography teacher showed no change before and after the training. After reversing the negatively stated terms into positive, the mean score was 5, which the maximum mean score that can be obtained. Consequently, no improvement from this maximum point was expected, already saturated towards a positive attitude about ICT. The Physics teacher was some way between Geography and Chemistry, no difference was reported in 10 items and improvement recorded in the remaining items.

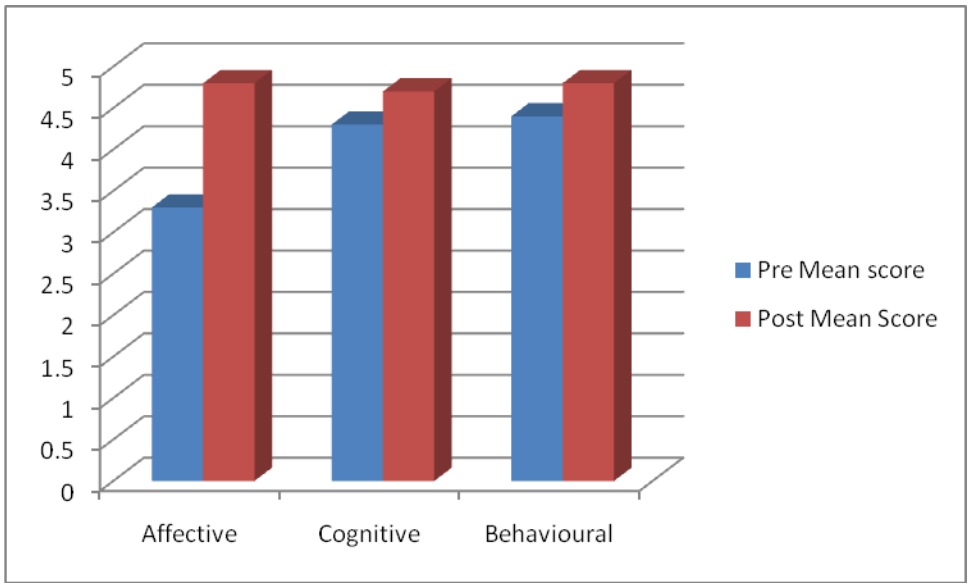


Figure 9. Attitude Mean score distribution before and after the training

5.3 Teachers' perceptions in terms of factors related to Attitudes towards ICT

In this section, a description of teachers on four main independent variables will be presented: (a) Perceived compute attributes (b) Cultural perceptions (c) perceived computer competence and (d) perceived level of access.

5.3.1 Computer Attributes

Participants were asked to respond to the 18 statements dealing with their perceptions about computer attributes. Table (5) illustrates the frequency of participants' responses to the 18-item computer Attribute scale. The items were designed to measure teacher's perception of the relative advantage of computers (item 1-5), their compatibility with teachers' current practices (6-10), their complexity (items 11-14), and their observability (15-18).

Computer Attributes Scale	SD	D	N	A	SA
1.Computers will improve education			33.3	33.3	33.3
2.Teaching with computers offers real Advantage over				66.7	33.3
3.Computer technology can not improve the Qual. of stud learning	33.3	33.3		33.3	
4.Comp make sub matter more interesting			33.3	33.3	33.3
5.Computers are not useful for language learning	33.3	66.7			
6.Computers have no place in schools	66.7				
7.Computer use fits well into my curriculum goals			66.7		33.3
8.Class time is too limited for computer use	33.3	33.3		33.3	
9.Computer suits my student learning				66.7	33.3
10.Computer use is appropriate for many language activity				66.7	33.3
11.Hard for me to learn to use the comp teaching	33.3	66.7			
12.No difficulty in understanding the basic function of comp				66.7	33.3
13.Compueter complicate my task in the class room	66.7	33.3			
14.Everyone can easily learn to operate a computer				33.3	33.3
15.I have never seen computers at work	66.7			33.3	
16.Comp proved effective learning method worldwide				66.7	33.3
17.I have never seen comp being used as educational tool	100				
18.I have never seen some UAE teacher use comp for edu purpose				33.3	66.7

Table 5: Percentage distribution of computer attributes scale

Respondents were midway between neutral and positive perceptions of the relative advantage of computers, with a mean score of 3.3. All respondents (100%) agree or strongly agree that teaching with computers offer real advantages over traditional methods of instruction. Furthermore, two of respondents (66.7%) agree or strongly agree that computers will improve education and computers will make subject matter more interesting. Two (66.7%) of the respondents agree or strongly agree that computer technology can improve the quality of student learning and computers are useful for language. However, there was a respondent who considered that computer technology cannot improve the quality of education.

Similarly, the teachers' perceptions of the compatibility of computers with their practice were midway between neutral and positive with a mean score of 3.6. All respondents (100%) agree or strongly agree that computers suit my student learning and computer use is appropriate for many language activities. However, two (66.7%) of the respondents were neutral about the computer use in fitting well into their curriculum goals.

The teachers perceptions of the simplicity of computers were also mid way between the neutral and positives with a mean score of 3.4. All respondents (100%) agree or strongly agree that computer do not complicate the class task. Moreover, it is not hard for them to learn and use computers in teaching, and there is also no difficulty in understandings the basic functions of computers. Two (66.7%) of the respondents also agreed that everyone can easily learn to operate a computer.

As to their observability, the mean score is similar (3.4) like that of computer simplicity all respondents (100%) agreed or strongly agreed that the computer proved to be an effective learning method worldwide and it is common to see computers being used as an educational tool but none of the respondents observed UAE teacher utilization of computer for education purposes. In general, teachers' perceptions of computer were somewhat positive with an overall mean score of 3.4 (Figure 10).

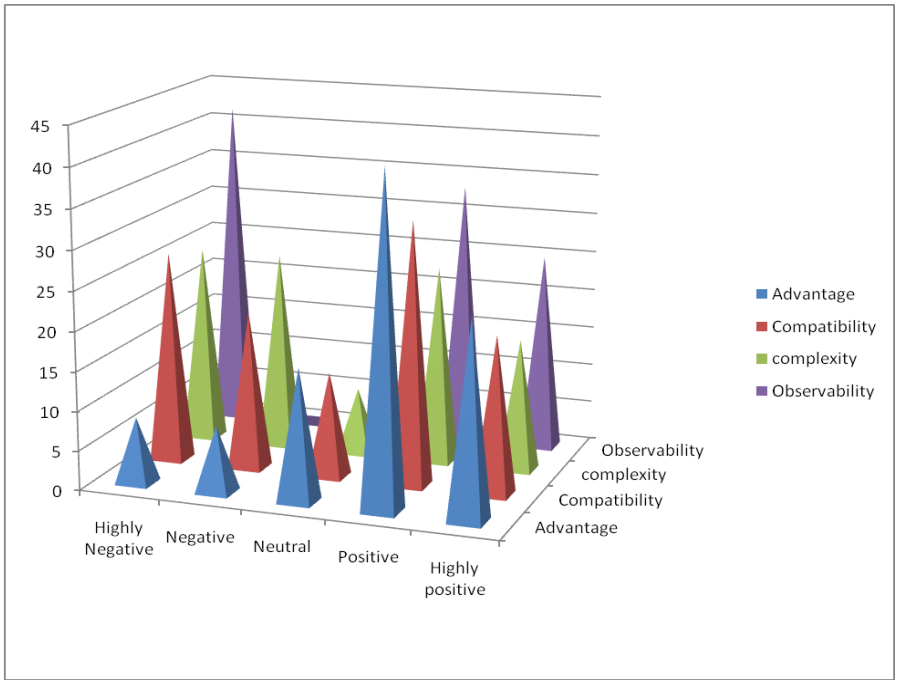


Figure 10: Percent Distribution of mean score on Computer Attributable scale

The overall mean score of computer attributable before and after training was similar 3.4. Moreover, the observed change after the training with regard to relative advantage, observability, complexity and compatibility is not as such significant as shown in the figure (11) below.

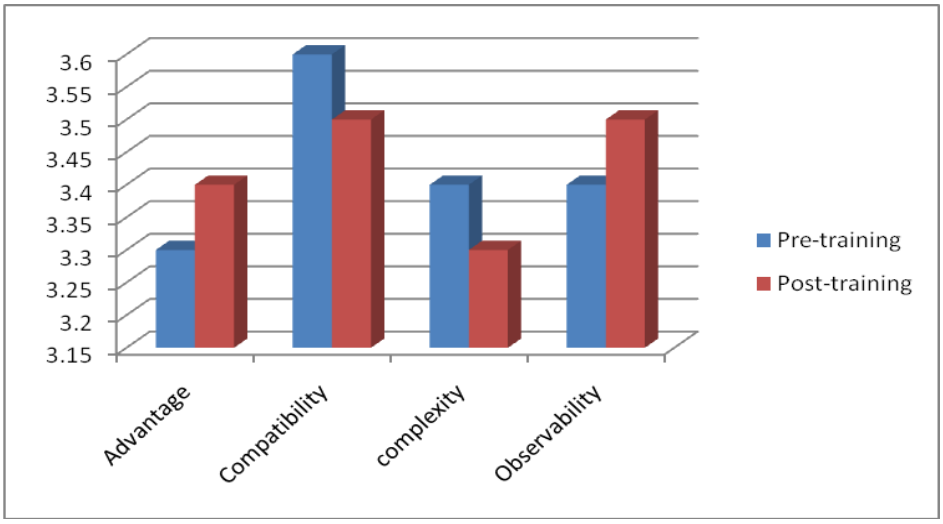


Figure. (11) Mean score distribution of computer attributable scale before and after the training.

5.3.2 Cultural Perceptions

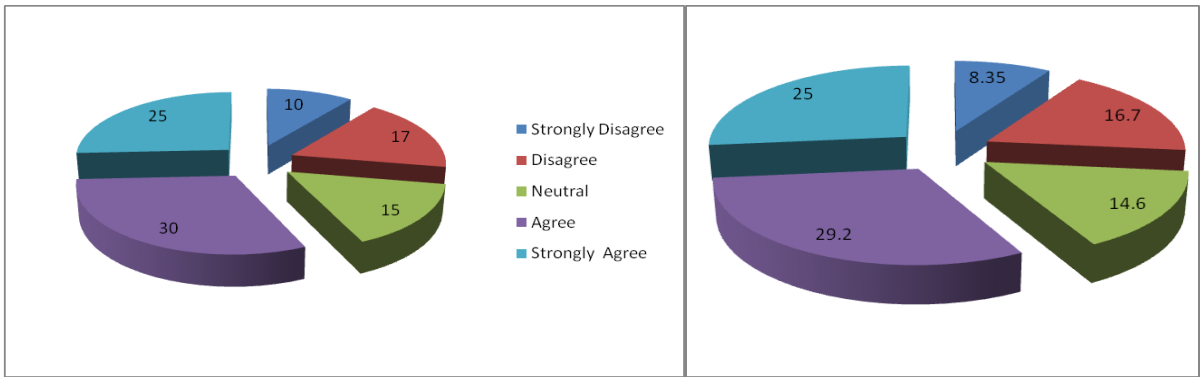
Participants responded to the 16 statements dealing with their perception about computers' cultural relevance and impact on UAE society and schools. The overall mean score on the cultural perceptions scale was 3.49 which indicated that the teachers' perceptions of the cultural relevance of computers were somehow between neutral and positive.

All respondents (100%) strongly agreed that students need to know how to use computers for future jobs. All respondents (100%) also agreed or strongly agreed that knowing about computers earn the respect of others, computers will improve our standard of life, using computer would not hinder from learning their tradition, computers proliferate too fast, and the increased proliferation makes our life easier and working with computers does not diminish our relationship with others (see table 6).

Cultural Perceptions Scale	SD	D	N	A	SA
1. Comp will not make any difference in class room…	33.3	66.7			
2.Stud need to know how to use computers for future jobs					100
3.students prefer learning from teachers than comp.	33.3	33.3	33.3		
4.Knowing about comp earn the respect of others				66.7	33.3
5.we need computer that suits the Arabic culture and identity				33.3	33.3
6.Computers will improve our standard of living				66.7	33.3
7.Using computer would not hinder form learn their tradition				66.7	33.3
8.Computers are proliferating too fast				33.3	66.7
9.People who are skilled in comp have privilege not available			33.3	33.3	33..3
10.Comp will increase your dependence on foreign Countries	33.3	33.3	33.3		
11.There are other social issues before implementing comp in edu			66.7	33.3	
12.The increased proliferation make our life easier				66.7	33.3
13.Computers dehumanize society.	33.3	66.7			
14.Working with computer doesn't diminish our r/ship with others				66.7	33.3
15.Computers encourage unethical practices			66.7	5	33.3
16.Computers should be a priority in education	33.3	66.7			

Table 6: shows the frequency of participants' responses to the cultural perception scale.

On the other hand, all respondents (100%) disagree or strongly disagree that computers should be a priority in education, computers will not make any difference in the class room and computer dehumanized society. Moreover, two (66.7%) of the respondents disagree or strongly disagree that computers will increase dependence on foreign countries (see figure 12).



A **B**

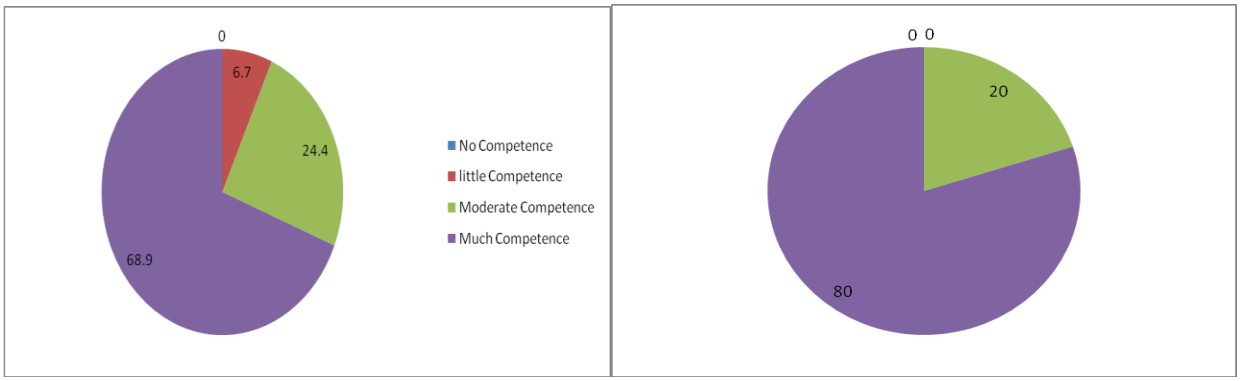
Figure 12: Percent distribution of computer perceptions (A) Pre-training, and (B) Post-training

With regard to cultural perception, the percent distribution after the training has no significant change as shown in figure (12). Moreover, the overall mean score before and after the training was 3.49 and 3.48, respectively. The culture perception of UAE teachers was between neutral and positive, and this was not improved even after the training.

5.3.3 Computer competence

Participants were asked to respond to their perception about their level of computer competence which consists of fifteen statements. Figure (13) shows the frequency of teachers' responses to the 15-item computer competence scale. Computer competence to subject teachers was represented by mean score on a 4-point scale ranging from 1 (No competence) to (Much competence).

As figure (13), clearly indicates that the teachers have competence in the majority requested items followed by little competence. Little competence was reported only in two of the fifteen items. No competences were reported for any of the items. After the training, much competence increased from 69% to 80%, little competence decreased from 24.4% to 20% and little competence completely removed after the training. This indicated that the training had brought significant change in the competence of the teachers.



A B

Figure 13: .Distribution of percent computer competence scale (A) Before the training and (B) After the training

The participants reported that they had much competence in using computers. The overall mean score of teachers' responses on the computer competence scale was 3.65 (figure 14). All respondents (100%) had moderate or much competence in handling all computer functions except operating graphic problems and selecting and evaluating educational software. Even in these two activities, the majority (66.7%) of them had moderate or much competence. Only 33.3% of them had little competence operating graphic problems and selecting and evaluating educational software. These were the only items where little competence was reported. The respondents had moderate or higher in the remaining thirteen items dealing with competence.

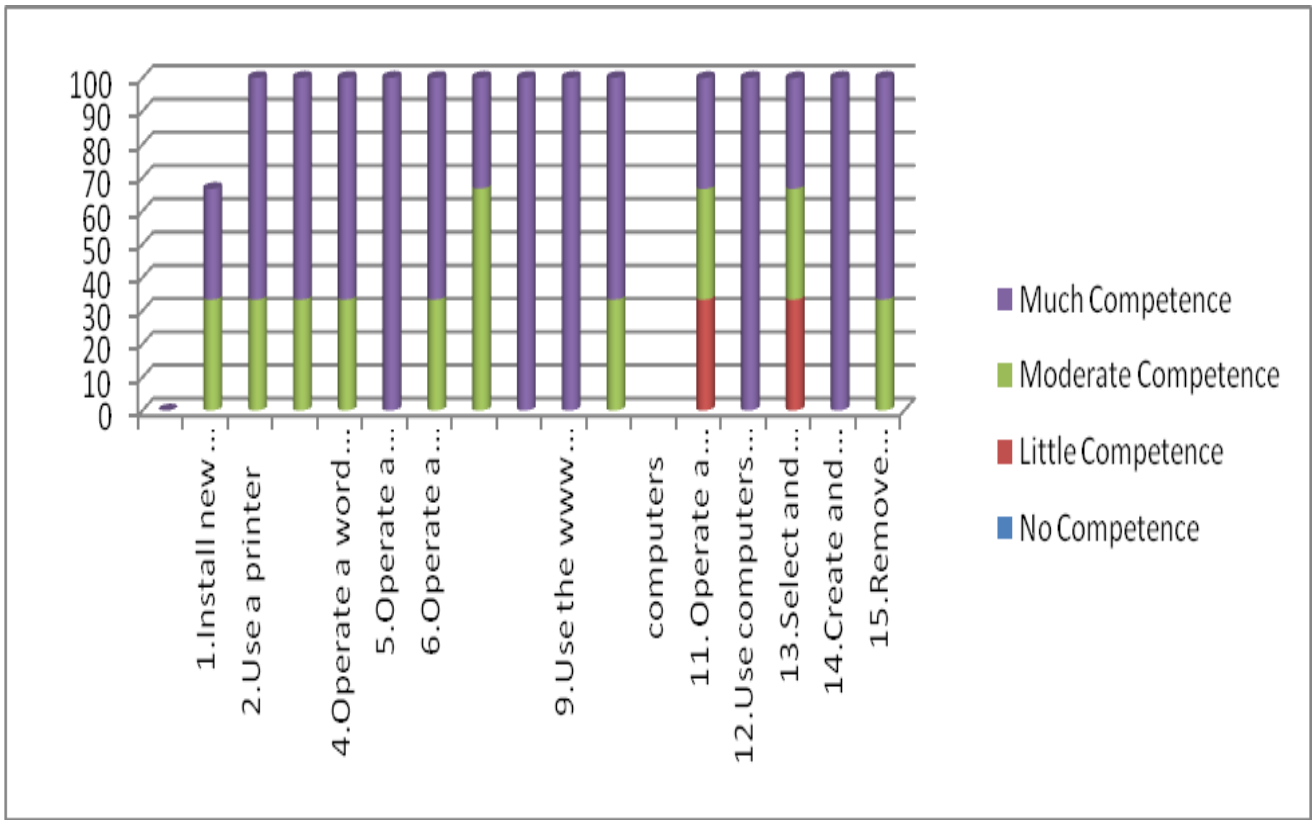


Figure 14: Frequency percentages of Computer competence scale

All respondents (100%) had much competence specifically in operating a presentation program, using the Internet for communication, using the www access different type of information, using computers for grade keeping, and creating and organizing computer file and folders.

5.4 Qualitative Data

The qualitative data is crucial not only to strengthen and support the findings from the quantitative data but also to clarify any ambiguities that emerged after answering the survey including the explanation of the teachers' positive attitude toward ICT, cultural perceptions, low level of computer competence, access, and training. Triangulation in collecting data ensures the quality of the findings and other advantages include: "increasing confidence in research data, creating innovative ways of understanding a phenomenon, revealing unique findings, challenging or integrating theories, and providing a clearer understanding of the problem" (Thurmond, 2001, p. 254 cited in Guion. et al., 2012). The main findings from the qualitative data analysis were described below.

The teachers' positive attitude towards ICT which was indicated in the quantitative data was also supported by the qualitative data. The most frequently mentioned reason stated about positive attitude to ICT by the study participants were "*ICT make it easier to display and increases student attention so that students can easily understand the subject matter*" [H] As mentioned by the Physics teacher ICT, namely internet in this specific case "*has many supporting materials which can be used for demonstration, consequently, students will not learn by imagination but by grasping the reality*" [H]. This idea is also supported by the Chemistry teacher who used internet to show various topics of the chemistry subject including chemical reaction, writing the chemical formula and statistics about garbage.

Teachers' concentrated in their responses on the relative advantages of the computer rather than computer attributes. That is, almost all respondents credited their positive attitude toward the computers to the advantages that they might bring into the field of education. Other computer attributes, such as compatibility, complexity and observability were scarcely mentioned by the participants. They mentioned that computers can be useful in education in the following ways: (a) make easier to display and describe, (b) helps to finish the lesson on time/ to use time effectively (c) add an element of interest and attention, (d) help students to easily grasp the topic (e) an excellent visual aid, and (d) enhances active participation of students.

Chapter six

Discussion

6.1 Overview

Diffusion and adoption of ICT was spread around the world for its presumed crucial role in every side of our societies. The call for ICT infusion in the developing countries brought challenges and potentials (Bingimlas, 2009). Using ICT for national development requires developing the agents' capacities. Therefore, education systems should then start their own initiatives to include ICT. Regrettably, these initiatives have faced problems related to the attitudes of the users due to lack of information gathering and planning that has often been overlooked in the urgency to implement ICT in schools

The UAE is one of the countries that represent the above situation. The UAE MOE has started an initiative to introduce ICT tools into schools as a way of reforming education in MAG schools without considering the attitudes of UAE teachers toward the Ministry's initiative (Makrakis, 2005). The most important motion of this study was to examine teachers' attitude toward ICT. Furthermore, the specific objectives of this study were to determine the attitudes of high school subject teachers in Sharjah, UAE toward ICT in education and to explore the relationship between teachers' attitude and variables that might have shaped them. The variables were mainly identified from the literature on technology implementation in developing countries, were: computer attributes, cultural perceptions, computer competence, compute access, demographic variables (including training background).

Both quantitative and qualitative methods were used in this study to collect data from subject teachers in (N) School, Sharjah, UAE. Using a questionnaire, quantitative data were collected from a purposive sample of Chemistry, physics and Geography teachers. The questionnaire was followed by weekly journals with open ended question which was completed after each class by each and every teacher for seven consecutive classes. This discussion is based on the results from both types of data and the implications that they have in this investigation.

6.2 Attitudes

An important factor for the success of technology integration in education is teachers' attitude toward ICT. This has been generally recognized (Woodrow, 1992, Watson, 1998 cited in Albirini, 2004). Attitudes are thought to be consisting of affective, cognitive and behavioral elements. Affective refers to feeling towards the attitude object; cognitive refers the perception of the attitude object; and behavioral refers to the response to the attitude object (Ajzen, 1988). Attitude requires the complete description of all the three components, namely the affective, cognitive and behavioral, be assessed by measuring of all the response classes (Ajzen and Fishbein, 1980). Attitude toward computers are thought to influence not only the acceptance of computers, but the future behaviors, such as using computers as teaching aid (Becker, 2000; Braak, 2001; Earle, 2002, Kumar & Kumar, 2003)

The results of both questionnaire and journals data indicated that the study participants had positive attitudes towards ICT in education. The study subjects' positive attitudes were obvious within the affective, cognitive and behavioral domain with a mean score of 3.3, 4.3 and 4.4, respectively; all the domains mean score were improved after the training and became in the range of 4.7-4.8. Although before the training the mean score of the domains was lowest in the affective and highest in behavioral domain, after the training all the domain have almost equal mean score as mentioned above.

The overall mean score (4.00) towards attitude of computer of this study is comparable with study done in Jordan (3.97) and Syria (4.04) indicating that teachers found in these country and in the UAE have positive attitudes towards ICT in education. The highest mean score (4.4, before the training) among UAE subject teachers were behavioral subscale, indicating that the teachers' unambiguous behavior towards ICT is positive. That is why all of them agree about learning more about computers and to purchase one if they had money.

It was shown that two (66.7%) of the subject teachers, as for the affective scale, reported like using computers in teaching and comfortable about ICT in general and in education in particular. All of them also agree/strongly agree that they liked using computer in teaching. Moreover, in the journal, participants attributed their positive attitudes to ICT as a teaching aid

but their utilization is limited, just for the simple displaying of an illustration or to describe their topic using power point presentation [H].

With regard to the cognitive subscale, it was discovered that all the subject teachers share the belief that computers save time and money. Despite some of them are neutral with regard to the role of ICT as a tool to be used in all subject matters, all of them agreed that the computer is unique in terms of speed and efficiency in getting information. This reveals a readiness among UAE teachers to use computers in the class room, which is an important finding of this study.

This finding is comparable with a study done in Jordan (Abu Samak, 2009) and Syria (Albirini, 2004) indicating that teachers in UAE, Syria and Jordan have positive attitudes towards ICT. Teachers' positive attitudes demonstrate their initiation into the innovative process (Rogers, 1995).

6.3 Relative advantage, Compatibility, Complexity and Observability

Among the five innovations attributed by Rogers (1995) only four, namely, relative advantage, compatibility, complexity and observability were examined in this study. The perceived computer attribute scale were grouped into four subscales corresponding to the four attributed listed above.

The participants' attitudes toward observability of ICT were positive. This result indicated that when the teachers observe the advantages of an innovation, they are more likely to adopt it. According to Rogers (1995), innovations that are perceived to have observability will be adopted. All of the respondents asserted that computers are proved to be an effective learning tool worldwide.

On one hand, most of the respondents agreed that they have seen computers at work and being used as an educational tool, on the other hand, all of them also agreed that they have never seen some UAE teachers use computers as an educational tool. This indicated that still there are significant numbers of UAE teachers who do not use computers as an educational tool for their own reasons. This study result differs with the Jordanian study that reported Jordanian teachers had seen teachers using computers for educational purposes. The overall mean score before and

after the training are same 3.4. This indicated that some effort is required to improve the observability of ICT in education of UAE.

With regards to subject teachers' perceptions of the relative advantages of ICT had the lowest mean score, 3.3, although all of them agreed or strongly agreed that computers suit my class and it is appropriate for many language activities. All respondents reported that computers are useful in language learning and teaching with computers provides a real advantage over teaching using traditional methods. Furthermore, two (66.7%) of them stated that using computers would make subject matter more interesting. All these demonstrated that the teachers' perception in relation to the relative advantage of ICT significantly higher as compared to other teaching methods.

UAE subject teachers' perception of complexity of ICT was 3.6, in the sense that the computer is not complex for them to learn and to use for their daily application. This was supported by their report with regard to the four statements. All of them agreed that it was not hard for them to learn to use computers, none of them had difficulty in understanding the basic functions of computers and everyone can easily learn to operate a computer. In addition to this, computers will make their task very easy.

Two of the teachers reported that time was too short for using computers in the class room. This idea was also supported by earlier study done in Europe by This is in agreement with earlier study done by Hardy (1998), Murphy (2000), Al-Ammari (2004), Albirini (2004), Bingmilas (2009) and AbuSamak (2009) that suggested one of the reasons teachers do not use ICT significantly in lessons is due to time limitations in their job. In summary, there is no significant difference among observability, relative advantage, complexity and compatibility both before and after the training except a little higher mean score in compatibility. This differs from earlier study done by Abirini (2004) where ordered from highest to lowest mean score the order was: relative advantage, observability, compatibility, and complexity. In study done by Abu Samik (2009) from the highest to the lowest mean scores of perceptions of ICT attributes were obsevability, relative advantage, complexity, compatibility. Such differences of this study

with the earlier can be explained by difference in the period of study which is consequently demonstrated by increased access. These days, one can say that life is difficult without ICT.

Although teachers have positive perception towards ICT, their use in the class room is very limited. This is supported by the quantitative data that indicated presence of little competence in operating graphic problems and selecting and evaluating educational software. Furthermore, a majority of teachers in Europe perceive ICT to offer advantages to class room learning but many also struggle to see specific benefits and methods (Oldfield, 2010).

A number of studies recognized this specific contrasting perception from teachers (Korte and Husing, 2007, Balanskat et al., 2006, Becta, 2008). The Empirical survey found that a fifth of European teachers felt that using computers in class did not have significant learning benefits for pupils' (Korte and Husing, 2007). A survey of UK teachers also showed that teacher's positivity about the possible contributions of ICT was moderate as they became ambivalent and sometimes doubtful about specific, current advantage (Becta, 2008).

Teachers differ on whether they feel ICT makes their jobs easier or adds to their workload. Nearly 50% of teachers participating in the notebook survey agreed that using note books will increase their workload (EU Schoolnet, 2010). Teachers have varying perceptions about their effectiveness when using ICT in the class room, which can subsequently impact on how much they use technologies in the class room. For instance, teachers in the UK reported high levels of self-related effectiveness, but teachers in a Turkish study felt much less confident about the technology skills and therefore usage in the class room (Becta, 2008, Gulbahar and Guven 2008). According to Bingimlas (2009), teachers who agree that ICT is useful for them and expressed their desire to use it further, are the ones who have high levels of confidence. Balanskat et al (2006) found that teachers' practice is not changing much when they use ICT, but it also reported that teachers with highly positive perceptions of ICT impact will use it in a more project oriented, collaborative and experimental way than others.

6.4 Cultural perception

The cultural perception scale consists of statements which considered the teachers' perception of cultural value, relevance and impact of ICT as it related to UAE culture. It was between neutral and positive and did not change even after the training. All subject teachers participated in this study demonstrated their conviction that it is important for students to learn how to use computers, students need to know how to use computers for future jobs and that knowing about computers earned the respect of others.

In addition, the majority of them sense that people skilled in computer had privileges not available to others. All the participants stated that computers should not be a priority in education. None of them agree with regard to computer's contribution in increasing their dependence on foreign countries. As it is expected, the mean score of cultural perception before (3.49) and after (3.48) did not make any significant difference. The cultural perceptions of ICT among UAE teachers are similar to those teachers of Jordan, Syria and other parts of the Arab world (Abusamak, 2006; Albirini, 2004; Kibbi, 1995).

6.5 Competence

The perceived computer competence scale consisted of 15 items on a four-point scale ranging from no competence (1), to little competence (2), to moderate (3), and to much competence (4).Unlike earlier study done Albrini (2004), AbuSamak (2006) study, all study participants in this investigation used internet, create and organize computer file and folders, use computers for grade keeping, use the www access different type of information, use the Internet for communication and operate a presentation program with much competence. This difference may attribute to increased awareness and access in at t this period of study. The mean score of this study 3.7 and 3.8 (before and after the training) was much higher than earlier study done by Abirini (1.78) and Abusamak (2.99) indicating the apparent digital gap among UAE, Syrian and Jordanian teachers.

The finding of the current study in terms of training is consistent with the finding of earlier studies done by David (1994), Yildrium (2000), Granger et al., (2002), and AbuSamak (2006). Professional training was one of the necessities for teachers in US to be able to use technology

effectively (David, 1994). Kluever et. Al (1994) reported that there was a noticeable change in teachers' attitude towards computer use following the professional training. In addition, the results of Yildirium's (2000) study demonstrated that the Turkish teachers' anxiety towards computers decreased significantly after training. Simultaneously, their level of confidence and liking of computer also increased. On the other hand, Tuzcuglu (2000) found that the teachers lack of training and experience resulted in the under use of computers in the class room.

The study done in Malaysia indicated that teachers reported major changes as a result of undertaking of ICT training on their attitudes towards ICT and upon their instructional methods. After undertaking the ICT training, the teacher became more aware of the benefits of ICT. Teachers also reported major changes in their instructional strategies as a result of ICT training. Furthermore, the participant teachers believed that their teaching became more student-centered as a result of ICT training. These findings were also confirmed by principals' accounts. More than ninety percent of principals believed that teachers who had undertaken ICT training become more effective in their teaching as a result of their training (). In addition, the majority of principals believed that ICT teacher training was reflected positively in students' achievements (Mahmud & Ismail, 2010). Similar, success was also reported in a recent study done Jordanian teachers (Abuhamid et. al., 2011)

Chapter Seven

Conclusion and Recommendations

7.1 Conclusion

The UAE subject teachers hold positive attitudes towards ICT in education as indicated by the finding of this study. The journals used in this study provided a deep look into the positivity of the teachers under investigation.

All the teachers participated in the study were females living in urban and held a Bachelor degree. All of them had training in computers but they vary with respect to their age, teaching experience and teaching method used in their class rooms. Collaborative activity and computer assisted teaching methods are the only methods used by subject teachers in common.

Teachers' perceptions of the positive attributes of computers, and more specifically; participants emphasized the relative advantage of computers as a teaching tool at the expense of other computer features: compatibility, complexity, and scalability of observation. However, the use of their own computers and way of teaching is very limited; it is usually only used to display the illustration / figure.

The results of both questionnaire and journals data indicated that the study participants had positive attitudes towards ICT in education with a higher mean score in cognitive and behavioral domain. All the domains mean score were improved and became almost equal after the training. This indicated how training improves attitude and minimized the wide gap that existed earlier among the affective, cognitive and behavioral domain. The affective domain had the least mean score before the training but latter improved and become equivalent with the other domain.

Teachers' cultural perceptions of the relevance of ICT ranged between neutral and positive as it relates to the cultural norms in the UAE. Despite the fact that teachers had positive attitudes towards the cultural aspects of ICT, The qualitative data showed that this was the only variable that did not bring any significant change after the training.

The overall mean score of computer attributable before and after training was similar. Moreover, the observed change after the training with regard to relative advantage, observability, complexity and compatibility is not as such significant except a little higher mean score in compatibility. Although teachers have positive perception towards ICT, their use in the class room is very limited.

The culture perception of UAE teachers was between neutral and positive, and this was not improved even after the training. Moreover, the overall mean score before and after the training was almost equal. All the study participants agreed that computers should not be a priority in education. In general, one can conclude that the cultural perceptions of ICT among UAE teachers are similar to those teachers of Jordan, Syria and other parts of the Arab world.

The respondents had much competence in using computers. Interestingly, there is a positive relationship between computer competence and positive attitudes. Participants had sufficient access to computers. Interestingly, those who had a higher degree of computer access had more positive attitudes toward ICT than those with less access. The study indicated that all of UAE subject teachers had computer training although they had different duration of training. Similarly to computer competence and access, those who had greater chances for computer training held more positive attitudes toward ICT than those who did not.

The results of this study in relation to the demographic variables agree with the research that found little empirical support of the role of demographic variables in determining attitudes toward ICT (albirini, 2004). None of the demographic variables in this study had a significant relationship with teachers' attitudes toward ICT which, according to research, was expected

7.2 Recommendations

Based on the finding of this study, the following recommendations address the respective groups for whom the findings may be relevant.

The questionnaire used in this study was fully adopted from the previous study done by Albirini (2004). Specifically, the scale dealing with attitudes toward ICT contained items originally developed and tested in an earlier study. The findings of this study are likely to be generalizable to a similar population due to the use of both quantitative and qualitative procedure. This procedure provides richer and more comprehensive data (Baily-Beckett & Turner, nd). '*Quantitative procedure was necessary to guarantee a wider generalization of the results, and the qualitative part was necessary to provide plausible explanations for the quantitative data'* (Albirini, 2004).

The study managed to reach three different subject teachers with a wide range of experiences and with different demographic and computational backgrounds. In general, the teachers participating in this study may have similar characteristics to other subject teachers in the whole public-education system in UAE. Therefore, the findings might serve as a guideline for policy makers in the UAE.

However, for better generalization, future studies should be done with higher number of study subjects teachers' and their attitudes in other disciplines (i.e., other than Chemistry, Physics and Geography) need to be investigated. Moreover, schools with various backgrounds like western owned, Indian owned; governmental schools with different medium of instruction should also be included. All the study participants in this study were working in urban areas; therefore, further research is required in rural and semi-urban areas of Sharjah and other states.

Since all the study subjects were females in this study, future study should also include males. The data collection methods in this investigation were questionnaire and weekly journals, other data collection methods like in depth interview, observation, and focus group discussion should be considered for future investigation. Although they have positive attitudes towards ICT,

its application is limited; consequently, future studies should establish the root cause analysis for this occurrence.

The UAE strives to continuously improve its education system. The finding of this study can provide several implications for policy makers. The study highlighted the importance of considering the teachers, the end users, when introducing an innovation. This can relate to the achieving the MOE goals by ensuring the success of its initiatives and that teachers benefit from the experience with ICT.

The results of this study indicated that teachers generally had positive attitudes toward ICT. It is necessary for policy makers to support and enhance teachers' attitudes as a requirement for the success technology initiatives. Positive attitudes can serve as a predictor for future use of ICT by the teachers. Hence, policy makers can use these findings to equip them with the necessary skills to adopt the innovation.

Most of the teachers stated that ICT does not match their subject area. For this reason they are using ICT either for power point presentation or to display an illustration. Therefore, placing technology in schools will not result in education reform by itself; it has to be combined with innovativeness in academic and curricular approaches. Both policy-makers and teachers share this responsibility.

This study shows that formal ICT training based on the teachers' needs and ICT experience influence knowledge, skills, and attitude. Therefore, teachers specifically the older ones and normally those with more teaching experience need to be identified, and provided with specially designed training programs. The younger teachers are usually more technology savvy than the teachers with more teaching experience (Love, 2002). As suggested by Rakes et al (2006) appropriate training must be provided for teachers to help them integrate the technology in their teaching.

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Appendices

APPENDIX [A]

Dr. Hanif Hassan's Speech

'*The education reform plan has made tremendous advances, thanks to the interests of the UAE's Government in providing educational opportunities for all UAE nationals. The UAE's public schools have been provided with a modern IT infrastructure and extra-curricular activities and the Ministry of Education has signed a cooperation pact with IBM and the Emirates Telecommunications Corporation to upgrade all educational and technological facilities. Our goals are not restricted to upgrading services and educational facilities only, but raising the quality of education.'* (Hanif Hassan, 2009)

APPENDIX [B]

Teachers' Acceptance Model (TAM)

TAM places more emphasis on people's psychological tendencies and social influences. Therefore, 'beliefs, attitudes and intentions are important factors in the adoption of computer technologies.'(Bagozzi, Davis &Warshaw 1992, cited in Bates, Manuel & Oppenheim, 2007). TAM and Roger's Diffusion of Innovation theory [see chapter 2.4.2] were used in a study by Dimitrova and Chen (ND) in the United States to examine the effects of non-demographic characteristics on the uptake of e-government services. Perceived usefulness, perceived uncertainty and prior interest in these services, were found highly significant (Bates, Manuel &Oppenheim, 2007).

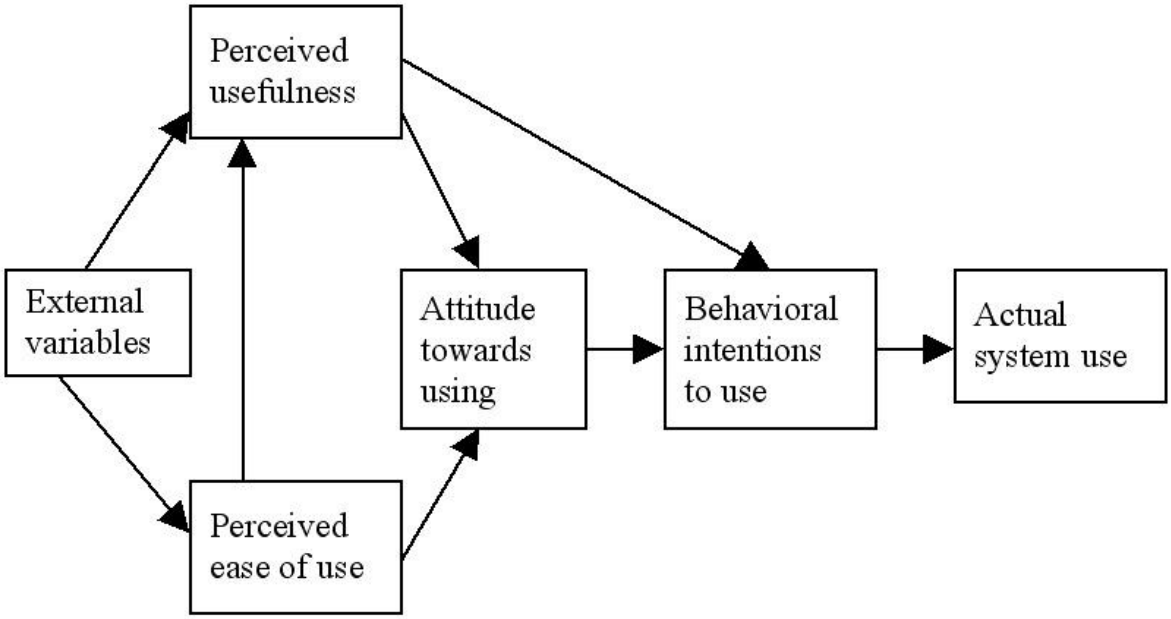


Figure 15.Technology acceptance model (Davis, Bagozzi & Warshaw, 1989: 985 cited in Darus&Luin, 2008).

The external variables characterize outside influences on teachers. Research shows that there are a number of factors affecting people's perceived ease of use in using ICT (Cox, Preston & Cox, 1999).

Positive factors	Negative factors
regular use and experience of ICT outside the classroom	difficulties in using software/hardware
ownership of a computer	need more technical support
confidence in using ICT	not enough time to use ICT
easy to control the class	is too expensive to use regularly
easy to think of new lesson ideas	insufficient access to the resources
can get help and advice from colleagues	restricts the content of the lessons

Table 7: Positive and negative factors affecting perceived ease of use. (Cox, Preston & Cox, 1999)

In order for teachers to adopt or use ICT, they need to see the necessity of making such change. They also need to see how positively this change affects their practice and their students' learning. There are several factors identified which contribute to teachers' perceived usefulness of ICT shown in the table 3 below:

Positive factors	Negative factors
makes my lessons more interesting	makes my lessons more difficult
makes my lessons more diverse	makes my lessons less fun
has improved the presentation of materials for my lessons	reduces pupils' motivation
gives me more prestige	impairs pupils' learning
makes my administration more efficient	restricts the content of the lessons
gives me more confidence	is not enjoyable
makes the lessons more fun	takes up too much time
enhances my career prospects	is counter-productive due to insufficient technical resources
helps me to discuss teaching ideas	

Table 8: Positive and negative factors influencing perceived usefulness (Cox, Preston & Cox, 1999)

APPENDIX [C]

QUESTIONNAIRE INSTRUMENT (ARABIC VERSION)

- **الجامعة البريطانية - دبي**
- **آراء المدرسين في تقنية الحاسب**
- **تعليمات عامة :تهدف هذه الإستبانة إلى معرفة رأيك من إدخال تقنية المعلومات (الحاسب) إلى قطاع التعليم في الامارات . تتألف الإستبانة من ستة أقسام .يبتدأ آل قسم ببعض التعليمات التي تخص ذلك القسم فقط .قبل أن تبدأ بالإجابة على آل قسم الرجاء قراءة التعليمات بدقة ثمَّ الإجابة بصراحة حسب الشكل المطلوب**

تعليمات(1) من فضلك ضع دائرة حول الرقم الذي يحدد مدى موافقتك أو عدم موافقتك مع كل من العبارات التالية .الرجاء اللإجابة على جميع الفقرات

		اعارض بشده	اعارض	غير متاكد	اوافق	اوافق بشدة
1	لا يخيفني الحاسب أبداً.	1	2	3	4	5
2	لا أشعر بالإرتياح تجاه الحاسب.	1	2	3	4	5
3	أنا سعيد لتوفر الحاسب بكثرة هذه الأيام.	1	2	3	4	5
4	لا أحب التحدث مع الآخرين عن الحاسب.	1	2	3	4	5
5	استخدام الحاسب شيء ممتع.	1	2	3	4	5
6	لا أحب أن أستخدم الحاسب في التدريس	1	2	3	4	5
7	يوفر الحاسب الوقت و الجهد.	1	2	3	4	5
8	ستكون المدارس أفضل بدون الحاسب.	1	2	3	4	5
9	يجب أن يستخدم الطلاب الحاسب في جميع المواد الدراسية.	1	2	3	4	5
10	تعلّم الحاسب مضيعة للوقت.	1	2	3	4	5
11	يحث الحاسب الطلاب على زيادة دراستهم	1	2	3	4	5
12	الحاسب وسيلة سريعة و فعالة للحصول على المعلومات.	1	2	3	4	5
13	لا أظن أني سأحتاج للحاسب في الصف أبداً	1	2	3	4	5
14	يعزز الحاسب تعلم الطلاب.	1	2	3	4	5
15	يضر الحاسب أآثر مما ينفع.	1	2	3	4	5
16	أُفضّل أن أعمل الأشياء بيدي على أن أعملها بالحاسب.	1	2	3	4	5
17	لو آان لديّ المال لا شتريتُ حاسباً خاصاً بي	1	2	3	4	5
18	سأحاول تجنب الحاسب قدر المستطاع.	1	2	3	4	5
19	أودّ تعلم المزيد عن الحاسب.	1	2	3	4	5
20	لا أنوي استخدام الحاسب في المستقبل القريب.	1	2	3	4	5

تعليمات(2) من فضلك ضع دائرة حول الرقم الذي يحدد مدى موافقتك أو عدم موافقتك مع كل من العبارات التالية .الرجاء اللإجابة على جميع الفقرات

		اعارض بشده	اعارض	غير متاكد	اوايد	اوايد بشدة
1	سوف يُحسّن الحاسب التعليم.	1	2	3	4	5
2	يمنح التدريس باستخدام الحاسب مزايا أفضل من التدريس باستخدام الطرق التقليدية.	1	2	3	4	5
3	لا يمكن لتقنية الحاسب أن تحسن نوعية تعلم الطلاب.	1	2	3	4	5
4	استخدام تقنية الحاسب يجعل المادة التعليمية أآثر تشويقاً.	1	2	3	4	5
5	لا يفيد الحاسب في تعلم اللغة.	1	2	3	4	5
6	لا مكان للحاسب في المدارس.	1	2	3	4	5
7	يتوافق استخدام الحاسب تماماً مع أهداف المنهج الدراسي.	1	2	3	4	5
8	لا يسمح وقت الحصة الدراسية الضيق باستخدام الحاسب في الصف	1	2	3	4	5
9	يتناسب إستخدام الحاسب مع ميول طلابي التعليمية و مع مستوى معرفتهم بالحاسب.	1	2	3	4	5
10	استخدام الحاسب مناسب لكثير من أنشطة تعليم اللغة.	1	2	3	4	5
11	من الصعب عليّ تعلم استخدام الحاسب في التدريس.	1	2	3	4	5
12	لا أجد أي صعوبة في فهم الوظائف التقنية للحاسب.	1	2	3	4	5
13	الحاسب يجعل مهمتي في الصف أآثر تعقيداً (صعوبة)	1	2	3	4	5
14	من السهل على أي أحد أن يتعلم استعمال الحاسب.	1	2	3	4	5
15	لم أرَ قط حاسباً في حالة عمل.	1	2	3	4	5
16	أأثبت الحاسب أنه وسيلة تعليمية فعالة على مستوى العالم.	1	2	3	4	5
17	لم أرَ قط حاسباً يستخدم آوسيلة تعليمية.	1	2	3	4	5
18	رأيتُ بعض المدرسين السوريين يستخدمون الحاسب لأغراض تعليمية	1	2	3	4	5

تعليمات(3) من فضلك ضع دائرة حول الرقم الذي يحدد مدى موافقتك أو عدم موافقتك مع كل من العبارات التالية .الرجاء اللإجابة على جميع الفقرات

		اعارض بشده	اعارض	غير متاكد	اوٰيد	اوٰيد بشدة
1	لن يغير الحاسب شيئاً في صفوفنا أو مدارسنا أو حياتنا.	1	2	3	4	5
2	يحتاج الطلاب إلى معرفة باستخدام الحاسب من أجل الحصول على مهن	1	2	3	4	5
3	الطلاب يفضلون التعلم من المعلم على التعلم من الحاسب.	1	2	3	4	5
4	تُكسب المعرفة بالحاسب احترام الآخرين.	1	2	3	4	5
5	نحتاج إلى حاسب يناسب الثقافة العربية و الهوية العربية.	1	2	3	4	5
6	سوف يساعدنا الحاسب على تحسين مستوى معيشتنا	1	2	3	4	5
7	لا يصرف استخدام الحاسب الأجيال العربية عن تعلم تراثها.	1	2	3	4	5
8	يزداد انتشار الحاسب في بلدنا بسرعة آبيرة جداً.	1	2	3	4	5
9	يستأثر ذوو المهارة بالحاسب على مزايا لا يحصل عليها غيرهم.	1	2	3	4	5
10	سيزيد الحاسب من اعتمادنا على البلاد الأجنبية	1	2	3	4	5
11	هناك الكثير من المسائل الإجتماعية التي يجب التطرق إليها قبل مسألة نشر الحاسب في مجال التعليم.	1	2	3	4	5
12	إن الإنتشار المتزايد للحاسب سيجعل الحياة أسهل	1	2	3	4	5
13	يجرد الحاسب المجتمع من القيم الإنسانية	1	2	3	4	5
14	لا يُضعف العمل على الحاسب علاقة الناس ببعضهم البعض.	1	2	3	4	5
15	يشجع الحاسب على انتشار اللاأخلاقيات	1	2	3	4	5
16	الحاسب يجب أن يكون من أولويات التعليم	1	2	3	4	5

تعليمات(4) : من فضلك ضع دائرة حول الرقم الذي يحدد مستوى مقدرتك بالحاسب
(أي مستوى معرفتك و مهارتك باستعمال الحاسب)

		ليس عندي مقدرة	مقدرة ضئيلة	مقدرة متوسطة	مقدرة كبيرة
1	تنزيل برنامج جديد على الحاسب..	1	2	3	4
2	استخدام الطابعة	1	2	3	4
3	استخدام لوحة المفاتيح	1	2	3	4
4	تشغيل برنامج محرر النص مثل :وورد	1	2	3	4
5	تشغيل برنامج عرض الشرائح مثل :باوربوينت	1	2	3	4
6	تشغيل برنامج جداول البيانات مثل :إآسل	1	2	3	4
7	انشاء قاعدة معلومات) بواسطة برنامج مثل :أآسس	1	2	3	4
8	استخدام شبكة الإتصالات العالمية الإنترنت (لأغراض اتصالية) مثل :البريد الإلكتروني و غرف الدردشة	1	2	3	4
9	استخدام شبكة الإتصالات العالمية الإنترنت للوصول إلى معلومات مختلفة	1	2	3	4
10	سيزيد الحاسب من اعتمادنا على البلاد الأجنبية	1	2	3	4
11	حل مشاآل بسيطة في عمل الحاسب.	1	2	3	4
12	تشغيل برنامج رسومات) مثل :فوتوشب	1	2	3	4
13	استخدام تقنية الحاسب لحفظ درجات الطلاب	1	2	3	4
14	إختيار و تقييم برامج حاسب تعليمية.	1	2	3	4
15	إنشاء و تنظيم الملفات على الحاسب.	1	2	3	4
16	إزالة فيروسات الحاسب.	1	2	3	4

تعليمات(5) : من فضلك حدد عدد المرات التي تستطيع فيها الوصول إلى الحاسب في كل من الامكنة التالية:

		أبداً	مرة في الشهر	مرة في الأسبوع	من 2-3 مرات في الأسبوع	يومياً
1	في المنزل	1	2	3	4	5
2	في المدرسة - مخبر الحاسب أو المكتبة	1	2	3	4	5
3	في أمكنة أخرى حدد من فضلك.....	1	2	3	4	5

تعليمات (6) ضع علامة (X) علي المربع الذي يحدد اجابتك علي الاسئلة الاتية :_

1	ماهو جنسك	# ذكر	# انثي			
2	كم عمرك	# بين ٢٠ و ٢٩	# بين ٣٠ و ٣	# بين 40 - 49	# بين 50-59	# 60 او اكثر
3	ما معدل دخلك أسرتك الشهري بالليرة السورية	# بين 5000 - 9000	# بين 10000- 14000	# بين 15000 - 19000	# 20000 - 24000	# 25000 او اكثر
4	كم عدد سنوات خبرتك في التدريس بما فيها هذه السنة	# من 1- 5	# من 6 - 10	# من 11- 15	# من 16 - 20	# 21 او اكثر
5	ما نوع المدرسة التي تدرس فيها	# في المدنية	# في ضواحي المدينة	# في الريف		
6	ما هي أعلى شهادة علمية حصلت عليها	# شهادة التأهيل التربوي	# إجازة جامعية	# شهادة ماجستير		
7	**هل سبق لك أن حضرت أي درس أو دورة تدريبية أو ندوة عن استخدام الحاسب الآلي	# لا	# نعم			
	**اذا اجابت بنعم برجاء ذكر عدد الساعات والايام	عدد الساعات	عدد الايام			

8 ما هي طريقة التدريس التي تستخدمها غالباً؟
□ .الفعالة المناقشة
□ الجماعية الأنشطة
□ الشرح
□ الأداء طريق عن التعلم
□ الإلقاء
□ أدوار لعب طريق عن التعلم
□ الحاسب بمساعدة التعليم
(أخرى) حدد من فضلك.....

QUESTIONNAIRE INSTRUMENT (ENGLISH VERSION)

The British University in Dubai
Attitudes toward Computer Technology

General Instructions: The purpose of this questionnaire is to examine your attitudes toward the introduction of information technology into UAE education. The questionnaire consists of six sections. Each section begins with some directions pertaining to that part only. As you begin each section, please read the directions carefully and provide your responses candidly in the format requested.

Section (1): Instructions*: Please indicate your reaction to each of the following statements by circling the number that represents your level of agreement or disagreement with it. Make sure to respond to every statement.*

		Strongly disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
1	Computers do not scare me at all.	1	2	3	4	5
2	Computers make me feel uncomfortable.	1	2	3	4	5
3	I am glad there are more computers these days.	1	2	3	4	5
4	I do not like talking with others about computers.	1	2	3	4	5
5	Using computers is enjoyable.	1	2	3	4	5
6	I dislike using computers in teaching.	1	2	3	4	5
7	Computers save time and effort.	1	2	3	4	5
8	Schools would be a better place without computers.	1	2	3	4	5
9	Students must use computers in all subject matters.	1	2	3	4	5
10	Learning about computers is a waste of time.	1	2	3	4	5
11	Computers would motivate students to do more study.	1	2	3	4	5
12	Computers are a fast and efficient means of getting information.	1	2	3	4	5
13	I do not think I would ever need a computer in my classroom.	1	2	3	4	5
14	Computers can enhance students' learning	1	2	3	4	5

15	Computers do more harm than good.	1	2	3	4	5
16	I would rather do things by hand than with a computer.	1	2	3	4	5
17	If I had the money, I would buy a computer.	1	2	3	4	5
18	I would avoid computers as much as possible.	1	2	3	4	5
19	I would like to learn more about computers.	1	2	3	4	5
20	I have no intention to use computers in the near future.	1	2	3	4	5

Section (2): Instructions*: Please indicate your reaction to each of the following statements by circling the number that represents your level of agreement or disagreement with it. Make sure to respond to every statement.*

		Strongly disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
1	Computers will improve education.	1	2	3	4	5
2	Teaching with computers offers real advantages over traditional methods of instruction.	1	2	3	4	5
3	Computer technology cannot improve the quality of students' learning.	1	2	3	4	5
4	Using computer technology in the classroom would make the subject matter more interesting.	1	2	3	4	5
5	Computers are not useful for language learning.	1	2	3	4	5
6	Computers have no place in schools.	1	2	3	4	5
7	Computer use fits well into my curriculum goals.	1	2	3	4	5
8	Class time is too limited for computer use.	1	2	3	4	5
9	Computer use suits my students' learning preferences and their level of computer knowledge.	1	2	3	4	5
10	Computer use is appropriate for many language learning activities.	1	2	3	4	5
11	It would be hard for me to learn to use the computer in teaching.	1	2	3	4	5
12	I have no difficulty in understanding the basic functions of computers.	1	2	3	4	5

13	Computers complicate my task in the classroom.	1	2	3	4	5
14	Everyone can easily learn to operate a computer.	1	2	3	4	5
15	I have never seen computers at work.	1	2	3	4	5
16	Computers have proved to be effective learning tools worldwide.	1	2	3	4	5
17	I have never seen computers being used as an educational tool.	1	2	3	4	5
18	I have seen some Syrian teachers use computers for educational purposes.	1	2	3	4	5

Section (3): Instructions*: Please indicate your reaction to each of the following statements by circling the number that represents your level of agreement or disagreement with it. Make sure to respond to every statement.*

		Strongly disagree	*Disagree*	*Neutral*	*Agree*	*Strongly agree*
1	Computers will not make any difference in our classrooms, schools, or lives.	1	2	3	4	5
2	Students need to know how to use computers for their future jobs.	1	2	3	4	5
3	Students prefer learning from teachers to learning from computers.	1	2	3	4	5
4	Knowing about computers earns one the respect of others.	1	2	3	4	5
5	We need computers that suit better the Arabic culture and identity.	1	2	3	4	5
6	Computers will improve our standard of living.	1	2	3	4	5
7	Using computers would not hinder Arab generations from learning their traditions.	1	2	3	4	5
8	Computers are proliferating too fast.	1	2	3	4	5
9	People who are skilled in computers have privileges not available to others.	1	2	3	4	5
10	Computers will increase our dependence on foreign countries.	1	2	3	4	5
11	There are other social issues that need to be addressed before implementing computers in education.	1	2	3	4	5
12	The increased proliferation of computers will make our lives easier.	1	2	3	4	5
13	Computers dehumanize society.	1	2	3	4	5

14	Working with computers does not diminish people' relationships with one other.	1	2	3	4	5
15	Computers encourage unethical practices.	1	2	3	4	5
16	Computers should be a priority in education.	1	2	3	4	5

Section (4): Instructions*: Please indicate your current computer competence level (i.e., both your knowledge of and your skill in using computers) regarding each of the following statements. Make sure to respond to every statement.*

		Much competence	*Moderate competence*	*Little competence*	*No competence*
1	Install new software on a computer.	1	2	3	4
2	Use a printer	1	2	3	4
3	Use a computer keyboard	1	2	3	4
4	Operate a word processing program (e.g., Word).	1	2	3	4
5	Operate a presentation program (e.g., PowerPoint).	1	2	3	4
6	Operate a spreadsheet program (e.g., Excel).	1	2	3	4
7	Operate a database program (e.g., Access)	1	2	3	4
8	Use the Internet for communication (e.g., email & chatroom)	1	2	3	4
9	Use the World Wide Web to access different types of information.	1	2	3	4
10	Solve simple problems in operating computers.	1	2	3	4
11	Operate a graphics program (e.g., Photoshop).	1	2	3	4
12	Use computers for grade keeping.	1	2	3	4
13	Select and evaluate educational software.	1	2	3	4
14	Create and organize computer files and folders.	1	2	3	4
15	Remove computer viruses	1	2	3	4

***Section (5): Instructions**: Please identify how often you have computer access in the following contexts:*

		Never	*Once a month*	*Once a week*	*2 or 3 times a week*	*Daily*
1	In your home	1	2	3	4	5
2	At school (computer lab or library)	1	2	3	4	5
3	Other (like Internet cafes, etc.)	1	2	3	4	5

***Section (6): Instructions**: Please indicate you response to the following questions by checking the appropriate boxes:*

1	What is your **gender**? □ Male □ Female
2	What is your **age**? □ 20- 29 □ 30-39 □ 40-49 □ 50-59 □ 60 and over
3	What is your **monthly** average **household income** in Syrian Liras? □ 5,000—9,000 □ 10,000—14,000 □ 15,000—19,000 □ 20,000-24,000 □ 24,000 and over
4	Including the current year, how many **years** have you been teaching? □ 1-5 □ 6-10 □ 11-15 □ 16-20 □ over 20
5	In what **type of school** do you teach? □ Urban □ Suburban □ Rural
6	What is your highest completed academic **degree**? □ Teacher Certificate □ Bachelors □ Master's
7	***Have you ever attended any training course, workshop, or seminar on using computers?*** □ No □ Yes. If "Yes", please specify the number of hours and/or days: _____hours _____days
8	What is the **teaching method** you use most often? □ Active discussion □ Collaborative activities □ Demonstration □ Hands-on learning □ Lecturing □ Role playing □ Computer-assisted instruction □ Other (please specify): .....

Thank you very much for your response.

APPENDIX [D]

Journal (ARABIC)

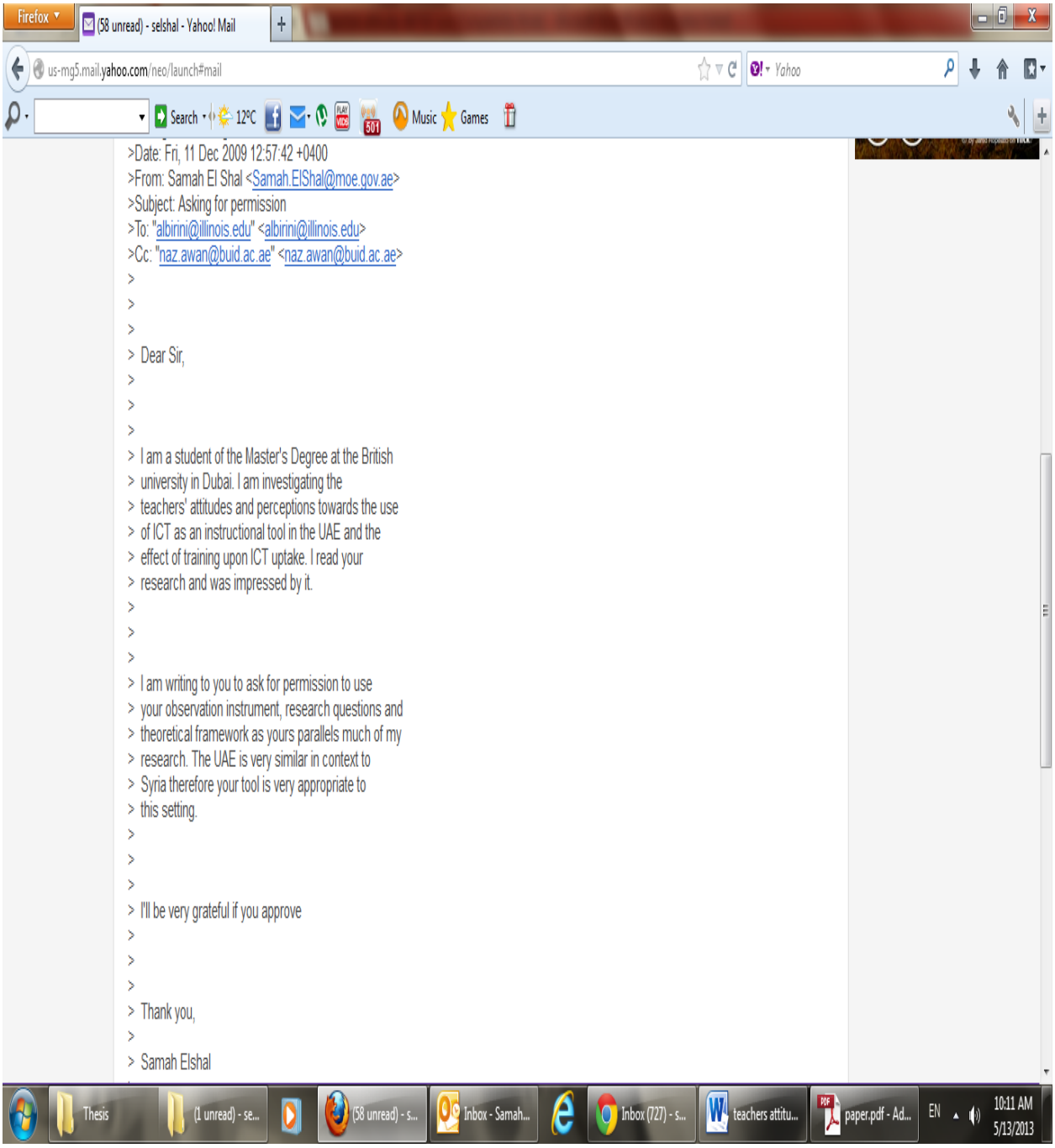
1	ما هو نوع الدرس لهذا اليوم؟
2	ما هي التقنيات التي استخدمتها؟ و كيف استخدمتها؟ و لماذا؟
3	هل ذكرت هذه التقنيات في الخطة الدرسية؟ كيف؟ (يرجي ارفاق نسخة من الخطة الدرسية) لماذا ذكرتيها او لا؟
4	ما هي طريقة التدريس التي استخدمتها اليوم؟
5	هل خدم استخدام التقنيات الدرس؟ كيف؟
6	كيف تفاعلت الطالبات مع استخدام التقنيات؟ هل كان لهن دور اثناء الاستخدام؟
7	هل يناسب استخدام التقنيات طبيعة درس اليوم؟

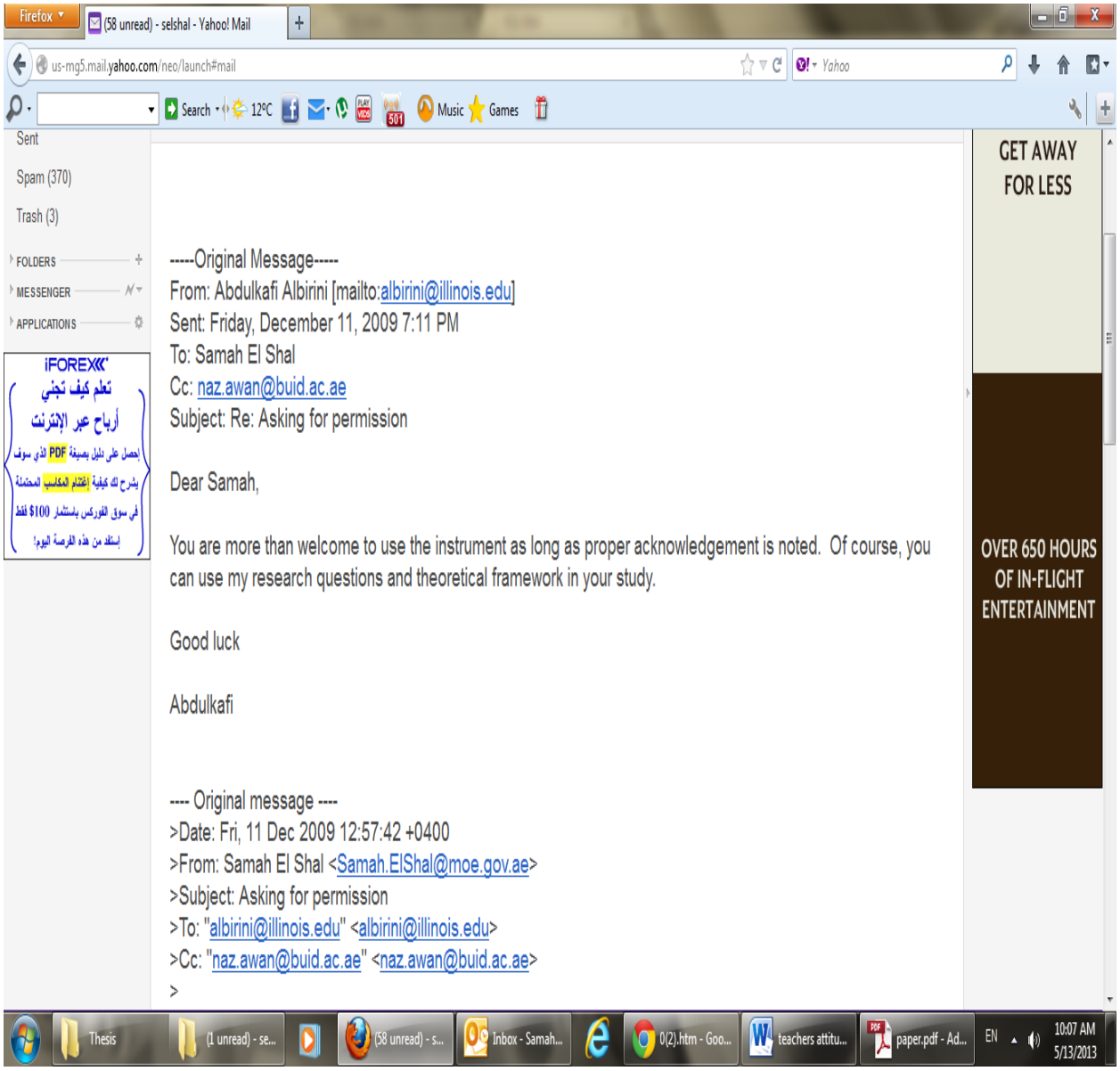
Journal (ENGLISH)

1	**What is the lesson for today?**
2	**What technologies did you use? How? And why?**
3	**Did you mention these technologies in your lesson plan? How? (please attach a copy of your lesson plan) why did you mention it/ or not?**
4	**What is the teaching methodology used today?**
5	**Was using the technology useful? How?**
6	**How did the students interact with the technology used? Did they have a part?**
7	**Was using the technology suitable for the nature of the lesson?**

APPENDIX [E]

Researcher's Permission to use his Questionnaire




Firefox
(58 unread) - selshal - Yahoo! Mail
us-mg5.mail.yahoo.com/neo/launch#mail
Search
12°C
Music
Games
Sent
Spam (370)
Trash (3)
FOLDERS
MESSENGER
APPLICATIONS
iFOREX
تعلم كيف تجني
أرباح عبر الإنترنت
احصل على دليل بصيغة PDF الذي سوف
يشرح لك كيفية اقتناص المكاسب المحتملة
في سوق الفوركس باستثمار $100 فقط
استفد من هذه الفرصة اليوم!
-----Original Message-----
From: Abdulkafi Albirini [mailto:albirini@illinois.edu]
Sent: Friday, December 11, 2009 7:11 PM
To: Samah El Shal
Cc: naz.awan@buid.ac.ae
Subject: Re: Asking for permission
Dear Samah,
You are more than welcome to use the instrument as long as proper acknowledgement is noted. Of course, you can use my research questions and theoretical framework in your study.
Good luck
Abdulkafi
---- Original message ----
>Date: Fri, 11 Dec 2009 12:57:42 +0400
>From: Samah El Shal <Samah.ElShal@moe.gov.ae>
>Subject: Asking for permission
>To: "albirini@illinois.edu" <albirini@illinois.edu>
>Cc: "naz.awan@buid.ac.ae" <naz.awan@buid.ac.ae>
>
GET AWAY
FOR LESS
OVER 650 HOURS
OF IN-FLIGHT
ENTERTAINMENT
Thesis
(1 unread) - se...
(58 unread) - s...
Inbox - Samah...
0(2).htm - Goo...
teachers attitu...
paper.pdf - Ad...
EN
10:07 AM
5/13/2013

APPENDIX [F]

Cover Letter (ARABIC)

عزيزتي المعلمة،

أقوم حاليا بإعداد بحث علمي عن انتشار تقنية المعلومات (الحاسب الالي) في مدرسة بالشارقة تابعة لوزارة التربية و التعليم بدولة الإمارات العربية المتحدة. يهدف هذا البحث إلي معرفة اراء معلمات المواد المختلفة بالمرحلة الثانوية تجاه استخدام تقنية المعلومات في التعليم و العوامل المؤثرة في هذه الاراء.

تنبغي الإشارة إلي أن أفضل معلومات عند وضع الحاسب الالي في مدارس الإمارات يأتي من المعلمين و المعلمات, هذا النوع من المعلومات مفيد لإتخاذ قرارات تتعلق بالخطط المستقبلية لتزويد المدارس بتقنية المعلومات.

تستغرق الإجابة علي هذه الإستبانة حوالي عشر دقائق. من فضلك أكملي الإستبانة و اكتبي ملاحظاتك حسب الحاجة. علماً بأن إجابتك طوعية و لن تؤثر علي عملك. ستعامل كل الأجوبة بسرية و تنقل المعلومات كمجموعة عند كتابة البحث.

شكرا لكِ علي تقديم المعلومات القيمة. إذا أردت الحصول علي نتائج البحث الرجاء التواصل علي

selshal@yahoo.com

سماح الشال

Cover Letter (ENGLISH)

Dear Teacher,

I'm currently conducting a study on teachers' attitudes towards using Information and Communication Technology Education. The study seeks to determine the attitudes of the teachers of different subject areas towards using the technology and the factors that may have influenced these attitudes. The best information about technology status in the UAE comes from the teachers. This type of information is useful in decision making concerning future technology implementation plans.

Taking this survey is voluntary, and your job will not be affected in any way by whether or not you take the survey. This survey will take approximately 10 minutes to complete. Please complete the survey and feel free to make notes on the survey as needed. All information will be treated confidentially. Further, responses will be treated only as group data in the written report.

Thank you for providing this valuable information. If you would like to receive the results of this study, please contact me at selshal@yahoo.com

Your time and effort in completing the survey are greatly appreciated.

Sincerely,

Samah Elshal

APPENDIX [G]

Letter of Consent (ARABIC)

موافقة علي الاشتراك في بحث

أوافق علي الإشتراك في هذا البحث الذي يحمل عنوان " العوامل المؤثرة علي مواقف المعلمين تجاه استخدام تقنية المعلومات و تأثير التدريب علي هذه العوامل."

قامت الباحثة بشرح غرض البحثو الإجراءات المطلوب إتباعها و مدة مشاركتي فيه، كما شرحت الفوائد المحتملة للبحث. أقر بأني حصلت علي معلومات إضافية تتعلق بالدراسة و تلقيت أجوبة مرضية عن أسئلتي, كما أني أعي بأني حرة في سحب موافقتي في أي وقت و إيقاف مشاركتي في الدراسة بدون أي ضرر يلحق بي.

أخيراً, أقر بأني قرأت و فهمت نموذج الموافقة و وقعتها بملء إرادتي و حريتي و قد حصلت علي نسخة منها

التاريخ ..../..../2010

التوقيع _____

المعلمة المشاركة

التوقيع _____

سماح الشال

Letter of Consent (ENGLISH)

I consent to participating in a research entitled 'Teachers' Attitudes and Perceptions towards the Use of Information and Communication Technology (ICT) in Education and the Effect of Training upon ICT Uptake'.

The researcher has explained the purpose of the study, the procedures to be followed and the expected duration of my participation. Possible benefits of the study have been described.

I acknowledge that I have had the opportunity to obtain additional information regarding the study and that the questions I have raised have been answered to my full satisfaction. Furthermore, I understand that I am free to withdraw my consent at any time and to discontinue participation in the study without prejudice to me.

Finally, I acknowledge that I have read and fully understand the consent form. I sign it freely and voluntarily. A copy have been given to me.

Date …/…/2010

Sign _____

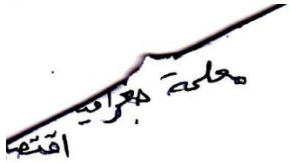
The participant

Sign _____

Samah Elshal

APPENDIX [H]

Geography Teacher



يوميات

ما هو نوع الدرس لهذا اليوم؟ قارة أمريكا الشمالية - للصف التاسع
(الملامح العامة لقارة أمريكا الشمالية)

ما هى التقنيات التى استخدمتها؟ و كيف استخدمتها؟ و لماذا؟ Power point presentation
- استخدام الكمبيوتر (powerpoint) + الداتا شو
- عن طريق شرح الخريطة واستخدام الصور لتوصيل المعلومة بشكل سريع ومفهوم وتثبيت المعلومات لدى الطالب

هل ذكرت هذه التقنيات فى الخطة الدرسية؟ كيف؟ (يرجى ارفاق نسخة من الخطة الدرسية). لماذا ذكرتيها او لا؟
Included in objectives
نعم
لتكون ضمن الأهداف المراد تحقيقها لتوصيل المعلومات بشكل مفهوم وليس بالحفظ

Geography

ما هى طرقة التدريس التى استخدمتها اليوم؟
- استخدام الخريطة وتحديد ملامح أمريكا الشمالية وتحديد المسطحات المائية والدول المجاورة وأهم ملامح أمريكا الشمالية.
- حل الانشطة التي في الكتاب Aswering exercises
- سؤال ختامي نهاية الحصة. Evaluation question

هل خدم استخدام التقنيات الدرس؟ كيف؟

نعم

توضيح معالم أمريكا الشمالية والتعرف عليها

Displaying features of North America

كيف تفاعلت الطالبات مع استخدام التقنيات؟ (هل كان لهن دور اثناء الاستخدام؟)

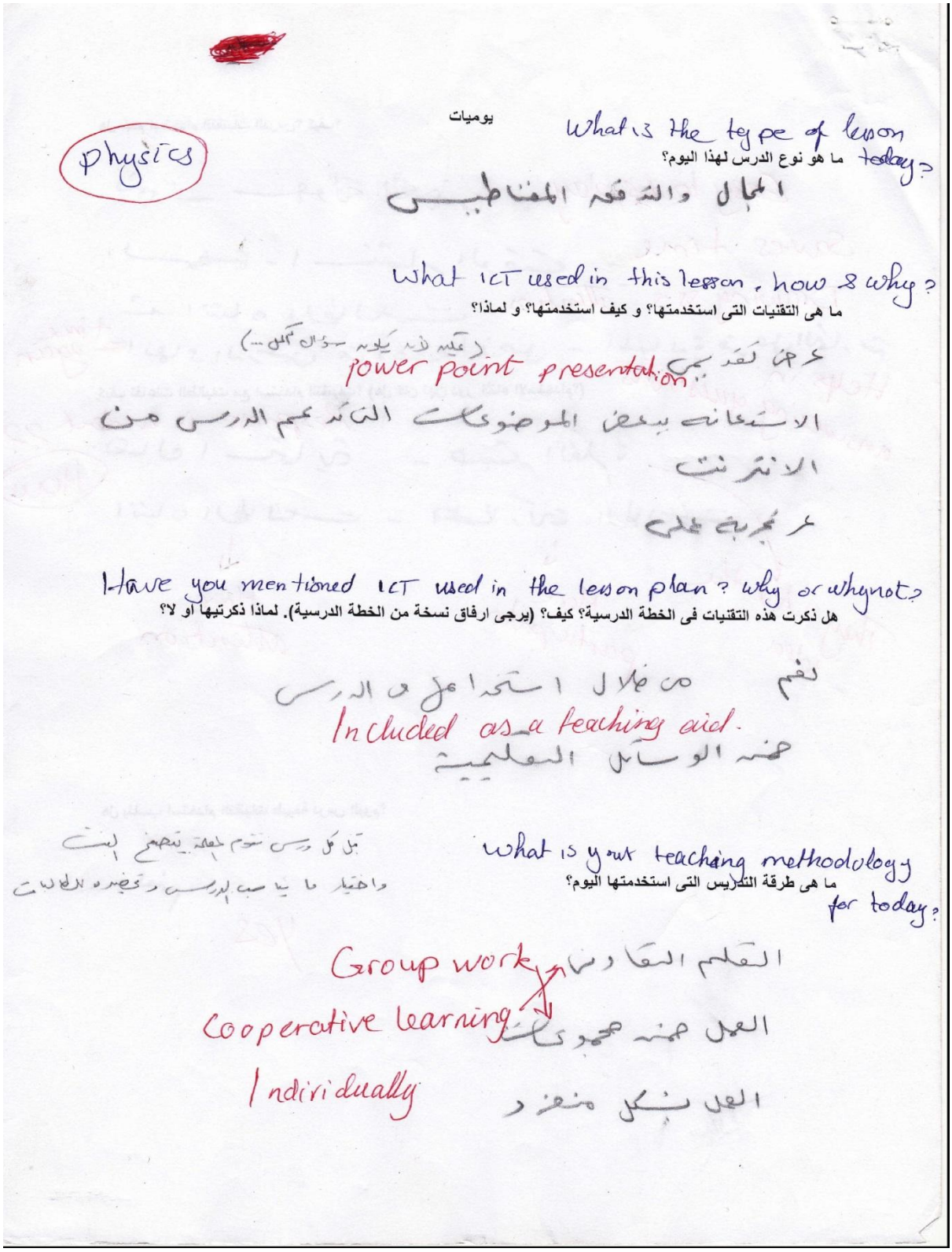
نعم - عن طريق مشاركتهن في تحديد ملامح أمريكا الشمالية Yes

على الخريطة

They participated in Defining the Map

هل يناسب استخدام التقنيات طبيعة درس اليوم؟

نعم Yes



يوميات

physics

What is the type of lesson today?
ما هو نوع الدرس لهذا اليوم؟

المجال والتدفق المغناطيسي

What ICT used in this lesson, how & why?
ما هى التقنيات التى استخدمتها؟ و كيف استخدمتها؟ و لماذا؟

(عليه أن يكون سؤال كامل ...)

power point presentation

الاستعانة ببعض المواقع التى تدعم الدرس من الانترنت

عرض تجربة على

Have you mentioned ICT used in the lesson plan? why or whynot?
هل ذكرت هذه التقنيات فى الخطة الدرسية؟ كيف؟ (يرجى ارفاق نسخة من الخطة الدرسية). لماذا ذكرتيها او لا؟

نعم من خلال استخدامى فى الدرس

Included as a teaching aid.

ضمن الوسائل التعليمية

قبل كل درس نقوم بعقد تجمع لبث واختيار ما يناسب الدرس وتحضيره للطالبات

What is your teaching methodology for today?
ما هى طرقة التدريس التى استخدمتها اليوم؟

التعلم التعاونى

Group work

Cooperative learning

العمل ضمن مجموعات

Individually

العمل بشكل منفرد

هل خدم استخدام التقنيات الدرس؟ كيف؟

نعم - سهولة العرض Easy to display

السرعة - استثمار الوقت Saves time

شد انتباه الطالبات Drawing ss's attention

انهاء الدرس في وقت افضل ← time again - المساعدة في حل الاسئلة Helps in answering questions

كيف تفاعلت الطالبات مع استخدام التقنيات؟ (هل كان لهن دور اثناء الاستخدام؟)

Response is evident ??

هناك استجابة - حب الفكرة (How)

انتباه الطالبات - المشاركة الطالبات

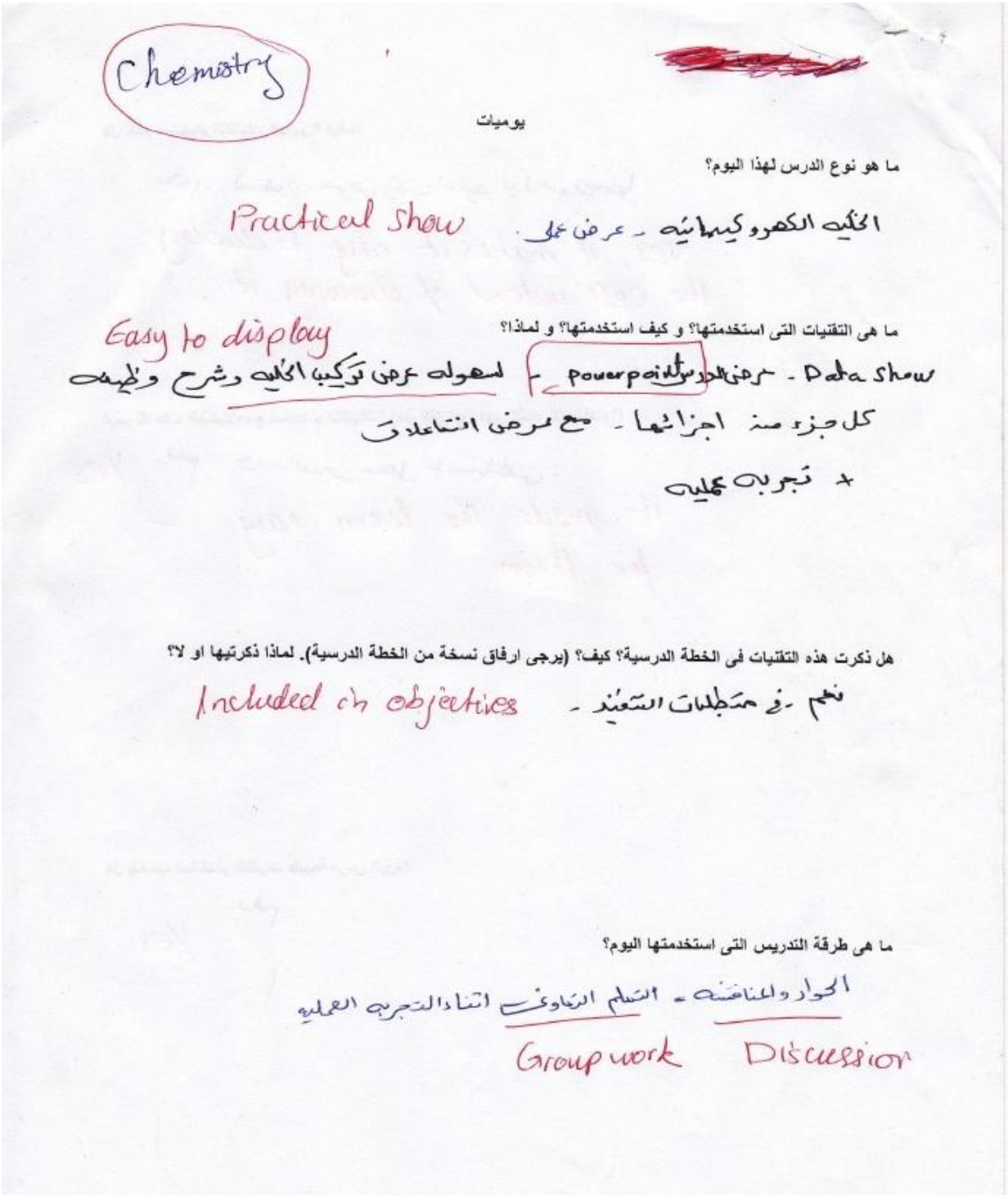
They liked the idea — More participation — More attention

هل يناسب استخدام التقنيات طبيعة درس اليوم؟

نعم

Yes.

Chemistry Teacher


Chemistry

يوميات

ما هو نوع الدرس لهذا اليوم؟

Practical Show عرض عملي - الخلية الكهروكيميائية

ما هى التقنيات التى استخدمتها؟ و كيف استخدمتها؟ و لماذا؟

Easy to display

لسهولة عرض تركيب الخلية وشرح وظيفة - powerpoint عرض الدرس - Data show

كل جزء من اجزائها - مع عرض انتاعلاق

+ تجربة عملية

هل ذكرت هذه التقنيات فى الخطة الدرسية؟ كيف؟ (يرجى ارفاق نسخة من الخطة الدرسية). لماذا ذكرتيها او لا؟

Included in objectives نعم - في متطلبات التعليم -

ما هى طرقة التدريس التى استخدمتها اليوم؟

الحوار والمناقشة - التعلم التعاوني اثناء التجربة العملية

Group work Discussion

هل خدم استخدام التقنيات الدرس؟ كيف؟

نعم- لسهوله عرض تركيب الخليه بدل من رسمها

Yes, it makes it easy to display the cell instead of drawing it.

كيف تفاعلت الطالبات مع استخدام التقنيات؟ (هل كان لهن دور إثناء الاستخدام؟)

نعم Yes كان الدرس سهل بالنسبه لهن.

It made the lesson easy for them

هل يناسب استخدام التقنيات طبيعة درس اليوم؟

نعم

Yes.