COMPUTER INTEGRATION IN PALESTINIAN SECONDARY SCHOOLS: THEORY AND PRACTICE

Item Type	Dissertation (Open Access)
Authors	Barham, Kefah A.
DOI	10.7275/h7h8-j587
Download date	2025-09-08 10:16:55
Link to Item	https://hdl.handle.net/20.500.14394/19753

COMPUTER INTEGRATION IN PALESTINIAN SECONDARY SCHOOLS: THEORY

AND PRACTICE

A Dissertation Presented

by

KEFAH A. BARHAM

Submitted to the Graduate School of the

University of Massachusetts Amherst in partial fulfillment

of the requirements for the degree of

DOCTOR OF EDUCATION

May 2014

Education

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DEDICATION

I dedicate this dissertation to my wonderful family, especially to my understanding and patient husband, Abdelrahim. Words cannot express my love and gratitude for your love, support, encouragement, and assistance. It is also dedicated to my beloved children, Mohamad, Mahmud, Rasha, and Ryan, who have supported me in my never-ending quest for knowledge.

I dedicate this dissertation to my wonderful mother; her continuous prayers were a ray of light illuminating my path. I dedicate it to the soul of my brother Isamel, whom I lost while writing the last pages of this dissertation. He was a great help and support throughout my knowledge-seeking journey, particularly during data collection stage.

ACKNOWLEDGMENTS

thanks to Ibrahim Absa, Ansam Barham, Monther Qadoos, Manal Barham, Ricardo Gomes, and other family members, relatives, and friends who helped me during my study.

Deep thank goes to my sincere loving husband Abdelrahim for all his support, encouragement and for giving me someone to lean on. I am blessed to have him in my life.

ABSTRACT

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PRACTICE

MAY 2014

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The overarching exploratory question that guides this study is: "How can Palestinian secondary schools move forward and integrate computer technology effectively into education?" For the purpose of this study, computer technology integration is defined as the use of computing devices such as desktop computers, laptops, software applications and the Internet, and peripheral devices, such as printers, scanners, digital cameras, and overhead projectors for instructional purposes in Palestinian secondary schools in the cities of Ramallah & Al Bireh and Qalqilia & Azoon.

The purpose of this study is to identify ways to help teachers working at the Palestinian Ministry of Education and Higher Education (MoEHE) integrates computer technology into their teaching. This study will explore how teachers use computer technology in schools as well as how the Palestinian MoEHE stance computer integration into schools. The study also provides recommendations for ways to help close the gap between the vision and practice. To achieve the above, a Triangulation mixed method design was used to converge both quantitative data from surveys and qualitative data in the form of interviews and document analysis.

Although the Palestinian MoEHE sees computer technology the primary means of improving the educational process and moving toward a student-centered approach, this study has

found that integration of technology into Palestinian schools is still oriented toward a traditional approach. This study presents some recommendations to help break that disparity between the vision and the real practice of computer integration.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Figure	Page

CHAPTER 1

INTRODUCTION AND PROBLEM STATEMENT

1.1 Introduction

Computer technology in today's world is used for almost every task in our lives. We use technology to accomplish daily tasks such as paying bills, buying groceries, managing bank accounts, or communicating with friends. The potential for computers to significantly enhance learning and teaching is the most important reason for introducing computers into schools and integrating them into all aspects of education (Rastogi & Malhtra, 2013; Raman & Mohamed, 2013). Students report that technology, when used appropriately, can greatly enhance educational productivity in terms of achievement, learning styles, attitudes, cooperative work and ability to access information (Yildirim & Cakir, 2013). According to United Nations Educational Scientific and Cultural Organization (UNESCO, 2002), computer technology has the potential to transform the teaching and learning process from teacher-centered classrooms to rich, interactive, student-centered classrooms and to teach students the knowledge and skills they need to compete in the 21st century. This persuasive argument validates the increasing international pressure to use computer technology in schools. It has also increased awareness among policy makers and educators that the education system needs to be reformed to equip students with the knowledge, attitudes and skills that they need to succeed in the knowledge economy (Rastogi & Malhtra, 2013).

The Palestinian MoEHE and Higher Education (MoEHE) launched the Palestinian Education Initiative (PEI, 2008). This initiative was designed to contribute to the Educational Development Strategic Plan's (EDSP, 2008-2012) efforts to improve the quality of education in Palestine (Palestinian MoEHE, 2007). The PEI calls for the increased use of technology in the education system. This initiative is considered the framework that governs and coordinates all national and international projects in Palestine in regards to technology.

Due to the lack of research and analysis on the topic of technology integration in schools in Palestine (Palestinian MoEHE, 2007), there is an urgent need for studies that explore the situation in the schools and provide rigorous analyses on how computers are being used in schools. Teachers are gatekeepers of the way technology is used in the classroom, and their decisions reflect their pedagogical and epistemological beliefs in terms of technology. Therefore, it is important to investigate teachers' perspectives and beliefs in Palestinian schools in regards to integrating computer technology in the classroom.

The purpose of this study is to explore and identify ways to help MoEHE teachers in Palestine to effectively integrate computer technology into instruction in order to help students develop the knowledge and skills needed to have successful 21st century careers. In this study, I first identify the Palestinian MoEHE goals and vision for integrating technology into schools, then explore the current situation in Palestinian schools in regards to computer technology integration. The Force Field Analysis of the literature will be used to help identify the gap between the Palestinian MoEHE's vision and current situation in schools in terms of computer technology integration and provide suggestions to help Palestinian schools move forward in computer technology integration.

I used a mixed method design that combines both quantitative and qualitative research methodsto generate and confirm the results of the study and develop a better understanding of the research problem. I also used survey data to explore how computer technology is being used in schools. Concurrent with the data collection, I also used document analysis to identify the goals and vision of the MoEHE for integrating computers into schools and interviews to explore teachers' beliefs and attitudes about computer integration into school.

1.2 Statement of the Problem

The younger generation is entering a world that is changing in many aspects: scientific, political, economic and social. The emergence of a "knowledge based society" is changing the

global economy and status of education across the world (UNESCO, 2002). According to UNESCO (2002), computer technology is a major factor in shaping the new global economy and producing rapid change in society. Technology has changed the way we communicate and do business. It also has the potential to transform the nature of education. It changes how and where students are able to learn and redefine the role of teacher and student. Computer technology can transform the present teacher-centered classrooms into rich student-interactive learning environments. This argument validates the increasing push towards the integration of computer technology into education. Technology by itself might not lead to that change; rather it is the way in which teachers integrate technology that has the potential to bring about change in the education system (Rastogi & Malhtra, 2013).There is a growing awareness in countries, including Palestine, that the educational system that was designed to provide students with skills for industrial- or agrarian-based economies will not provide students with the skills and knowledge they need for the knowledge-based economy with its focus on computer technology (UNESCO, 2002).

Recognizing the challenges of the ''information age,'' the Palestinian MoEHE took steps to prepare students for 21st century knowledge-based economy. These steps included: the introduction of English-language instruction starting from the first grade to help students get a head start on language and the learning of communication technology; the introduction of a new technology curriculum that addresses many of the topics of information and communication technology in grades 5-10; the creation of more computer labs and internet communication; and a significant increase in the number of computer labs in schools. For example, Wahbeh(2006) reveals how computer lab usage is increasing over time.

Table 1: Percentage of Schools with Computer Labs by Year and Supervising Authority

Supervising Authority	Year		
	2005/2006	2006/2007	2007/2008

Government	56.7%	92.9%	95.6%
UNRWA	27.2%	92.0%	90.9%
Private	67.3%	91.7%	90.3%
Total	54.3%	92.6%	94.4%

Source: Palestinian Central Bureau of Statistics, 2010

According to the Palestinian MoEHE, the integration of computers and computer technology into Palestinian education aims to improve the quality of education and enhance a student-centered learning process that provides skills, knowledge and experience that will lead to "employment and an entrepreneurial mindset" (Palestinian MoEHE, 2009, p.16).

In 2008, the MoEHE launched PEI. The ultimate goal of the initiative is to contribute to the overall objective of the Educational Development Strategic Plan 2008-2012 (EDSP) of improving the quality of education in Palestine (Palestinian Ministry of Education and Higher Education, 2009). Palestine has only begun to integrate technology into schools, in what UNESCO names "the emerging approach," meaning that schools have begun to purchase or receive donations of computing equipment and software. In this phase administrators and teachers are just starting to explore the possibilities and consequences of using Information Communication Technology (ICT) in school management and adding it to the curriculum (UNESCO, 2002).

Due to the lack of research that has been carried out on the topic of technology integration in schools (Palestinian MoEHE, 2007), there is an urgent need for studies that explore the situation in schools and provide data and information on how computers are being used in schools, what are teachers' perspectives and beliefs in regard to computer integration into education.

1.3 The Purpose of the Study

The purposes of this study are to 1) describe and analyze current uses of computer technology in schools; 2) analyze teachers' perceptions about barriers to effective integration of

technology; 3) shed light on the Palestinian MoEHE vision for computer integration; 4) analyze

the possible gap between MoEHE's vision and current practice; and 5) offer strategies to

Palestinian MoEHE teachers for integrating computer technology effectively into schools.

I will analyze the driving and barriers to computer technology integration in the literature

so that I can provide some recommendations for moving forward with the integration of computer

technology into schools. The figure below illustrates the research motives and objectives.
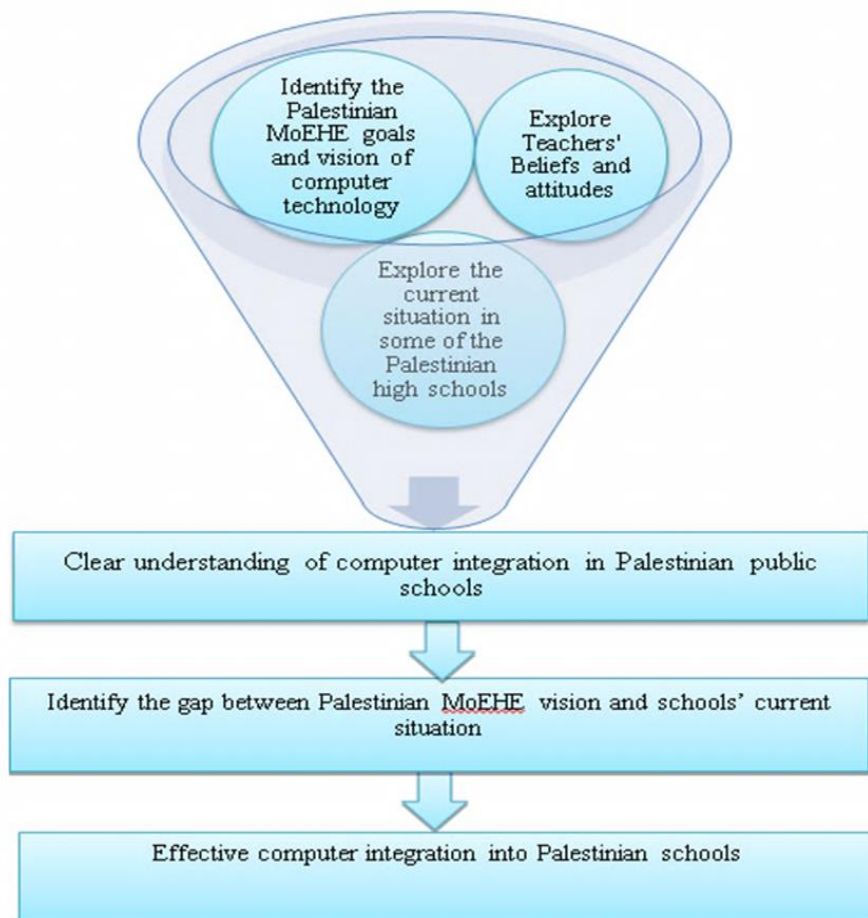
Figure 1: Motives and Objectives of the Research

The research posed the following specific research questions:

1. What are teachers' experiences of computer integration?

    1.1. Do teachers have access to computer technology?

1.2. How do teachers talk about computer use in classrooms and what are the reasons for this use?

1.3. What are teachers' pedagogical beliefs and attitudes about integrating computers into their teaching?

1.4. How well do teachers feel they are prepared to integrate computers into their instruction?

1.5. What factors influence how Palestinian public school secondary teachers in integrating computer technology into their teaching?

1.6. What are the barriers that prevent teachers from using computers into their instruction?

2. How does the Palestinian MoEHE view the use of computer technology in the classroom?

2.1. How well does the MoEHE policy match teachers' teaching practices?

2.2. What kind of support does the MoEHE provide to teachers to integrate computers effectively into education?

2.3. What strategies does the MoEHE use to integrate computers into education?

3. What are possible strategies to help integrate computer technology effectively into schools?

3.1 What is the gap between the PEI goals and the current situation in schools

3.2 What is known in the literature about effective computer technology integration?

1.4 Potential Significance of the Study

Over the years, we have heard about cases where computer technology had a positive impact in teaching and learning. On the other hand, there were many cases where the school districts' investments in technology were not well-used or to have been used improperly. This study is important in the context Palestinian education for several reasons:

▪ It presents a clear picture of how computers are being integrated into Palestinian schools especially since little research has been done on that topic.

- Because the lack of research on the topic of technology integration in Palestinian schools (Palestinian MoEHE, 2007), this research contributes to the literature on technology integration into Palestinian schools. It is also important for policy makers to take into account teachers' perceptions and the level of computer use among teachers during planning.

1.5 Limitations of the Study

The main limitations of this study were the time constraints. Due to the time limitations, I was not able to conduct classroom observations. Therefore I was not able to supplement the interview data with actual classroom observations. So the validity of the data hinges completely on whether or not the interviewees provided honest answers in the interviews.

In order for effective qualitative research to take place, adequate time is needed to interact with the participants in the field. Accordingly, the time for this research was 2 months period and insufficient to have such interactions. Some of research question as well rely on teacher self-reports, especially in parts that deal with teachers' competency and capability of using computer technology.

This was a small-scale study which included interviews from three levels within the education system: schools (and more specifically teachers), regional supervisors, and some policy makers. These participants do not represent all teachers or supervisors. The study also included the results of a questionnaire distributed to high school teachers in Ramallah & Al Bireh, and Qalqilia & Azoon in West Bank. Those schools do not represent all high schools in Palestine. Therefore the results of this study cannot be generalized to the larger population.

1.6 Challenges in Conducting the Study

One of the challenges I faced while creating this methodological design is that much effort and expertise was required because of concurrent data collection and the fact that equal weight was given to each data type (Creswell & Plano Clark, 2007). According to Creswell and

Plano Clark (2007), this methodology requires expertise in both quantitiative and qualitaitve methods. Fortunately I got the support I needed to cope with this challenge. My graduate committee advisors are experts in the qualitative side; a statistics professor in my department at the university, other friends and colleagues are experts in quantitative methodology and offered help when it was needed.

Participants in this study include policy makers at the Palestinian MoEHE who are considered the "Elites" or "Experts," according to Rossman and Rallis (2003). One of the challenges I faced was to gain access to those elite particpants because of their usual busy schedule. I contacted them as soon as I started my data collection and adjusted my schedule to work with theirs.

2.1 Introduction

The integration of computers and computer technology into Palestinian education was initiated to improve the quality of education in Palestinian schools and create a student-centered learning process that provides the skills, knowledge and experience that are needed in the 21st century (Palestinian MoEHE, 2009). Computer technology has the potential to transform the teaching and learning process from teacher-centered classrooms to rich, interactive, student-centered classrooms and to teach students the knowledge and skills they need for the 21st century (UNESCO, 2002). These two arguments confirm that computer technology can enhance learning and move it toward student-centered direction. This chapter of the literature review will unpack the idea of a student-centered approach to learning and how computer technology can be used to support that idea. This chapter will discuss some of the challenges involved in integrating computers into Palestinian classrooms.

The literature reviewed in this chapter explains some of the issues surrounding computer integration and was used as a guide throughout this research.

2.2 What is Student-Centered Learning?

Cornelius-White and Harbaugh, (2009) define learner-centered instruction as "an approach to teaching and learning that prioritizes facilitative relationships, the uniqueness of every learner and the best evidence on learning processes to promote comprehensive student success through engaged achievement" (Cornelius-White & Harbaugh, p. xxvii). The term "learner-centered" or "student–centered" is used in this dissertation to signify an approach that is different from traditional practices of teaching. Student-centered learning is defined as an approach to education focusing on the interests of the students, rather than those of others involved in the educational process, such as teachers and administrators. Table 2 compares the

terms used to describe student-centered learning with those associated with a more traditional educational approach.

Table 2: Student-Centered Approach Vs. the Traditional Approach

Student-Centered Approaches	*Traditional Approaches*
Person-centered	Curriculum-centered
Self-directed	Teacher-directed
Child-centered	Teacher-centered
Process (how)	Content (what)
Constructing understanding	Covering subject matter
Thinking	Memorizing
Experiential methods	Lecture
Active	Passive
Showing	Telling
Cooperation	Competition or individualism
Inquiry-based	Knowledge-based

Adapted from Cornelius-White & Harbaugh, 2009, p. xxiv

As shown in Table 2, the emphasis in student-centered learning is placed on the student's own inquiry and construction of knowledge, rather than more passive ways of learning.

2.2.1 Theoretical Foundations of Learner-Centered Instruction

Student-centered learning is deeply rooted in several educational theories, especially humanism and constructivism. One of the most important of these theories is the classical humanistic approach that focuses on building a positive teacher-student relationship. The humanistic approach promotes the idea that trusting relationships "foster the formation, process, and completion of self-actualizing and democratic goals, pedagogical flexibility, and the value of helping students discover how to learn more effectively so that 'learning becomes life'" (Cornelius-White & Harbaugh, 2009, p.18).

There are several educational scholars who talked about learning and teaching and still influential today like Dewey and Piaget and Vygotsky. Each scholar advocated a different approach to learning. Dewey "suggested that people learn through authentic experience and reflection. Piaget asserted that people develop through experiencing within their environments" (Cornelius-White & Harbaugh, date, p.20-21). Vygotsky "clarified the meaningful social and linguistic aspects of the environment" (Cornelius-White & Harbaugh, 2009, p.20-21). All of these theories are pivotal to creating an effective student-centered classroom atmosphere. Exploratory and cooperative learning environments and positive teacher-student relationships help create a positive classroom environment and thus support student-centered learning.

One major question suggested by the literature is how can computer technology support the shift from a traditional teacher-focused approach to a student-centered one? If we start to believe that learning should be more focused toward students and those students can learn and can construct their own learning providing different opportunities to learn (Rallis, 1995), then computer technology can help foster learning and help move toward student centered learning.

According to Haaini and Land (1997), computer technology utilizes printed text, graphics, sound effects and animation. It also utilizes various auditory, visual, and tactile modalities and provides options for digital, analog, still or synthesized media. Computers also offer capabilities such as data processing and management that often are unavailable for print or other types of media. So computer technology is more than a "hardware" as Joassen, Howland, Moore, & Marra, 2003 indicated; it consists of design and the environment that engage learners. Computer technology as Jonassen, Peck, & Wilson (1999) pointed is a vehicle for exploring knowledge to support learning by constructing information.

Based on what is said about computer role in fostering learning, the next section tries to define what computer integration is and how computer technology can be integrated into classroom.

2.3 What is Computer Integration?

The rapid technological changes involved in the integration of computers with communication, video, and audio have caused some confusion about the terminology. The term "Computer Technology" has been replaced by "Information and Communication Technology" (ICT) which is used mostly in Europe or "Information Technology" (IT) or "Technology," which is used in North America. Information and communication technology refers to all technologies used for processing information and communicating (Voogt & Knezek, 2008). The public perspective of technology, according to Earle (2002), is as synonymous with computer technology; therefore all the terms used throughout this paper, such as ICT, IT, Technology, refer primarily to computer technology.

Computer Technology Integration occurs when classroom teachers use computers to introduce, reinforce, extend, enrich, assess, and remediate students' mastery of curricular targets (Hamilton, 2007). Integration is not defined by the amount or type of technology used, but by how and why it is used (Earle, 2002). So what does integration of the computer into curricula look like? Is it being able to create a spreadsheet that calculates student grades? Or typing a handout and printing it out for students? Is it having students line up at a computers to complete several levels of drill and practice software programs?

Effective integration, according to National Educational Technology Standards for Students, International Society for Technology in Education (2000), is achieved:

> when students are able to select technology tools to help them obtain information in a
> timely manner, analyze and synthesize the information, and present it professionally. The
> technology should become an integral part of how the classroom functions -- as
> accessible as all other classroom tools. (P.6)

Ertmer (1999) sees technology integration as a way to add "qualitative change" to the curriculum - by accomplishing more authentic and complex goals- more than "quantitative change -or "doing more of the same in less time" (p. 49). According to Ertmer, the most effective method of incorporating technology into education requires a fundamental change in teaching and learning

styles in schools. Table 3compares and sumarizes the diffenrce btween "computer use" and "computer intgeration".

Table 3: Computer Use vs. Computer Integration

Using Computer Technology	Computer Technology Integration
Computer technology usage is random, arbitrary& often an afterthought	Computer technology is planned & purposeful
Computer technology is rare or periodically used in classroom	Computer technology is a routine part of the classroom environment
Computer technology is used purely for the sake of using technology	Computer technology is used to support curricular goals & learning objectives
Computer technology is used to instruct students on content	Computer technology is used to support curricular goals & learning
Computer technology is mostly being used by the instructors	Computer technology is mostly being used by students with content
Focus on simply using technologies	Focus on using technologies to create and develop new thinking processes
More instructional time is spent learning how to use the technology	More instructional time is spent using the technology to learn
Computer technology is used to complete lower-order thinking tasks	Computer technology is used to encourage higher-order thinking
Computer technology is used solely individuals working alone	Technology is used to facilitates collaboration both inside and outside the classroom
Technology is used to facilitate activities that are feasible or easier without technology	Computer Technology is used to facilitate activities that would otherwise be difficult or impossible
Technology is used to deliver information	Technology is used to construct & build knowledge
Technology is peripheral to the learning	Technology is essential to the learning process

adapted from Teachbytes, 2013

In this paper, technology integration is viewed as the use of computing devices (such as desktop computers, laptops, software applications, Internet) and peripheral devices (including printers, scanners, digital cameras, and overhead projectors, and so on) in K-12 schools for

instructional purposes. Accordingly, integration does not mean having students go to a computer lab to learn technical skills while the classroom teacher stays behind to plan or grade papers. Integration is not using specialty software for drills and practice day after day. And integration does not replace a teacher with a computer. Integration is when computer technology is available and accessible at any time and its tools support the curricular goals, ultimately helping students achieve these goals effectively (Edutopia, 2007).

2.3.1 Computer Technology & Curriculum

The literature has defined ways of incorporating computer technology into the curriculum. Jonassen, Peck, and Wilson (1999); Law and Plomp (2003) defined the role of computer technology in the curriculum. They stated that when "learning about ICT", students basically learn technology as a subject in which they learn vocabulary, about hardware components and how to use programming language. "Learning from ICT" is when technology is used as a medium to deliver and communicate messages to students, hoping that students can comprehend and learn from those messages. According to Joassen, Howland, Moore, and Marra (2003), the underlying assumption of this statement is that people learn from technology. They believe that students learn from watching instructional films and television or responding to programmed instruction just the same as the same as they learn from listening to lectures. "Learning through or with ICT" involves full integration of ICT to bring a new educational experience that would be impossible without it (Law & Plomp, 2003).

2.4 Why Integrate Computer into Teaching? Using Past Research and Practice to Develop a Sound Rationale

The integration of computers into teaching has been the subject of debate among educators. Advocates believe that computer technology can improve learning and better prepare students for the 21st century and the workplace, while others complain that billions of dollars have been spent putting technology into public schools. Critics also worry that teachers, already

overburdened with large classrooms and having to teach multiple disciplines, will find it difficult to incorporate computer technology into their instructional practice (Cuban, Kirkpatrick, & Peck, 2001). Because the movement to integrate computer technology into teaching is relatively new, there is little definite research to end this debate between the advocators and debaters (Butzin, 2001). I think the conflict in opinions is due to the fact that the impact of computer technology integration is highly dependent on factors such as how teachers choose to integrate the technology.

There has been considerable research into the impact of computer technology on the education system, but such studies have been done mostly in schools in Western societies such as US. Due to the lack of published research on computer integration in Palestinian schools and surrounding Arab countries, I will mostly use research that was conducted in Western countries for this literature review.

Several studies argue that the use of new technologies in the classroom is essential for providing opportunities for students to learn and operate in the information age. In 1985, the Apple Corporation sponsored Apple Classrooms of Tomorrow (ACOT), a research project that investigated how the routine use of technology by teachers and students affects teaching and learning. Dispelling the widespread distrust and myths about the use of technology in learning that existed at that time, the researchers found that instead of supporting individualized learning and self-expression through writing and drill and practice, computer technology actually encouraged students to collaborate more than in traditional classrooms. Computer technology was more interesting to students as they began using it to create and communicate (Sandholtz, Ringstaff, & Dwyer, 1997).

Other research investigated the impact of computer technology on education which supports ACOTS's findings. Generally speaking, computer technology plays many different roles in the learning and teaching process. These roles include:

1. Improving students' performance and achievement

Several of the studies analyzed in this paper are meta-analyses that explore the impact of computer technology on learning and conclude that technology has tremendous potential to enhance student achievement when it is used appropriately (Kulik, 1994; Coley, Cradler, & Engel, 1997; Butzin, 2001). According to Schacter (1999), "on average, students who used computer-based instruction scored at the 64 percentile on tests of achievement compared to students in the control conditions without computers who scored at the 50th percentile" (Schacter 1999, p. 4). Further, Mann et al. (1999, as cited in Schacter, 1999), found that the "West Virginia's Basic Skills/Computer Education program was more cost effective in improving student achievement than (1) class size reduction from 35 to 20 students, (2) increasing instructional time, and (3) cross age tutoring programs" (p. 6). And as Becta (2002) points out, "differences in attainment associated with the greater use of ICT were clearly present in more than a third of all comparisons made between pupils' expected and actual scores" (p. 4). Finally Balanskat, Blamire, and Kefala (2006) state that the "use of ICT improves attainment levels of school children in English- as a home language- (above all), in science, and in design and technology between ages 7 and 16, particularly in primary schools" (p. 5).

All the above quotes confirm the conclusion that technology has great potential to increase students' achievement, taking into account that those meta-analyses are done in different contexts. In a conclusion, I think in order to enhance student achievement, administrators should focus more on the way teachers are using computer technology in the classroom and the level of access students are getting to that technology.

The Organization for Economic Cooperation and Development (OECD) has also investigated student performance at secondary schools, providing evidence of the impact of ICT

on school achievements. 31countries[1] participated in OECD's Program for International Student Assessment (PISA) in 2003. The OECD conducted an assessment of the educational performance of 15-year-old students. The assessment showed a strong association between students' performance and students' use of and access to computers. Regardless of the place of access, students who used computers regularly performed better in key school subjects compared to students with limited experience with computers, or to students that lacked confidence in their ability to perform basic computer functions (OECD, 2005). According to the OECD (2005), those students with greater access to a computer had more confidence using computer technology and as result had a higher educational performance. However, it should be noted that uncontrolled variables in the students' lives could also be responsible for the poor academic performance. Students who are not familiar with computer technology are more likely to come from lower-socioeconomic backgrounds.

      2.   Engage students by motivation and challenge

Many studies have found that students like to use computers, and they are likely to develop greater self-confidence and a more positive attitude towards learning when they use computers (Schacter, 1999; OECD, 2005; Dunmill & Arslanagic, 2006; Roblyer & Doering, 2009; Balanskat, 2010). Computer technology can improve students' motivation, attitude, and interest in learning. The visual and interactive qualities of computer technology capture students' attention and keep them interested in the lessons. Students are also more motivated to learn complex skills such as writing composition and solving algebraic equations when technological tools help them make corrections to written drafts or doing arithmetic.

Technology can also increase students' motivation to learn when it engages them in production work like word processing, multimedia, and hypermedia. Educators also confirm that

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[1] The countries that participated include: Belgium, Switzerland, Germany, Australia, United States, Korea, Turkey, New Zealand, Austria, Hungary, Denmark, Thailand, Uruguay, Italy, Canada, Japan, Sweden, Czech Republic, Portugal, Ireland, Slovak Republic, Mexico, Poland, Iceland, Finland, Greece, Russian Federation, Tunisia, Latvia, Serbia, United Kingdom

students are much more motivated to write and do their work when they publish it on the web, allowing others from outside the classrooms see their work. Balanskat (2010) pointed out "ICT improved pupils' motivation and attendance. It reduced the gap between the pupils with poorer educational situations and the national average by making them motivated to go to school - with the help of ICT" (p. 14). Further, Dunmill, and Arslanagic (2006) indicated "a large number of studies have found that students are often more engaged and motivated to learn when using relevant ICT to support specific intentional learning" (p. 7). The following quote exemplifies the point of student motivation

> On Monday, when I announced that it was recess, the students wanted to continue to work in the classroom. One said, "you know, I can't believe it's really recess. When you're having a good time, time goes by so fast." They are really involved ……. They work really quietly without a lot of running a round. They seem to be setting up standards for themselves to judge their own work. (ACOT teacher description as cited in Sandholtz, Ringstaff, & Dwyer, 1997, p. 42)

3. Technology can enhance instruction

Another area that is commonly mentioned in the literature is that technology can help students visualize underlying concepts in unfamiliar or abstract topics through using simulation software tools. Technology software such as drill and practice can offer students the interaction and immediate feedback they need to comprehend the information. Using spreadsheets and simulations, software helps students answer "what if" questions and manage their work and learning very easily compared to doing it by hand. Teachers report that students are often more motivated to work cooperatively on hypermedia, database, and website production projects than to work in small-groups without technology (Bransford et al., 1999; Roblyer & Doering, 2009). The new technologies can also help people visualize difficult-to-understand concepts, such as the difference between the terms 'heat' and 'temperature' (Linn et al., 1996). Students can work with visualization and modeling software that is similar to the tools used in non-educational environments, increasing their understanding of academic material and the likelihood of transfer from school to non-school setting (Bransford et al., 1999).

4. Provide tools to increase student productivity

Before computer technology, students spent a lot of time doing repetitive low-level tasks like writing, drawing, and computation (Newhouse, 2002). Now, however, the use of computer technology saves time on production work like word processing and spreadsheets by providing quick and easy corrections to reports, publications, and presentation. Integrated learning systems help teachers quickly assess and track student progress. Also, students use the Internet to do research, collect data, and access information (Bransford et al, 1999), thus allocating time previously spent locating materials to time spent using materials.

As Newhouse (2002) pointed out, "Studies have shown that students often learn more in less time that is their productivity increases, when they use computer support appropriately" (p. 21).

5. Technology can prepare students for the workforce

Technology helps prepare students for the workforce, especially when they learn to use and apply applications used in the working world, such as word processors, spreadsheets, computer-aided drawing, website development programs, and the Internet (De Leon & Borchers, 1998; Cradler, 1994).

All the above findings about the impact of technology on student achievement are encouraging for the Palestinian MoEHE, especially when we consider some of the quality indicators the Ministry is looking to achieve: 1.) Student achievement in the normative tests at the directorate and school level in three main subjects for three grades to be selected annually, and 2.) Student achievement in the national normative tests in Arabic and mathematics for the fourth and tenth grades (MoEHE, 2010 p. 18).

I personally hope to see the effect of increasing students' motivation in Palestinian schools, because from my experience in teaching in elementary and middle schools, I can say that student interest in schools and learning has diminished. At the same time, I don't think teaching

and learning environments in Palestinian schools can provide the proper atmosphere to increase motivation. My thought is also confirmed by the findings of the Palestinian MoEHE. According to the Ministry, teaching and learning methods in Palestinian schools follow a traditional approach and are hardly effective in promoting high-order thinking and the achievement of learning and social competences (2008[2], وزارة التربية والتعليم العالي الفلسطيني).

In conclusion, computer technology can achieve the above mentioned impacts especially when: 1.) Computer technology provides opportunities for students' collaboration and communication inside and outside schools. 2.) Technology application is integrated into the typical instructional day. Computer technology will not improve student achievement if it is used less than every day. 3.) The technology application that is used provides opportunities for students to communicate and collaborate with outside experts. Computer technology can help achieve the above goals if teachers, school communities, and school administrators support the use of the new technology. Students must also be in an environment with easy access to equipment and strong teacher development. The gain achieved by students in the West Virginia Project would not have been possible without such support.

The literature presented above shows the impact that computer technology can have if the teaching and learning environment is designed to support student-centered learning. Therefore, the Palestinian MoEHE should work to develop classroom environments that support the use of computer technology and its integration into learning. The Ministry's ability to achieve this goal will be dependent on the availability of internal resources. A lack of resources in the country could be a challenge to the Ministry and may mean they will have to rely on outside donations to achieve their goal.

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[2]Arabic reference: Palestinian Ministry of education and Higher education, 2008

2.5 Snapshots of How Computer Technology is used in Classrooms

The classroom environment is changing in schools across the world. For example, today 98% of all schools in the United States have computers. Clearly, these statistics demonstrate rising technology access in every classroom (Cadiero- Kaplan, 1999). Because the MoEHE sees Information and Communication Technology as an effective tool to shift the teaching and learning process from a teacher-centered approach to a student-centered approach, this part of the chapter will explore ways of integrating computer technology into classroom fostering the student-centered learning approach.

Classroom research studies have begun to identify sets of practices that have evolved around the use of technology. For example, Means and Olson (1997) conducted case studies of eight individual schools and one network of 462 schools in the United States, all of which used technology to support educational reform. The study included urban and suburban schools in both low- and high-income areas. The technologies that were used ranged from productivity tools and multimedia to email and collaborative knowledge-building environments. The study identified a number of classroom practices associated with the use of technologies. It is important to note here that not all schools were engaged in all these practices. The researchers found that groups of teachers in the target schools used technology to provide students with authentic, challenging tasks, and students worked collaboratively in "heterogeneous groups" on multidisciplinary projects for an extended block of time. The role of the teachers and students changed so that students were more actively involved in determining their own learning tasks, and teachers supported and guided these activities. Assessment techniques changed to some extent as well. Student assessments were likely to be based on the body of the student's work as collected in portfolios. Technology played an important role in supporting these practices by enabling students to search for information, collect and analyze data, produce reports and communicate with others (Means & Olson, 1997; Means & Olson, 1995).

The Second International Technology in Education Study (SITES) was initiated by International Association for the Evaluation of Education Achievement (IEA) to investigate the role of technology in education. The study consisted of three modules: SITES- Module 1 ran from 1997 to 1999 and examined trends in using technology in 26 participating countries. The study included a survey of principals and technology coordinators from a representative sample of schools in each participating country. The most significant goal of the study was to examine the extent to which countries were changing their approach to pedagogy and to look at the contribution that computer technology was making to this change. Two factors were identified in the study: *emerging practices* and *traditionally important practices*. "Emerging practices" are those that describe students as being active and responsible for their own learning, engaged in searching for information. According to the study, a number of schools in many countries are beginning to change classroom practices in ways that were called "emerging practices" (Kozma, 2003).

Building on the results from SITES Module I, SITES Module 2 was conducted from 1999-2003 to explore more about those "emerging practices" and create a paradigm through in-depth case studies of innovative teaching in schools among all school grade levels in different subjects. Twenty-eight countries[3] from Europe, Asia, North America, South America, and Africa participated in the study. SITES Module 2 provided teachers all over the world with outstanding examples of how technology can change classroom teaching and provided policy makers with guidelines on how to increase the positive impact of technology in their education systems. The twenty-eight participating countries applied a common set of international criteria to select innovative cases from among their schools. The innovation of these cases was defined locally, yet

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[3]The countries are: Australia, Belgium, Bulgaria, Canada, Chile, China Hong Kong, Chinese Taipei, Cyprus, Czech Rep, Denmark, England, Finland, France, Germany, Hungary, Iceland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, The Netherlands, New Zealand, Norway, Philippines, Portugal, Russian, Singapore, Slovak Rep, Slovenia, South Africa, Spain, Thailand, United States

there were many commonalities across cases and countries. Generally, the countries picked cases in which teachers changed their own role to become advisors and guides, while students were more actively engaged in what are called "constructivist activities". Examples of active engagement included searching for information, designing products, and publishing or presenting the results of their work. Based in the detailed analysis of 47 of the 174 case reports, seven patterns of innovative pedagogical practices emerged from the cluster analysis. These patterns are summarized below; they can be found in more details in Kozma (2003, pp. 52-70).

- *Tool Use Cluster:* The rationale behind choosing this cluster is its emphasis on the extensive use of different technologies and its lack of emphasis on specific teacher practices. All the cases in this cluster used email and productivity tools such as word processors, spreadsheets, and presentation software. Web resources and multimedia were also heavily used.

- *Students Collaboratively Research Cluster- Found in All Cases-:* Students were primarily working in pairs or groups with other classmates to primarily perform research projects (86% of the cases) and occasionally analyze data (36%).

- *Information Management Cluster:* This refers to teacher-student activities that involve searching for, creating, managing, organizing, and using information for teaching and learning. Teachers played an important role in this cluster in structuring students' activities and materials (in 91% of the cases), providing advice (in 95% of the cases), and monitoring and assessing students' work. ICT was used to assess students when, for example, teachers provided online feedback on students' posted work (in 86% of all cases).

- *Teacher Collaboration Cluster:* In this cluster, teachers collaborated with students (in all the cases) and with their colleagues (in 95% 0f the cases).

- ***Outside Communication Cluster:*** This cluster was characterized by students' work with others outside the classroom (in 56% of the cases) through the use of email, the Internet, or conferencing software.

- ***Product Creation Cluster:*** Students and teachers were involved in designing or creating products or presentations like web pages or electronic newspapers by using software packages (in 86% of all cases).

- ***Tutorial Cluster:*** Students used software packages like drill and practice software to support instruction. Students worked individually and received feedback on their performances.

It is important to note here that, while these commonalities between countries are the main finding of the study, at the same time those commonalities do not represent the typical or majority of educational practices in the countries. Those patterns of practices can be a model for me and other teachers on how to use computers in the classroom, because those practices represent the common global vision of how computer technology should be used.

Table 4: Patterns in Students', Teachers', and ICT Practices

Clusters	ICT Used	ICT Practices	Students Practices	Teacher Practices
Tool Use	Web resources, multimedia, email productivity tools	Search for information, communicate, create products	Collaborate with other students, search for information, create products	
Student Collaborative Research	Web resources, productivity tools, laptops, LANs, email, web design tools, multimedia	Communicate, search for information, create products, collaborate, simulate research	Search for information, solve problems, conduct research, analyze data, collaborate with others	Design materials, lecture, advise, create structure monitor
Information Managements	Email, multimedia, web resources, productivity tools, course management tools	Communicate, search for information, create products, monitor plan	Conduct research, create product, collaborate with others, Search for information, solve problems, publish results, self-assess	Advise, monitor, collaborate with other colleagues, create structure, design materials
Teacher collaboration	Email, productivity tools, multimedia, simulation	Communicate, search for information, create products	Search for information, publish results, create products, collaborate with others, collaborate outside, pick you own task	Advise, create structure, design materials, monitor, collaborate with students, collaborate with other colleagues, collaborate with outside actors
Outside Communication	Web resources, productivity tools, email, collaborative environments	Search for information, communication	Conduct research, search for information, publish results, create products, collaborate with other, collaborate with outsiders	Advise, create structure, monitor, collaborate with colleagues
Product Creation	Web resources, productivity, tools, multimedia,	Search for information, create products	Search for information, collaborate with others, publish results	Advise, create structure
Tutorial	Tutorial	Tutor	Drill and practice	Design materials, collaborate with colleagues

Adapted from Kozma, 2003 p.51

25

SITES 2006 examined 22 education systems from 20 countries[4] to look at what pedagogical practices teachers apply and how ICT factors into these practices. This exploration was conducted by administering three questionnaires to schools principals, technology coordinators, and to Mathematics and Science teachers (Anderson & Plomp, 2009). The general impression that emerged from the results of these questionnaires was consistent with the findings of SITES-M1 and SITES-M2: namely. Box 1 provides examples of the most satisfying pedagogical practices according to participating teachers.

Box 1: Examples of Satisfying Pedagogical Practices in mathematics and Science from Participating Countries

Students had to do a price comparison of different floor coverings for their bedrooms. They were to provide a scale drawing, a spreadsheet comparison and a graph comparison of cost.

Mathematics, Alberta, Canada

Teaching the relative position of two circles or the relative position of a circle and a line by means of the "Cabri geometry" program. This program is easy to use and provides high visualization for better understanding and mastering of a topic.

Mathematics, Slovak Republic

This study was about using ICT in teaching and learning about the digestive system. Students had to study diseases in the digestive system. They searched a variety of resources and did a survey among people in the community. They presented their finding via a website and produced a leaflet using PowerPoint.

Science, Thailand

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[4] The countries are: Alberta Province- Canada, Catalonia- Spain, Chile, Chinese Taipei, Denmark, Estonia, Finland, France, Hong Kong SAR, Israel, Italy, Japan, Lithuania, Moscow- Russian Federation, Norway, Ontario Province- Canada, Russian Federation, Singapore, Slovak Republic, Slovenia, South Africa, Thailand

A research project on climate change was carried out as a synthesis of the themes concerning atmosphere, hydrosphere, and the plant Earth. Students were organized in cooperative work groups to search and use Internet data. Word- processing and multimedia materials had been used.

Science, Catalonia, Spain

Source: VOOGT, 2008 pp. 227-228

I have located one study that was conducted in Palestinian schools by Wahbeh (2006) which administered a questionaire to explore the use of Internet among students and teachers. The study revealed that teachers and students used the Internet in education primarily for gathering information. Students used it to gather information related to their school research and reports and for homework; teachers used it to gather information to prepare lessons related to the curriculum. However, it is important to note here that those activites were mostly conducted outside the schools, either at home, in Internet Cafes, or in clubs.The teachers rarely used computers in the targeted schools in general; if they were used in teaching, the teachers concentrated on low-level skills such as how to use office software. The most common use of computers in the schools was during the technology lessons (i.e., 45 minutes per week). Among the 132 teachers who answered the teacher questionnaire, only 26 percent of them used a computer at their schools.

After reviewing the practices presented above, I have two points I would like to raise here: first, those practices did not originate in one night; it took years for teachers to reach that level of computer integration. For example, the ACOT project lasted ten years and according to Sandholtz et al (1997) "during the first few years, the addition of technology did not revolutionize classroom instruction" (p. 9).

The second point that I would like to raise is computer technology in itself will not change and improve education; what matters is how it is used. Therefore meaningful use of computer technology in classrooms goes far beyond just dropping computers into the classrooms. The examples above show that innovation and best practices came from changing teachers'

pedagogy and moving from the traditional paradigm to a more student-centered approach. Computer technology encouraged students to be more productive, collaborative, and communicative with students and others.

2.6 Stages in Technology Integration

Technology cannot be integrated into classrooms overnight. It can take years to complete the process. A number of researchers have documented teachers' methods of adopting technological innovations in the classroom (Barron, Kemker, Harmes & Kalaydjian, 2003; Cennamo *et al.*, 2009; Toledo, 2005; Dias, 1999). This section of the literature will be helpful in recognizing the level of computer integration among Palestinian teachers.

Researchers from Apple Classrooms of Tomorrow (ACOT) proposed one of the most commonly-used developmental instructional evolution stages (Cennamo et al, 2009). Between 1985-1998, the Apple Company collaborated with public schools, universities, and research agencies to investigate teachers' attitudes, practices, and behaviors with regard to the integration of technology (Dwyer, Ringstaff, & Sandholtz, 1991). The study found that changes involving technologies are evolutionary, in that teachers proceed from one phase to another as they develop their familiarity with computer skills (Dwyer et al, 1991; Sandholtz, Ringstaff, & Dwyer, 1997). The report of this project identified five stages of technology integration in classrooms. Those stages are found in Sandholtz, Ringstaff, & Dwyer (1997, pp. 37-47):

▪ Entry: Teachers had little or no experience with computer technology and demonstrated little preference to significantly change their instruction. Experienced teachers found themselves facing problems typical of first-year teachers: discipline, resource management, and personal frustration that comes from making time-consuming mistakes. One of the teacher commented:

> Time is always going to be a problem. Teachers need help just to get equipment up and running sometimes. I do not seem to have enough time to meet the needs of everyone. I keep up by going in on weekends to complete the technical work. (Sandholtz et al., 1997, p. 38)

28

- Adoption: After a few months, once teachers had mastered the technology-related skills and the computer equipment was installed in the classrooms, teachers moved into the adoption stage, and their concerns began to shift from connecting the computers to integrating them into their daily instructional plans. Teachers adopted the new electronic technology to support already established traditional whole group lectures, recitation, and to teach students how to use technology like keyboarding instruction. The ACOT team witnessed also in this stage that teachers adopted the new electronic technology to support established text-based drill-and-practice instruction.

- Adaptation: In this phase, the computer technology became thoroughly integrated into traditional classroom practice. Lecture and recitation remained the dominant form of student tasks, but students used word processors, databases, some graphic programs, and many computer-assisted-instructional packages for approximately 30-40% of the school day. Productivity emerged as a major theme in this phase. Teachers reported that their students produced more and at faster rate in both elementary and high school.

- Appropriation: As teachers eventually reached the Appropriation phase, they came to more fully understand technology, try it out, and make it central to daily classroom life; their roles begin to shift noticeably. In this phase, little change was made in classroom practice, but more in teachers' attitude toward computer technology. It is best described in the words of ACOT teacher:

> Last spring, when I was taking a course at the university, I borrowed a computer and I did my whole term paper on it. I could not believe how labor saving it was, and now I believe, like many other teachers who have discovered the same thing, that it would be hard to live without a computer. If you had to take the computer I have at home, I would have to go out and buy one. I would have to have a computer. It has become a way of life (Sandholtz, Ringstaff, & Dwyer, 1997, p. 43).

This step was important for teachers, because people normally develop good beliefs about certain things before moving to use them in more imaginative ways. Therefore, that step

29

was a critical point for ACOT teachers before they started using computer technology in an

imaginative way in their teaching (Sandholtz et al, 1997).

- Invention: Teachers were more disposed to view learning as an active, creative, and

socially interactive process than they were when they entered the program. Students had a choice

of presentation methods: digital slide shows, skits, and so on (Sandholtz et al., 1997). The

following quote encapsulates this point:

> I was so excited after the first day, I thought it was too good to be true. The students were
> using page layout software to make a publication in 1 40- minute class period using the
> network.... All students saved and quit within three minutes before the bell. It runs like a
> charm ... Now we can simulate a newspaper company. Eventually, students will work in
> groups, each with their own task, some for art, business graphs, articles, and the editing
> group. Students can place finished work on a public share disk for the editing group to
> retrieve and complete the publication. (Sandholtz et al., 1997, p. 44)

Table 5: Stages in Technology Integration

Stage	Characteristics
Entry	Teachers have little or no experience in using computers; teachers have doubts about computer integration.
Adoption	Teachers use computer technology to support traditional text-based drills and practices.
Adaptation	Teachers thoroughly integrate computer technology into traditional classroom practices; learner productivity is increased.
Appropriation	Teachers start to change their beliefs and realize the importance of computer integration.
Invention	Teachers are ready to use computer technology actively in everyday teaching, increasing teachers' tendency to think about whether technology is responsible for the changes in students' academic performance.

Source: Sandholtz et al.(1997)

The invention stage is the climax in the evolution. Most, but not all, ACOT teachers

reached this phase, as they demonstrated their comfort with a new set of beliefs about teaching

and learning that was not common before or even during the ACOT project. The ACOT teachers

began to view learning as an active, creative, and socially interactive process. Knowledge was

viewed as something students must construct themselves and could not be transferred in one

piece. One important thing that the ACOT team pointed out was that reaching the invention stage was slow and tough (Sandholtz et al., 1997).

Reading the ACOT study increases curiosity and eagerness to know more about the environment that was provided and supports teachers to reach that level of beliefs and integration of computer technology. According to Sandholtz et al. (1997), two things are essential to help teachers reach that level of technology integration. First, teachers need to confront their beliefs about learning and teaching and the efficacy of different instruction during the training process. This was done gradually as the teachers moved from one stage to the next. It started by using technological resources for classroom management in the entry stage to increase students' productivity in the adaptation stage. Once teachers reached the appropriation and invention stages, they came to understand the potential of technology to enhance instruction, and their teaching practices were changed. This also was supported by Ertmer (2005) when she reported that teachers' beliefs can be changed through "personal experiences" thus highlighting the importance of building teachers' confidence through experience with small instructional changes before attempting larger change.

The second essential thing is to provide support for technology in different levels. According to Sandholt et al. (1997), the effective use of technology is not just adding computers to classrooms; teachers also need support from administrators and districts. Without that support, getting hardware and software could be a poor investment. So to ensure that computers are effectively integrated into instruction, support must be provided to teachers from different levels: administrators and community members.

This first section of the literature review chapter has looked at student-centered learning method from both theoretical and technological lenses, then explored the impact of computer integration into learning and under what circumstances those impacts can be achieved. The next section of the literature review section investigates the challenges that the MoEHE in Palestine

will face as they try to integrate computer technology into learning, and what suggestions the literature has about ways to overcome those challenges.

2.7 Challenges for Effective Computer Integration into Instruction

Although research findings showed earlier that the use of computer technology can help enhance student learning, other studies have shown that teachers use computers several times a week for preparation but only once or twice a year for instructional purposes (Groff & Mouza, 2008). This can be a barrier to technology integration because teachers are more reluctant or hesitant to fully incorporate the use of technology into their lessons. According to Bingimlas (2009), barriers are conditions that make it difficult to make progress or to achieve an objective. The literature documents several barriers and challenges that impede computer integration into instruction; identifying those challenges upfront is the first step toward overcoming those barriers and empowering computer integration.

This section begins by highlighting some challenges and barriers that confront computer integration into teaching and learning, and then describes some strategies that can help overcome the barriers mentioned in the literature. While this section will not be an extensive list of challenges and strategies, it highlights complexities in computer integration into teaching and learning. Since computer integration into Palestinian schools is in the "emerging stage", recognizing these strategies will help the Palestinian MoEHE to overcome some of the challenges that they may face.

To examine the barriers and strategies, I looked at empirical, analytic studies in the US and other countries that focus on general barriers that affect the use of computers in K-12 schools for instructional purposes. In the Palestinian context, I only found Wahebeh's (2006) study; I will refer to it throughout this section. There are a number of older studies that are referred to in this section that were mostly undertaken in U.S. The U.S. is already in the process of integrating computer technology into education for many years, and many studies were undertaken early on and were referred to in many other studies.

The literature identified both barriers to the integration of computer technology and strategies for integrating it successfully. Barriers included a lack of equipment, training and time (e.g. Quality Education Data & Malarkey- Taylor Associates, INC, 1995; Office of Technology Assessment, U.S. C., 1995; Cuban, Kirkpatrick, & Peck, 2001), as well as teachers' preferred instructional methods and their beliefs about teaching and learning (Becker, 2000; Alwani & Soomro, 2010; Hermans, van Braak, & Valcke, 2008).

Several authors arranged those factors into groups. Ertmer (1999) categorized barriers to learning or using computer technology into extrinsic, or first-order barriers, and intrinsic, or second-order barriers. First-order barriers include problems with access, software, planning, or technical support, while second-order barriers include teachers' beliefs about teaching or technology, the organizational culture, instructional models, and a lack of openness to change. For the purposes of this paper, I grouped those challenges into school factors which include school administration, school culture, and physical structure. Teachers' factors include 1.) Lack of confidence 2.) Technology skills and proficiency 3.) Teachers' attitudes and beliefs. I was inspired by Zhao et al.'s (2002) classification. In addition to the above mentioned factors, I included social acceptance which was under-studied in the literature, but was found to be a barrier in the Palestinian context.

2.7.1 School Factors

2.7.1.1 School Environment and Administration

Nobody can deny the role of school administration in technology integration; an earlier section of this literature review chapter examined how school administrators' support helped teachers in ACOT to achieve successful computer integration in schools. Their support includes providing time for teachers to be trained, changing schools' schedule to fit well with training sessions, showing interest in what teachers are learning, among other things. Other studies echoed what was found in the ACOT project and show that for computers to be integrated fully, school

administrative support is essential (Su, 2009; Alwani & Soomro, 2010; Cuban, 2001; Office of Technology Assessment, U.S. C., 1995).

Barriers to technology integration that were mentioned in the research may include leadership, school timetabling structure, and school or institutional culture. Researchers have shown that school administrators can sometimes hinder computer integration by teachers. Fox and Henri (2005) found that the majority of Hong Kong school principals did not understand the Ministry's vision and goals for computer integration and therefore teachers' activities in regards to computer were very limited.

An inflexible timetable can also act as a hindrance to the integration of computer technology (Albirini, 2004; Becker, 2000). In a survey of more than 4000 teachers in over 1100 schools in the United States, Becker (2000) found that scheduling is one of the biggest challenges for computer integration. Most secondary students in that study had continuous blocks of less than an hour for any class. Structure and organization of class time also have a role in computer integration. Specifically, Cuban, Kirkpatrick, & Peck (2001) pointed out that many teachers complained that having to teach six periods a day made it difficult for them to incorporate computer technology into their classrooms. Teachers said that they would need hours to preview websites and asked, where would the additional time come from? This finding was also seen in Qablan, Abuloum, and Abu Al-Ruz's (2009) study in the Jordanian context: teachers and school principals in their study commented that "the inflexible time-table, year-end- examination and conflicted classes negated teachers' potentials of utilizing computers" (p. 296).

A lack of time is also mentioned as one of the top barriers in Alwani and Soomro's (2010) study. The study examined the barriers to use information technology in science education in the Yanbu school district in Saudi Arabia. The researchers conducted a survey of 80 male and female science teachers to explore their access to, and use of, computer technology. They found that teachers and students had a limited number of hours during the day to work on computer integration. This was also found in other studies, for example British Educational

Communications and Technology Agency (Becta) in 2004 and Williams, Coles, Wilson, Richardson, Amanda, & Tuson, in 2000, among others.

Palestinian schools will most likely not be any different from the schools mentioned above. From my experience, I can say that teachers in Palestine have on average five blocks of classes with 45 minutes each daily. Computers in Palestinian schools are located only in computer labs and this would leave no time for teachers to plan and coordinate with the principal or technology subject to reserve the computer lab. Besides having a 45 minutes class period will be very hard for teachers to send students to the computer lab and using the left time for teaching lessons, taking into consideration the unforeseen hardware and software problems that might occur in the middle of the lesson.

2.7.1.2 School or Institutional Culture

School culture includes school administration and assessments. School administration refers to school principals' support in integrating computer technology through providing adequate access to resources and being responsive to teachers' needs. Assessment, another part of institutional culture,is the act of measuring student learning and it can be summative or formative. According to Bloom, Hastings, and Madaus (1971), summative assessment is used to judge what the learner has achieved or learned at the end of a course or program, while formative assessment is used to provide feedback in the process of teaching and learning, for the purpose of improving the learning. Summative assessment is the more common form of assessment that occurs in schools in the form of end-of-the-year examinations which have serious consequences for the student's promotion or graduation (Hew & Brush, 2007; Qablan, Abuloum, & Abu Al-Ruz, 2009; Quality Education Data & Malarkey-Taylor Associates, INC, 1995). The pressure of such testing may be a major barrier to technology integration. For example, Fox and Henri (2005) found that the pressure of testing gave teachers little time to try out new way of working related to computers. This view aligns with a finding from Qablan, Abuloum, & Abu Al-Ruz (2009): most of the Jordanian teachers in their study did not utilize computers in teaching higher-level

classes as these classes are required to go through board examination at the end of the school year.

Corroborating these findings, in the 1998 national survey of teachers Teaching, Learning and Computing (TLC), Becker (2000) found that the pressure of curriculum coverage makes teachers hestitant to try new things. Many teachers felt pressured by administrator expectations for content coverage, especially content to be covered on high- stakes test.

The findings from these studies correspond with one to another, suggesting that the pressure of curriculum coverage and traditional testing are common problems in different education systems.

Wahbeh conducted a study in 2006 about the gap between information-rich and information-poor (digital divide) in Palestinian education system. He used a case study approach including site visits, classroom observations, focus groups, and interviews with teachers, students, parents, and stakeholders. The study showed that a lack of time, a condensed teaching schedule (like 26 classes per week), and crowded curriculum prevented teachers from using computer technology in their classrooms. In addition to that, the educational system in Palestine, according to the MoEHE (2008), follows a traditional approach which hardly promotes high-order skills and problem-solving skills. Wahbah (2006) also indicated that teachers rely on the national curriculum in teaching, and the national curriculum is based on the assumption that teaching subjects, including technology, should start from scratch regardless of the skills the students may already have acquired.

Wahbah's (2006) findings show that the Palestinian educational system is structured to follow the traditional approach. This means the education system depends on summative assessments, and teachers are restricted to using the textbooks that are appointed by the officials. To ensure the positive effects of computer technology that were mentioned in Chapter 1, the Palestinian MoEHE has to reform the curriculum to support the success of technology in the classroom.

2.7.1.3 Physical Structure

Hew and Brush (2007) and Qablan, Abuloum, and Abu Al-Ruz, (2009) pointed out that, even in cases where computers are available, teachers don't use them as they should because computers are housed in labs and teachers don't have an easy access to them. The use of these labs is also usually reserved for computer classes. According to Zhao, Pugh, Sheldon, and Byers (2002), there are major differences between having access to computers and having easy access to them. For example, when computers are housed in labs, teachers might not have easy access to those computers, especially if teachers need to schedule lab time in advance.

The case is the same in Palestinian schools. According to Wahbeh (2006), all computers in Palestinian schools are housed in a computer lab, which is the responsibility of the technology subject tutor. The labs are primarily used by technology subject tutors who use the lab to teach students classes that are 45 minutes long on average.

The above section explained some of the school factors that are found in the literature and considered challenges for computer technology integration into instruction. Those factors are summarized as scheduling, intense content, assessment, and administrators' support. The next section discusses resources that are considered important for the integration of computer technology into classrooms, specifically as the cost of technology is high and the demand for updating is increasing too.

2.7.2 Resources

The cost of educational technology is very high, and the difficulty in finding funding for technology in the classroom makes it difficult for schools to build an adequate infrastructure with internet access, sufficient number of hardware and software, and electrical wiring. Many of researchers, including Alwani and Soomro (2010), Groff and Mouza (2008), Zhao, Pugh, Sheldon, and Byers (2002), Plomp and Akker (1988), and Toprakci (2006), discussed this challenge. For example, in a survey administered to 1564 teachers and principals in 214 Turkish

schools, Toprakci (2006) found that insufficient budget allocated to technology was considered the main obstacle to technology integration in the Turkish context.

One of the biggest challenges to the modernization of Palestinian schools is the lack of resources due to the country's prolonged political conflict due to the occupation. Palestinians depend on international donors for most of their projects. Studies have shown that Palestinian schools lack technology resources like hardware and Internet connectivity in most schools. According to the Directorate General of Educational Technology and Information as cited in Wahbeh, (2006), only 21 Palestinian schools have their computer labs connected to the Internet.

Based on interviews with stakeholders and administrators in the MoEHE, Wahbeh (2006) indicated that in order for a school to connect its computer lab to the Internet, it should seek donations from the local community or the parents' associations (PTAs). In addition, the connection should be registered under the funder's name as an attempt to enhance the involvement of the local community in the educational process. On the other hand, Wahbeh's interviews with officials in the United Nation Relief and Work Agency (UNRWA) – the agency responsible for the Palestinian schools in the refugee camps, which is 25% of Palestinian schools, revealed that the UNRWA headquarters does not allow its computer lab to be connected to the Internet for financial reasons. Informal conversations with several educators revealed that the situation is still persisting. The issue of the Internet that was found in Wahaeh's study remains the same as the findings of this study, as I will show later on in the findings chapter.

This policy makes it very hard on teachers to have an environment that will support them to use computer technology effectively. Having access to computers without internet means that students are not receiving the full benefits of technology in the classroom; it also does not support the student-centered perspective in classroom teaching. Furthermore, this situation reinforces the digital divide between schools. Hargittai (2003, as cited in Wahbeh, 2006) referred to a digital divide between schools in terms of access to computer technology; for example, students at

governmental schools with Internet connections enjoy the privileges associated with that access, and the quality of their education will not be the same as those without Internet connection.

Technology resources are also identified as another barrier that goes under resources barriers to computer integration. It includes lack of technology and technical support. Lack of technology includes an insufficient supply of computers, peripherals, software, and Internet connections (Hew & Brush, 2007). Inadequate hardware and software make it hard for teachers to integrate technology into teaching (Pelgrum, 2001; Sandholtz, Ringstaff, & Dwyer, 1997; Alwani & Soomro, 2010; Toprakci, 2006; Williamset at al, 2000). Pelgrum (2001) showed the results of a worldwide survey of the obstacles to the integration of ICT in education according to educators at the primary and lower secondary level. These results were derived from samples of schools in 26 different countries. Among the most common obstacles was lack of computers. In Ertmer (1999), a second-grade teacher revealed: "I don't use it (the computer) because I have a really hard time accessing it, finding a way to organize it with 23 students and one computer. We just don't do very much." (p.50).

Technical faults with ICT equipment are likely to lead to lower levels of ICT use by teachers. In the British Educational Communications and Technology Agency's (BECTA) review of the literature in 2004, they found a relationship between a lack of technical support and teachers' use of computer technology. Recurring faults and the expectation of faults occurring during teaching sessions were likely to reduce teachers' confidence in technology and cause teachers to avoid using the technology in the future. Therefore, to ensure that computer integration into classrooms is successful, teachers need adequate technical support to assist them in using different technologies (Cuban et al, 2001; Toprakci, 2006; Mumtaz, 2000).

2.7.2.1 Lack of Training

The literature also confirms that a lack of training in the use of technology is one of the major barriers for computer technology integration in schools (Becker, 2000; Pelgrum, 2001; Quality Education Data & Malarkey-Taylor Associates, INC, 1995; Office of Technology

Assessment, U.S. C., 1995; Cuban, 2001; British Educational Communication and Technology Agency (Becta), 2003; British Educational Communications and Technology Agency (Becta), 2004; Toprakci, 2006). In many cases, according to Sandholtz, (2001), the focus has been on acquiring hardware and software rather than preparing teachers to use technology. This leaves teacher unprepared to use computer technology in their teaching and decreases the chances for successful computer integration.

Even when training is offered, most of the time it is in the form of a "one-shot workshops" (Woodbridge, 2004) that is not offered at a convenient time (Becta, 2004). Additionally, the content of the training mostly emphasizes computer literacy and operation rather than preparing teachers to use computer as a teaching tool (Sandholtz, 2001). According to Cuban, Kirkpatrick, and Peck (2001), despite the many opportunities and on-site sessions offered to learn general computer skills, the generic training available was irrelevant to teachers' actual, specific needs.

The above section shows that computer integration into education is very expensive, making it challenging for schools to provide access to technology. Technology integration requires sufficient funds for the purchase of hardware, software, and also keeping up technology updates, in addition to providing technical support. That was apparent in (Alwani & Soomro, 2010; Groff & Mouza, 2008; Zhao, Pugh, Sheldon, & Byers, 2002; Plomp & Akker, 1988; Toprakci, 2006) findings. I think this factor makes it harder on the Palestinian MoEHE to introduce more technology in classrooms, especially because Palestinian schools lack resources and depend on outside donors to run projects. The above section shows also that "one-shot workshops" will not help teachers acquire the skills that are needed for effective technology use in classrooms.

As the pervious section covered some of the challenges that relate to school factors, the next section will talk more about challenges that relate to teachers' factors which includes lack of confidence, computer technology skills and proficiency, and teachers' beliefs sand attitudes.

40

2.7.3 The Teacher

  This section explores the role of teachers in the successful integration of technology into primary and secondary education.

  For instance, what knowledge and skills are required for teachers to integrate computer technology in their classrooms? Do teachers need to change some of their practices or beliefs to assure effective technology integration?

2.7.3.1 Lack of Confidence

  Teachers' lack of confidence in using computers is considered one of the major barriers to computer integration (Balanskat, Blamire, & Kefala, 2006; Cox, Preston, & Cox, 1999; BECTA, 2004). According to BECTA's (2004) report, teachers who are not skilled in the use of computer technology have anxiety about using it in front of students who may know how to use it better than they do. Lack of confidence was common for teachers and practitioners in BECTA's (2004) study; many of these educators focused on the fear of admitting to their pupils that they have limited knowledge about the use of computer technology. Cox, Preston, and Cox (1999) found teachers who are regular users of computer technology tend to be more confident and have more positive attitudes about the use of computers in the classroom.

2.7.3.2 Technology Skills and Proficiency

  Although Cuban et al. (2001) found that teachers' knowledge about technology was not a factor in encouraging teachers to use computers in the classroom, other researchers found that teacher's ability to use a computer does in fact have an effect on how technology is used in the classroom (Zhao, Pugh, Sheldon, & Byers, 2002; Becker, 2000; Alwani & Soomro, 2010; Williams, Coles, Wilson, Richardson, Amanda, & Tuson, 2000; Quality Education Data & Malarkey- Taylor Associates, INC, 1995; Becta, 2004; Albirini, 2004). For example, in a study of Scottish schools, Williams et al (2000) found that a lack of skills in the use of databases and spreadsheets was seen as an inhibiting factor by more than 10% of elementary school teachers.

According to Hew and Brush (2007), teachers need to obtain basic technology skills before they can move towards adopting student-centered and constructivist practices with technology.

The lack of technology-related classroom management knowledge and skills is another barrier to technology integration into the curriculum. Teachers need basic skills and confidence in using technology, but they also need help integrating technology into their curriculum and instructional strategies. Some researchers suggest that teachers not only need new forms of professional development but also a change in attitude that would encourage them to be less fearful of technology and more willing to take risks (Sandholtz, 2001). Teachers need to be equipped with technology-related classroom management skills. Skills such as knowing how to organize the class effectively so that students have equal opportunities to use computers, or what to do if students run into technical problems when working on computers, can have a great effect on successful technology integration in schools (Williams, Coles, Wilson, Richardson, Amanda, & Tuson, 2000).

In summary, teachers need to have basic skills in operating and navigating computer technology to be confident in using it, as well as the skills to apply technology in the curriculum and use it for instruction.

2.7.3.3 Teachers' Attitudes and Beliefs

Teachers' attitudes and beliefs are discussed as a secondary barrier to the integration of computer technology into education. Secondary barriers are thought to be more difficult to overcome because they are less tangible and are embedded in teachers' thoughts and beliefs (Ertmer, 1999). According to Ertmer (2005), the way computers are integrated into classrooms depends on the teachers themselves and the beliefs they hold toward computers. For example, teachers who viewed the computer as "a way to keep kids busy" did not see the relevance of using computers in the curriculum; computer time for those teachers was offered as a reward once work was completed (Hew & Brush, 2007). Similarly William et al (2000) found that 10% or more of teachers consider the use of computer resources such as email, video conferencing,

spreadsheets in school as inappropriate. This was the main reason teachers gave for not using these technologies. In a study conducted in Australia about students' and teachers' perception toward the use of portable computers at secondary school, Newhouse (2001) found that teachers' beliefs are a major barrier to technology integration. Teachers in the study did not believe that computers could lead to better understanding. The computer was mainly used individually to complete tasks.

As we see from the above examples, there is some correlation between levels of computer use and teachers' attitudes toward computers; teachers who believe that computers can positively benefit them and their students tend to use computer more often into their teaching (Williams, Coles, Wilson, Richardson, Amanda, & Tuson, 2000). There is also a strong relationship between teachers' philosophies of teaching and effective computer integration. Effective teaching and learning with technology requires a radical shift in the teaching process, moving towards more constructivist pedagogy and student- centered approaches. This new shift requires changes in the roles of both teachers and students and in classroom organization and assessment procedures (Becker, 2000; Ertmer, 2005; Woodbridge, 2004). According to Groff and Mouza, (2008), teachers often feel hesitant about computer integration because it sometimes opposes their pedagogical beliefs and forces them outside of their established role as teachers.

Effective computer integration complements a student-centered model of teaching, and this often conflicts with the traditional model that is found in schools. As a result, teachers who use technology in the classroom may experience a paradigm shift in the teaching and learning process.

2.7.4 Social Acceptance

Social acceptance is understudied in the literature, but is important in the Palestinian context. The various focus groups that Wahbeh (2006) included in his study revealed that most parents worry about children using computer technology in schools, especially the Internet, and

believe children must reach a certain age they can use the Internet. Box 2 shows some examples of those worries.

Box 2: Examples of Palestinian Parents' Worries about Computer Technology

"My father won't let me use the Internet because he thinks it contains dirty things. They don't know that it is useful and we do our homework from it." P. 29 Mohannad, Grade 9
"One of the obstacles that I face is that my parents are afraid that we might chat with guys. That's why the Internet is not good for them" P. 18 Nisreen, Grade 9."
"I do not encourage my kids to go to the Internet centers, I'm against the use of the Internet, this generation is bad and I'm afraid that my kids will do bad things" P.18 Nafez, father of one student

Source: Wahbeh ,2006

I think the concerns and worries of parents found in Wahbeh's (2006) study are not unique to Palestinian schools. I think these same concerns can be found in surrounding Arab countries. However, I also believe that Palestinians value education greatly. I believe that if the Palestinian MoEHE has clear goals and rationale for integrating computer technology in education, the community will understand that and will come to accept it, perhaps even support it.

There are number of barriers that were identified in the previous section that prevent teachers from integrating computer technology regularly into their teaching. Without time to learn new technology and prepare instruction that integrates technology into teaching, teachers are less likely to use technology. A lack of access to current and functional technology and support when using technology has been found to severely reduce teachers' ability to integrate technology into lessons.

Teachers need also to acquire skills for basic use of technology in addition to skills of how to incorporate technology into their teaching. The lack of these skills is considered to be a barrier for teachers to use computers in teaching. Beliefs are one of the indicators for teachers' use of technology for teaching. When pedagogical beliefs are aligned with the use of technology, teachers are more likely to integrate that technology into their teaching. The next section looks at the strategies that can be used to overcome some of the challenges to the integration of computer technology.

2.8 Strategies to Overcome Barriers

Identifying and examining the barriers to computer technology integration alone will not help to overcome them. More research is needed on how to overcome these barriers so we can plan for effective integration of computer technology into classrooms (Lim & Khine, 2006). Based on the literature, there are several types of barriers that hinder effective computer integration, and sometimes two or more barriers may appear at different points in the integration process. The literature also recognizes different strategies that can be used to overcome some of the challenges.

This section provides a snapshot of some of the possible strategies that are recognized in the literature. Although these strategies are mentioned in contexts other than Palestine, they can still provide ideas on dealing with some barriers. In order to provide a coherent description of various strategies to overcome barriers, I classified them into distinct categories.

2.8.1 Having a shared vision of computer integration

One of the most important steps to achieving meaningful computer technology use in schools is the development of a vision of how to use technology to achieve educational goals. According to Ertmer 1999:

> a vision gives a place to start, a goal to reach for, as well a guidepost along the way […] a shared vision offers a vehicle for coherent communication among all stakeholder (teacher, parents, students, administrators, community leaders, business partners). Thus, when new issues, problems or opportunities arise, our vision keeps us focused on what is central to our technology efforts. (p.54)

45

Lim and Khine (2006) did a study to examine the strategies employed by four Singapore schools (two primary colleges and two junior colleges) to manage barriers to technology integration. Based on their classroom observations and interviews with teachers, school leaders, and ICT heads of departments, they found that having a shared ICT vision and integration plan was like a vehicle for school leaders and teachers for having a coherent communication about how ICT could be effectively used. According to them*:*

> The vision and plan offered teachers a place to start, a goal to attain, and a guide along the way. In addition, schemes like the "buddy-system," which paired off a seasoned ICT practitioner with a novice, helped new teachers to integrate ICT into their lessons meaningfully. (p. 119)

Given the importance of having vision and goals for effective technology integration, examining the Palestinian Education Initiative's goals and vision for integrating computer technology into education is one of the objectives of this study.

2.8.2 Overcoming the Scarcity of Resources

Lack of adequate resources can constrain any initiative to integrate technology in the classroom. If teachers do not have sufficient equipment, time, and support to integrate technology, it will be difficult to achieve meaningful change in the education system (Ertmer, 1999). The literature provides some strategies to overcoming this barrier, which are outlined below.

2.8.2.1 Technical Support

In addition to the previously mentioned issues and strategies surrounding computer integration in classrooms, teachers need support to effectively integrate computer use into their lessons. According to Lim, Teo, and Wong, 2003; Lim and Khine, 2006; and Cuban, 2001, it is the most common problem teacher faces when integrating technology into their teaching We saw previously that unreliable technology was one of the barriers to computer integration. Therefore it is essential to provide the teachers with this sort of technical support. The literature mentioned that it can be beneficial for schools to appoint a computer technician to troubleshoot

hardware and software and help with the installation of software (Lim, Teo, & Wong, 2003; Lim & Khine, 2006; Cuban, 2001). One of strategies that helped the teachers in Lim and Khine's (2006) study was seeking the help of other students who already know or training some students to assist students in solving simple technical issues. This point is really interesting to explore in this study especially in context with high power-distance culture where teachers cannot easily admit to students that they do not have a certain technology skills.

2.8.2.2 Availability of Technology Tools

In a survey of schools from 26 countries, Pelgrum (2001) found that insufficient numbers of computers was the most frequently mentioned barrier to the use of technology in schools. This finding was supported in many other studies (Sandholtz, Ringstaff, & Dwyer, 1997; Alwani & Soomro, 2010; Toprakci, 2006; Williamset at al, 2000). Therefore, to ensure computer integration into teaching, teachers should have immediate and easy access to computers; school administrators and policy makers should equip all classrooms with computer tools (Qablan, et al, 2009; Ertmer, 1999).

Hew and Brush (2007) studied ways to improve access to technology in schools that have computers in a centralized computer lab. After reviewing 48 studies about barriers and strategies to computer integration, they identified two strategies. In one of the reviewed studies, Becker (2000, as cited in Hew & Brush, 2007) found that by placing several computers directly in the classroom, secondary school teachers who received 5-8 computers were able to use computers twice as much as their counterparts who used computers in a shared room. This strategy was also recognized by Qablan et al (2009) in Jordanian schools. The second strategy for overcoming the lack of access, according to Hew & Brush (2007), is to rotate students through the computer labs in groups. In that way, teachers can divide students into groups as a reading and computer center and then students can switch and make rotations among learning centers.

Providing technical support and tools to aid technology are among the strategies that were mentioned in the literature to overcome the scarcity of resources. Those strategies are hard

47

to maintain especially if the countries lack resources; to sustain those tools, countries should seek the support from the community and from other sectors in the country.

2.8.2.3 Lack of Time

Several strategies were identified to help overcome the time constraints that prevent teachers from integrating technology. According to Qablan et al (2009), one strategy to help overcome the rigid scheduling and timetabling is to involve teachers in the process of preparing the school-timetable at the beginning of school year. In addition, Becker (2000) found that teachers who have longer blocks of time (90-120 min.) for classes were more likely to report frequent use of technology during class than teachers who have 50 minute classes. I think there would be a challenge in adapting this strategy to Palestinian context especially with the fixed time block for each class.

One of the methods to reduce the class load that was mentioned in the literature was to reduce the overall curriculum content. For example, Singapore's MoEHE, as cited in Hew & Brush (2007), has achieved 10-30% content reduction in all curriculum subjects in secondary schools without compromising on basic foundation knowledge. To address time constraints, teachers can collaborate with other teachers. Lim and Khine (2006), for example, found the collaboration of teachers to produce technology mediated lessons and sharing the material with each other was able help teacher save time.

Some ways to implement this policy include increasing the length of the class; for example instead of having 45 minutes block time for each class, class time can be increased into 60-90 minutes. At the same time, I think decision-makers should also reduce the amount of content that is being taught, so that teachers not need worry as much about content coverage. I wrote earlier in the first chapter that computer technology, if it is integrated effectively, will provide the chance for students to look for needed or additional information.

2.8.3 Changing Attitudes and Beliefs

Teachers decide what happens in the classroom and how technology is integrated in daily practice. Therefore, a teacher's beliefs and attitudes toward technology integration can have a significant impact on its successful implementation (Su, 2009). As mentioned earlier in this literature review, in order to change teacher's beliefs about computers, they need new experiences that force them to question and become dissatisfied with their existing beliefs. Introducing teachers to various types of computer applications that can support their immediate needs is one of the most effective approaches to change teachers' attitudes about technology. This, as stated by Ertmer (2005), may increase teachers' confidence about technology and increase the probability of them starting to question their existing beliefs and pedagogy.

Institutional support and changing teachers' knowledge and skills are some of the factors that can facilitate a change in teachers' attitudes and beliefs about technology. According to Hew and Brush (2007), institutional support includes: having a vision and plan of where the school wishes to go; providing necessary resources for teachers; providing ongoing professional development for teachers; and finally providing encouragement for teachers. Some of these ideas are expanded upon below.

2.8.3.1 Providing Professional Development

Professional development in the use of computers for teaching and learning is recognized as having a key role to play in the process of enabling and supporting teacher's use of ICT for teaching and learning (Tearle, 2003). Effective professional development can influence teachers' attitudes and beliefs towards technology as well as provide the knowledge and skills to employ technology in classrooms (Hew & Brush, 2007). According to Hew and Brush (2007), for professional development to be effective, it should provide teachers first with skills and knowledge about technology because without that the teacher will not be able to recognize the value of computer integration into classroom teaching.

Having basic skills in the use of a particular technology is not sufficient to enable teachers to teach with technology; therefore effective professional development should focus on methods for teaching with computers, not just on computer literacy, to provide teachers with opportunities to develop effective instructional practices to support computer integration (Beaudin & Grigg, 2001).

Effective professional development also should enable teachers to be active learners in several ways, such as providing opportunities for teachers to observe other teachers who use and integrate computers effectively in their classrooms (Ertmer, 2005). Involving teachers in the planning of professional development is another way to make teachers active learners (Cuban, 2001). Policy makers and administrators, according to Cuban (2001), must understand teachers' expertise and perspectives on classroom work and engage teachers fully in the design and in the implementation of the professional development. Involving teachers in professional development planning fosters commitment to the program and makes it relevant to their needs and their classroom contexts (Sandholtz, 2001; Su, 2009).

Professional development does not have to be always in the form of training or workshops. Teachers might have to make classroom visits to other teachers who integrate computers fully into their lessons in order to really see how technology integration can be successful.

2.8.4 Student Learning Assessment

Since effective technology integration will inevitably change certain educational practices, methods of assessing educational success should be adjusted to meet these changed practices. Otherwise, the old standards of assessment will continue to stand in the way of the effective use of technology in education. Assessment in teaching and learning is an important part of educational settings and cannot be ignored in classrooms. As Ertmer (1999) noted, assessment provides a necessary and powerful reality check, but it is also important that policy makers and teachers should be involved in an extensive discussion around the use of assessments and board

50

examinations and come up with ways that help in fairly assessing learning with the use of computer technology. The goal of the Palestinian MoEHE is to shift teaching and learning more toward student- centered approaches; therefore, curriculum should be modified to adapt to this shift. This, in turn, implies a change in assessment. Specifically, the current format of standardized tests that is in use in the Palestinian education needs to be changed if a constructivist learning environment is to be nurtured. There are several ways of assessing students other than tests that are mentioned in the literature. For instance Qablan et al (2009) suggested that mastery-based and performance-based tests should be encouraged instead of using standardized tests to assess students' abilities. Table 6 provides a comprehensive view of all the challenges and the strategies that were mentioned in the above discussion, summarized in Table 6 below.

Table 6: Summary of Strategies to Overcome Barriers of Computer Technology Integration

Barriers	Strategies
Lack of access to technology	✓ Put technology directly into the classrooms rather than in centralized locations (Becker, 2000; Qablan et al, 2009) ✓ Rotate students in small numbers through classrooms (Hew & Brush, 2007)
Lack of time	✓ Encourage collaboration between teachers to create technology-friendly lesson plans and materials (Lim & Khine, 2006) ✓ Reduce the overall curriculum content MOE Singapore as cited in Hew & Brush, 2007
Lack of technical support	✓ Use student technology helpers (Lim, Teo, & Wong, 2003; Lim & Khine, 2006; Cuban, 2001)
Leadership	✓ Have a shared vision (Ertmer, 1999; Lim & Khine, 2006)
Timetabling	✓ Involve teachers in the process of preparing the school-timetable at the beginning of school year (Qablan, Abuloum et al, 2009) ✓ Encourage schools to change their time-tabling schedules to increase

	class time to double period sessions Hew & Brush, 2007
Attitudes and beliefs	✓ Provide institution support (having vision and plan; providing the necessary resources; providing ongoing professional development; encouraging teachers) (Hew & Brush, 2007) ✓ Introduce teachers to various computer applications that can support their immediate needs as an effective approach to reach teachers (Sandholtz et al, 1997; Ertmer, 2005)
Skills	✓ Support professional development that has three essential overlapping qualities: (a) it is appropriate to the needs of the teachers and classroom practice, (b) it provides opportunities for teachers to engage in active learning, and (c) it focuses on technological knowledge/skills, technology-supported pedagogy knowledge/skills, and technology-related classroom management knowledge/skills Hew & Brush, 2007; Ertmer, 2005)
Assessment	✓ Teachers & decision-makers should be involved in an extensive discussion about the use of assessments and board examinations and come up with ways to help assess the learning process with the use on computer technology (Qablan,et al, 2009)

2.9 Framework for Effective Computer Integration

UNESCO Institute for Statistics (2009) has created a framework for effective computer integration that is considered a guideline for any policy that attempts to integrate computers into education. This framework also summarizes all the stratgies that were covered earlier. As shown in Figure 2, the framework looks at policies and strategies to gain insight into how to effectively integrate computers into education. As indicated by UNESCO Institute for Statistics (2009) , effective computer integration into the national education system should have "clear goals and policy environment enabled by national authorities that support the use of ICT in education" (p. 23).

The first input of the framework is the provision of ICT facilities to educational institutions. ICT facilities are described as access to computer technologies like hardware, software, including Internet connection, as well as providing support for teachers while using computer technology.

Training teachers in ICT-enabled pedagogy is considered the second step in computer integration initiative. According to UNESCO (2008), this input mostly focus to consider potential policy questions, such as what percentage of the teaching staff is able to adapt their competencies to an ICT-enabled instruction model or to teach ICT subjects

One potential policy question that relates to curriculum-development in the third step is: are changes in the curriculum delivery using ICT and to what degree are ICT taught as a subject? Based on the three steps, the use of ICT in teaching is considered as a process in the framework in which policy makers can verify the nature and intensity of ICT use in schools.
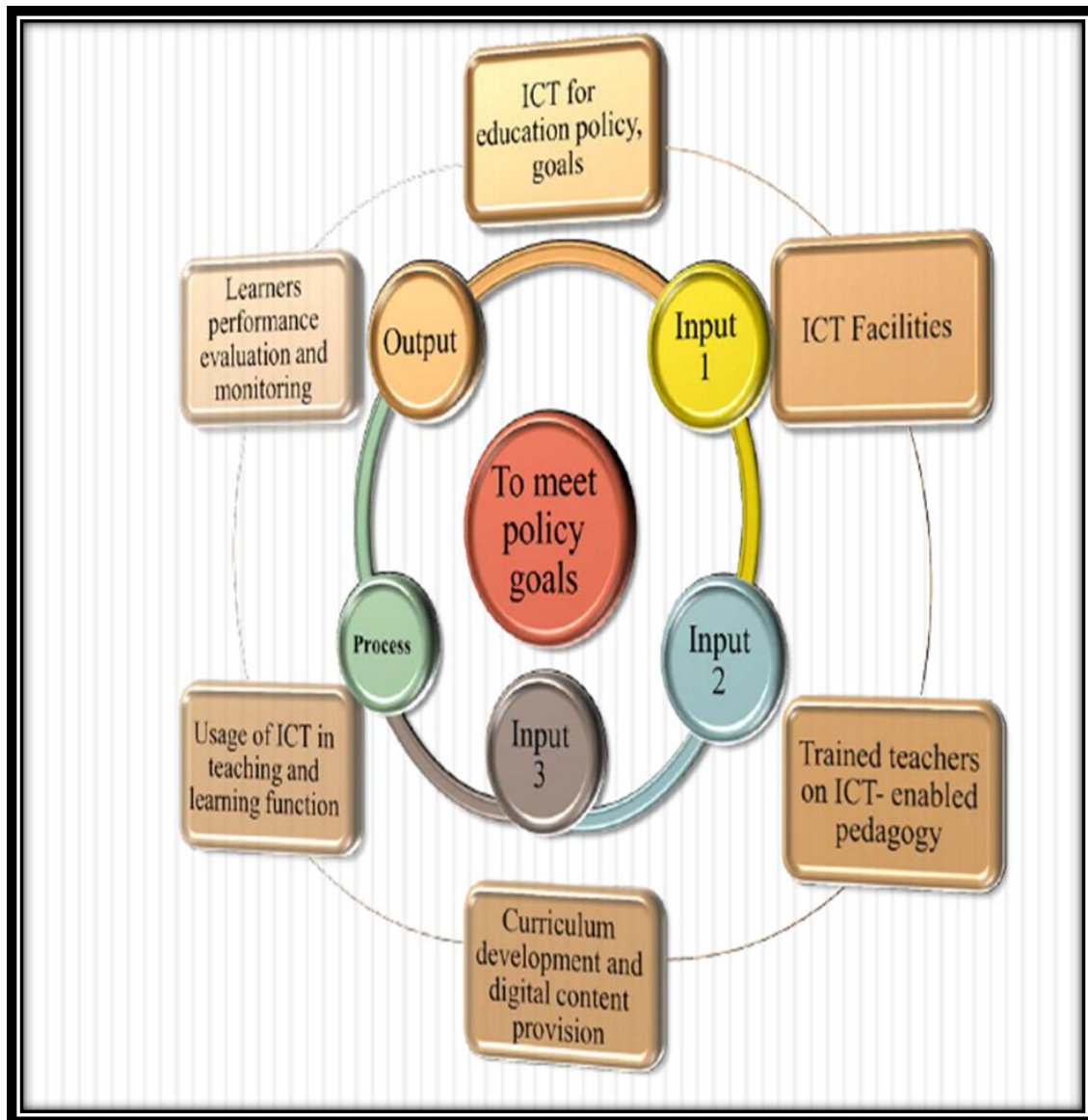
Figure 2: Framework for Effective Computer Technology Integration

2.10 Digital Divide & Digital Inequality

Enthusiasts about computer technology refer to the benefits of computer technology in reducing inequality in education and providing the chance for all students to learn and access information, including students with special needs. Cautious people, on the other hand, alert that an unequal distribution of computer technology and internet access across schools will lead to increasing the inequality among people and widen the "digital divide" (Hargittai, 2003). The

concept of a digital divide, as described by Roblyer and Doering (2010), refers to the discrepancy in access to technology resources among students from different socioeconomic groups. Hargittai (2003), on the other hand, expanded that definition of digital divide to include other diminsions of technology use such as the quality of equipment, autonomy of use, the presence of social support networks, experience and online skills.

Hargittai's (2003) argument for including these factors is that, as more people start using computers and the internet for communication and information retrieval, it becomes less useful to look at who is online and who is not; rather we need to look at differences in how those who are online access and use the technology. Such a refined understanding of the "digital divide" implies the need for a more comprehensive term for understanding inequalities in the digital age. Hargittai suggested the term "digital inequality."

Some scholars have suggested looking at access from a broader holistic apprach. Wilson (2004), for example, identified five components for full social access: 1) physical access which refers to proximity that the potential users have to physical infrastructures and applications in a well-defined geographic location; 2) financial access refers to the capacity of indiviuals and communities to afford getting the median and the connecitvity; 3) cognitive access which considers whether people are trained to use the medium, and finds and evaluates the type of information they are looking for; 4) content access refers to the potential user in a developing country will find all enough form of materials access when they go to the on the web and Internet like in their own langauge; and 5) institutional access refers to access to computer technlogy at home, schools, community centers, cyber-cafes. Warschauer (2004) has also offered an alternative approach, suggesting that in addition to the physical sides of access, other factors such as content, language, literacy, education, and institutional structures must also be taken into consideration when assessing the level of information and communication technology use in a community.

55

Hargittai (2003) considered other ways of measuring students' access to technology beyond the basic measure of access to a medium. She proposed that access be measured by: 1.) technical means (quality of the equipment); 2.) autonomy of use (location of access, freedom to use the medium for one's preferred activities); 3.) social support networks (availability of others one can turn to for assistance with use); 4.) experience (number of years using the technology, types of use patterns); and 5.) skill (the ability to efficiently and effectively use the new technology).

In summary, the way scholars classify complete access to technology extends our attention beyond the numbers of mediums that are offered. I think those elements are very important to consider in policy and planning, because focusing on the infrastructure alone will not reflect full access to technology and the effectiveness of computer use.

2.11 Summary

This chapter covered topics related to computer integration, such as the definition of computer integration from a student-centered perspective and how technology is used in the classroom. The challenges to integrating technology and the strategies to overcome those challenges are well presented in the literature and were covered in this chapter. Based on what was presented, I will lay out some of lessons learned from this chapter:

- One of the main lessons learned from this literature review is that computer technology has the potential to be "a change agent;" it is a means of change in the content, methods, assessment, and overall the quality of teaching and learning, moving toward constructivist-oriented classrooms.

- The challenges and strategies mentioned in the literature are interrelated. For example, dropping computers into classrooms and sending teachers for training do not work without addressing second order barriers. If teachers are not convinced of the importance of integrating computers into teaching, they will not use it despite having easy access to computers. Because of the continual interaction between the barriers, I think it would be more effective to start working on the first- and second-order barriers at the same time. My thought was inspired by Ertmers' proposal (1999).

- Administrative support is very important to ensure effective technology integration. If school districts and principals believe in computer technology integration and its role in teaching and learning, then there is a strong possibility that they will work

- The benefits of technology integration are best realized when learning is not just the process of memorizing facts from teachers to students. To have student-centered pedagogy, teachers need to empower students with the skills to be thinkers and problem solvers. Teachers need to provide environments in which students can access information from multiple sources to connect, organize, and discover the relationship between various sorts of information, and technology is the best tool to do that. Students can use the same technology to communicate and

collaborate with students and share ideas and thoughts. Computer technology provides excellent tools for communication and collaboration, such as word-processers, databases, spreadsheets, hypermedia and multimedia application**.**

The Palestinian MoEHE will undoubtedly face many challenges while integrating computer technology into education. However, I think, and the literature also shows, that the first step in achieving meaningful computer technology is having a vision of how and why schools should integrate computer technology into education. Saying that, I think the first step in pursuing research on computer technology topic in the context of Palestinian schools is to understand the Palestinian MoEHE's vision and goals of computer integration.

CHAPTER 3

STUDY DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes the mixed methods design and procedures used to conduct this study with the purpose of exploring Palestinian high school teachers' beliefs regarding computer technology integration and how it is being integrated in classrooms. The chapter describes and justifies the data-gathering method and outlines how the data was analyzed. Further, it describes how the study maintained scientific rigor research standards in terms of procedures and trustworthiness. The chapter also reflects on ethical considerations of protecting the identity and confidentiality of participants. Finally, it discusses how reliability and validity of the study had been maintained.

This chapter will present the research questions with reference to the tools that are employed to answer those questions. Data collection, instrumentation, and analysis will be discussed and explained at the end of this chapter.

3.2 Research Design and Rationale

The study relies on a mixed methods design, which according to Creswell (2013) is an approach to inquiry that involves collecting both qualitative and quantitative data. According to Creswell and Plano Clark (2011), qualitative data provide a detailed understanding of a problem while quantitative data provide a more general understanding of a problem. The combination of the qualitative and quantitative approaches to data collection provides a more complete understanding of a research problem than either method alone, because each method has its own limitations and provides a different picture, or perspective, on the data (Creswell and Plano Clark, 2011).

According to Marshall and Rossman (2010), qualitative research is conducted in a natural setting with the author observing, interviewing, and gathering information for analysis to constuct a holistic understanding and representation of the situation. Quantitative research on the

other hand is an approach for testing objectives by examining the relationship between variables. These variables can be measured on instruments so numbered data can be generalized using statistical procedures (Creswell, 2013).

The intent of using this design is to combine the strengths of both methods of data collection while eliminating the weaknesses (Creswell and Plano Clark, 2011). Due to the lack of information, statistics, and studies of computer integration in Palestinian schools, quantitative research methods will be most helpful in collecting data from a large sample size.

As discussed earlier in chapter two, teachers are the gatekeepers of computer technology integration and the way technology is being integrated into the classroom reveals some of teachers' attitudes and pedagogical beliefs (Williams, Coles, Wilson, Richardson, Amanda, and Tuson, 2000). Therefore, exploring teachers' beliefs and attitudes about technology is very important to understanding how computer technology is being integrated into education. The qualitative data in the study provides a better understanding of teachers' attitudes, beliefs, and experiences regarding use of technology in the classroom (Rallis and Rossman, 2012).

What are teachers' experiences of computer integration?					
Supporting questions	Research Employed Tools				
	Questionnaire	Teacher Interviews	Supervisor Interviews	Policy-makers Interviews	Document Analysis/ Literature
Do teachers have access to Computer Technology?	X	X	X		
How do teachers talk about computer use in the classroom, and what are the reasons for using computers in the classroom?		X			PowerPoint [5]
What are teachers' pedagogical beliefs and attitudes toward integrating computers into their teaching?	X	X	X		

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[5] Power Points refer to Power Point presentations that I was able to collect during my data collection from the teachers. Some of the power points were done by teachers, the others by students.

How well do teachers feel they are prepared to integrate computers into their instruction?	X	X			
What factors influence how Palestinian public school secondary teachers integrate computer technology into their teaching?	X	X	X	X	
What are the barriers that prevent teachers from using computers in their instruction?	X	X	X	X	
How does the Palestinian MoEHE view the use of computer technology in the classroom?					
How well does the MoEHE policy match teachers' teaching practices				X	X
What kind of support does the MoEHE provide to help teachers integrate computers effectively into education?	X	X	X	X	X
What strategies does the MoEHE use to integrate computers into education?			X	X	X
What are the possible strategies that help integrate computer technology effectively into schools?					
What is the gap between the PEI Initiative's goals about technology integration and the current situation in schools?	X	X	X	X	X
What is known in the literature about effective computer technology integration?					X

3.3 Research Population and Participants

3.3.1 Survey

To get a better picture of the current situation regarding computer integration in

Palestinian schools, I administered a survey to 364 teachers in Palestinian public secondary

schools in two cities. The survey was very helpful in gauging teachers' attitudes toward integrating computers, describing the practices and specific or pedagogical instructions the teachers use to integrate technology, and detailing the resources that the teachers have access to regarding computers and Internet connectivity. The research sample population consisted of teachers who teach different subjects at Qalqilia & Azoon, Ramallah & Al Bireh secondary schools that have computer labs. The complete list of teachers is based on the list provided by the Directorate of Education in Qalqilia and Ramallah, which is maintained and updated on an annual basis. The total number of secondary schools in both education directorates was 17 schools. Of those schools, there were 364 teachers who taught different subjects such as Math, Science, Social Studies, Arabic and English languages, and Islamic studies. For this study, I used the whole population. The table below shows high schools in Ramallah & Al Bireh, and Qalqilia & Azoon and number of teachers in each school.

Table 7: Number of Participants in Quantitative Method

School Name	Number of Teachers
Ramallah Boys School	24
Spanish School	22
Ramallah Girls School	23
Al Bireh Girls School	22
Khawlah Bent Al-azwar School	17
Al Hashimya School	27
Al Bireh Boys New School	17
Aziz Shaheen School	20
Samiha Khalil School	17
Al-Shaima Girls School	24
Abu Ali Iyad School	24
Al- Omaria High School	19
Fatima Sroor Girls School	25

Al- Sa'dia Boys School	22
Al- Salaam Boys School	27
Industrial School	12
Azzon Boys High School	22
Total	364

3.4 Qualitative Data: Interviews, and Document Analysis

3.4.1 Document analysis & Policy Makers interviews

Identifying Palestinian MoEHE's vision and goals for integrating computers into schools is among the objectives of this study. To meet this objective, I studied the Palestinian Education Initiative (PEI) to determine how the MoEHE views the integration of computers into schools. To provide more depth to my analysis of policy document, I interviewed the top six policy makers at the Ministry. For these interviews, I used "purposeful sampling" seeking those participants who determine and articulate policies at the Ministry (Rallis and Rossman, 2012).

3.4.2 Supervisor Interviews

Supervisors are the link between officials at the Ministry, the educational directorates, and teachers in the field. These professionals were an excellent resource in this study, as they elaborated more on the challenges and opportunities in implementing Ministry policy through the directorates and the teachers. For this group, I interviewed six supervisors from each directorate, Ramallah & Al Bireh, and Qalqilia & Azoon. I chose one supervisor for each of the following school subjects: Arabic language, English language, Math, Science, Social studies, and Islamic education. A total of 12 supervisors from both school districts were interviewed

3.4.3 Teacher Interviews

To develop a richer and deeper understanding of teachers' attitudes and beliefs about computer integration, I also interviewed a number of teachers who were known to be active in integrating computers into their instruction as well as a number of teachers who did not integrate

computers into their instruction. I asked school principals and supervisors to nominate the

teachers, and two teachers from each subject from each school district were interviewed. A total

of 24 teachers were interviewed from both school districts. Table 8 classifies all participants

Table 8: Number of Research Participants

Kind of Data Collection	Survey		Interviews				
	Ramallah & Al Bireh	Qalqilia & Azoon	Policy Makers	Supervisors		Teachers	
# of Participants	189	175	6	Ramallah & Al Bireh	Qalqilia & Azoon	Ramallah & Al Bireh	Qalqilia & Azoon
				6	6	12	12
Total	364		6	12		24	

3.5 Data Collection Process

The Mixed Method design is a one-phase design in which the quantitative and qualitative

methods of data collection were implemented during the same timeframe with equal weight. The

design involved concurrent but separate collections and analyses of the data sets, and then the

separate results were brought together in the interpretation (Creswell and Plano Clark, 2011).

Figure 3 demonstrates the procedure for data collection in mixed method research.
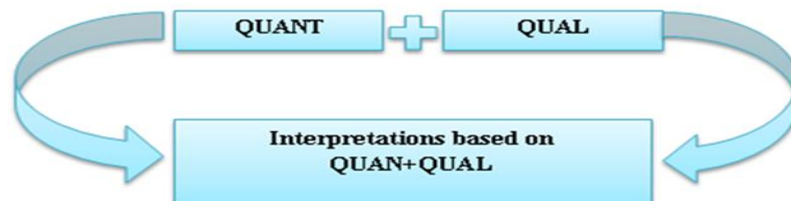
Figure 3: Procedures in Mixed Method Study

The study took place over two months of data collection. The following section describes the multiple methods that were used.

3.5.1 Survey

3.5.1.1 Developing the Items

The development of a questionnaire (Appendix C) was guided by extensive review of the literature and scales used in different educational settings (Albirini, 2004; Qablan, Abuloum,& Abu Al-Ruz, 2009; Teo, 2008; Bingimlas, 2009; Govender, 2006; Law, Pelgrum, & Plomp, 2008, Kozma, 2003; Sadik,2006). The development of this instument was specifically influenced by studies done by Albirini (2004) and Sadik (2006). Albirni's study explored the attitudes of high school English as a Foreign Language (EFL) teachers in Syria toward ICT, while Sadik's study explored factors that influence teachers' attitudes toward personal and school use of computers in Egypt. Albirini, (2004) & Sadik, (2006) relied on a widely used scale to measure teachers' attiudes toward computer use is the Computer Attitude Scale (CAS) developed by Loyd and Gressard (1984). The questionaire consisted of eight sections. A description of each section is listed below:

A.   **Attitudes and beliefs toward computer in general**: Sixteen statements compromised the attitudes and beliefs toward computer in general using 3- point, Likert-type scale ranging from *agree (1)* through *neutral (2)* to *disagree (3).*

B.   **Attitudes and beliefs toward the use of computers in education**: The attitude toward computers in education is consisted of twenty Likert-type statements rated as *agree (1)*, *neutral (2)*, and *disagree (3).*

C.   **Computer competency level:** The computer competency section is broken into two parts. The first part is composed of thirteen items that focus on common computer uses in education such as issues handling the hardware, word processing, organizational tools, and grade-keeping. Computer competency levels were quantified by the score of one 3 point scale that scored competency as *very competent (1)*, *moderately competence (2)*, and *little competent (3).*

The second part looked at resources that teachers use to gain knowledge and information about computer integration. It contained five redefined sources and teachers had to answer yes or no to each source in which *yes* reflects **1** point and No reflects *2*

D.   **Support:** The aim of this section is to indicate the kind of support teachers get for computer integration, and identify the person who offers that support. Then teachers were asked to answer a set of questions related to technology support in the classroom and they need to answer by *(1) yes, (2) no,* or *(3) do not know.*

E.   **Barriers to Computer Integration:** 11 items were created in this section and teachers were asked to categorize each item as *(1) a major barrier, (2) a minor barrier,* or *(3) not a barrier.*

F.   **Computer Information:** The aim of computer information section is provide general information about the number of computers at school and the Internet connectivity.

G.   **Computer Access:** The computer access section consisted of three statements. These three statements took into account where teachers might have access to computers: at home, in school, or other places. The last choice was given to accommodate locations not mentioned in the first two guided responses. Computer access was quantified by scoring the three access-related items on a 5-point scale, which ranged from *never (1), once a month (2)*, *once a week (3)*, *two or three times a week (4)*, to *daily (5).*

H.   **Demographic Information**: Participating teachers were categorized based on gender, age, teaching experience, education, grades they teach, subjects they teach, and school location.

3.5.1.2 Refinement

All statements in survey were either constructed by the researcher or selected from previous research based that relevance to this current study like Kozma, 2003; Albirini, 2004; Sadik, 2006; Law, Pelgrum, & Plomp, 2008. The instrument was developed in a Survey Research Methods course that I took during the school academic semester. Feedback from the professor was provided on regular basis. The questionaire was created in the English language

and then translated into Arabic and sent to an Arabic language expert to ensure appropriateness and comprehensiveness (Appendix C).

The questionnaire included a consent form as a cover sheet for teachers to provide consent before filling out the questionnaire. The questionnaire was distributed to the 364 teachers mentioned above after permission had been obtained from the Educational Directorate in Ramallah & Al Bireh, and Qalqilia & Azoon (Appendix B).

3.5.1.3 Validity

The validity of the instrument of measurement in research refers to how well the instrument measures what the researcher intends for it to measure (Litwin, 1995).The validity of the instrument can be tested in different ways, according to Litwin (1995). Content validity is one "measure of accuracy that involve formal review by individuals who are the expert in the subject matter" (p.82). The instrument of measurement used in this study was the survey of teachers in Palestinian schools. The fact that the instrument for this study was created in an academic class under the supervision of a professor support the validity of this study. This research was conducted as part of doctoral dissertation requirement in which a group of experts can serve on a committee to help the researcher in every stage of the study. This study was under the supervision of a committee which provided support during the entire research process and therefore achieved the construct validity recommended by Litwin (1995).

3.5.1.5 Reliability

Reliability refers to the "degree of stability exhibited when a measurement is repeated under identical conditions" (Litwin, 1995, p. 84). Cronbach's alpha was used to assess the reliability of the instrument used in this study. The tables below present the reliability results for some instrument sections.

Table 9: Reliability Statistics for the Whole Questionnaire

Cronbach's Alpha	N of Items
.801	86

Table 10: Reliability Statistics for Section A

Cronbach's Alpha	N of Items
.800	16

Table 11: Reliability Statistics for Section B

Cronbach's Alpha	N of Items
.889	20

The questionnaires were distributed to schools the researcher received approval from the Ramallah, & Qalqilia Education Directorate offices. The process of quantitative data collection started by visiting each school and meeting its principal; after giving a clear description of the research, I ask for each principal's permission to distribute the questionnaires to the teachers. In most of the cases, I left the questionnaires with the principals, who returned them after 2-3 days. The response rate to the questionnaire was 80.7%.

3.6 Interviews

Interviews were used to gather detailed qualitative description of how stakeholders perceive the problem under investigation (Kalanda, 2012). Semi-structured interviews were conducted with the participants an average time of one hour. Not all questions were written ahead of time. Certain core questions were prepared and asked but others were improvised during the interview, allowing both the interviewer and interviewee the flexibility to explore certain details or discuss specific issues about the integration of computer technology (Kalanda, 2012). The interviews were recorded and transcribed verbatim for analysis after obtaining consent from the participants (Appendix E).

The interviews with the policy makers mostly looked at the ministry's goals and objectives for integrating computer technology into education, support and challenges for

computer integration in education. (See Appendix G for policy interview protocol guide). The interviews with the policy makers took place primarily in their offices.

Supervisor interviews covered their views and attitudes on technology integration, as well as the types of support that are provided for teachers, infrastructure and resources, and the challenges that face computer integration. (See Appendix G for Supervisor interview protocol guide). The interviews were conducted at the Education Directorate buildings in their offices or other comfortable places within the buildings.

Teacher interviews were structured to explore three main questions. The first question looked at how computers are being used in teacher's instructions. The second focused on finding out about teachers' attitudes toward using computers in classrooms. And the third question focused on exploring the factors that affect integrating computers in classrooms. (See Appendix F for Teacher interview protocol guide). Interviews with teachers were conducted in a comfortable place in their schools. Visiting the schools and meeting the principals was very helpful in facilitating teachers' interviews. The teachers that were interviewed, both those who used computers in their teaching and those who did not, were either nominated by the supervisors or schools' principals

3.7 Analytical Procedures

Data analysis in mixed methods research consists of two stages as Crewell and Plano Clark (2007) indicated. The first stage involved conducting a separate initial data analysis for each of qualitative and quantitative databases, then in the second stage, I validated the qualitative results with the quantitative results using descriptive statistics and other statistical analysis like T test and One-way ANOVA. Figure 4 summarizes the process of doing the data analysis
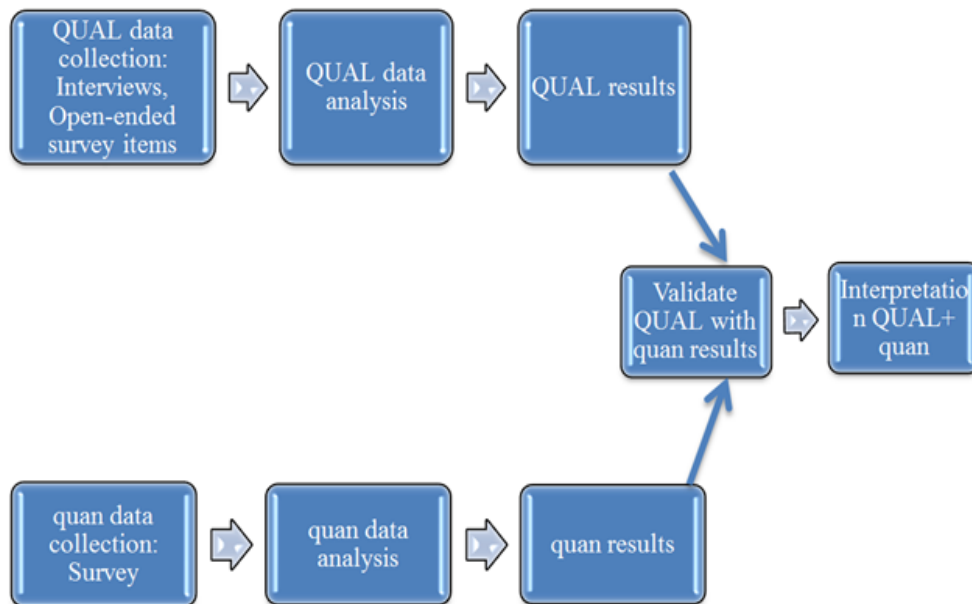
Figure 4: Data Analysis Process

The next section will highlight in details the analysis on each dataset:

3.7.1 Quantitative Data

The analysis of survey data used the statistical software package SPSS 19. Descriptive statistics was used to describe and summarize the mass of data that was collected from the respondents. Other tools for statistical analysis, such as the T test, were used to test the effect of teachers' gender, access to computers, on attitudes toward computer technology. The One-way ANOVA test was constructed to test how teachers' educational and teaching experiences affected their attitudes toward computer technology.

3.7.2 Qualitative Data

The analysis process of qualitative data was directed by Rossman and Rallis (2011) and Saldana (2009), who produced the following steps and tips:

1-   Data organization: The transcribed interviews were laid out in double-spaced format on the left two-thirds of the page, with a wide right-right hand margin for writing. The data was then

divided into short paragraphs in distinct units with a line break in between. I used interview

questions as a guide for unit breaks in order to keep the focus on my research intentions and

goals. This structure also helped my coding decisions. (See appendix H for an example of break

unit step.)

2-   Data Familiarization: Dealing with data and coding process is overwhelming, so to

familiarize myself with the data, I used some strategies that helped me cope with the large

volume of data:

- a- The break unit step that was mentioned earlier was a big aid to me.

- b- I listened to the interviews while reading them from transcriptions several times.

- c- The data was typed and organized on the computer, then printed it out in a hard copy
    and read over and over while taking notes. This strategy helped to build the
    ownership of the data and increased my connection to the data.

- d- Writing narrative memos about each teacher was very helpful in increasing the
    ownership of the work. (See Appendix J for Teacher Narrative memo)

3-   Coding and categorizing: Coding is a process that enables a person to organize and

group similarly coded data into categories. It is like labeling and linking things to lead the coder

toward from data to the idea and then to analysis and interpretation. According to Saldana (2009),

codifying is arranging things in a systematic order with different classifications or

categorizations.

Structural coding method, as stated by Saldana (2009), is a question-based code that

represents the topic of inquiry for a segment of data related to a specific research question that is

used to frame the interview. The example below explains the coding process of the structual

coding method. This example was pulled from the transcript of one of the interviews and

translated into English.

**Sub Research Question: What are teachers' experiences with computer
integration?**

Structural Code: **EXAMPLE OF TEACHER'S EXPERIENCE IN USING COMPUTER EFFECTIVELY**

Interview Protocol Questions: *How do teachers talk about computer use in classrooms?*

- What kind of instructional software do you know?
  PARTICIPANT: Mostly Windows, Excel, Power Point, and Internet
- Do you use them in class?
  PARTICIPANT: Yes, I use it all, Power Point is what mostly I use at schools. You know using Power Point slides makes it in teaching. It makes things more attractive because of sounds and motion effects.
- How to you apply computers in the classroom practices, in other word, how do you assign students to use computers in the classroom?
  PARTICIPANT: There is an English lab here in our school that 9 computers and LCD. There year I looked up on the Internet and found that students can computerize the text book units. There are interesting topics that we are covering this year like Bermuda triangle, lack of water …etc. Students were divided into group of 6 and each group responsible of digitalizing a unit. Students presented one of the units during the supervisor's visit and he liked it very much. All exam papers and worksheets also are typed on the computer. Students here in 11th grade are very active in using the computer; they did a project about the Internet, and formulated a computer club.
- In the times that you use computer in teaching, how the structure of class does change?
  PARTICIPANT: Students who are doing the presentation are in charge of using the computer and they have 30 minute for presentation and 10 minute for discussion. The other students sits in circle on the carpeted floor
- Do you use computers for planning lessons or for administrative work?
  PARTICIPANT: Sure, at the beginning of school year, I create an annual lesson plan without dates and I add the dates accordingly. That way when I want to make a daily lesson plan, everything is ready on the computer; I just add the date and print it out.
- Do you think students' level of engagement differs from the time using computers to times you are not using it? Or how do you students feel in the times that use computer?
  PARTICIPANT: First of all, students love using computers and when teachers use things that students like, the students start to love the material and the class. This makes the students work harder, which is what I noticed in English class. Some of the students' English language skills improved, specifically their vocabulary. Students got the chance to stand in front of the class and present their material, speaking English and using images, computer sounds, and color effects and that helped the students a lot.

4- Categorize the data: In this step, categories and themes were created based on the

generated structured codes.

5- Interpretation: I developed a list of important findings based on themes and categorization and supported by quotes and descriptive examples

3.7.3 PEI Document Analytical Procedure

According to Bowen (2009), document analysis is a systematic process for reviewing or evaluating documents in printed and electronic sources. Document analysis requires that data be examined and interpreted to extract meaning.

For the purpose of this study, I studied and analyzed the Palestinian Educational Initiative (PEI) to gauge their goals and objectives from computer integration into education. PEI is considered the framework that organizes all national and international projects that relate to computer technology integration. Every policy statement, according to Pal (2010) has three key elements; (1) a definition of the problem, (2) goals to be achieved, and (3) the instruments or means that are going to address the problem and achieve the goals. My analysis of PEI was inspired by the above mentioned elements.

The process of PEI analysis involves reading and taking close look at the document to formulate coding and categories, and then looking for emerging themes. Those codes and categories are based on the research questions, Pal's (2010) policy elements, and some policy aspects that were taken into consideration in analyzing international policies in SITE 2006. Some of these aspects according to (Law N. , 2009) include:

a- Clear vision and goals for ICT

b- Desired minimum level of access like student- teacher ration

c- Desired level of connectivity

d- Goal to reduce digital divide

e- Specification of on teachers' professional development in ICT

3.8 Researcher's Profile

I am a Palestinian wife and mother of four children, who had the privilege of pursuing a doctorate degree at university in the United States. I was born in Qalqilia, West Bank. Before

73

moving to US, I was a teacher in a primary school and then in a secondary school for United Nation Relief and Work Agency (UNRWA) schools in the Occupied Palestinian Territory (OPT). Also I worked as a part-time lecturer in higher education institution. I entered my doctorate study with an intention to study computer technology and education; this was due to my belief in the importance of incorporating computer technology into teaching and learning. I noticed when I was a teacher that students who showed no interest in their classes would rush into internet cafes and spent hours in front of the computers once classes were over. During my professional experience at that time, I noticed that teachers did not have the skills to use computers, but were required to use them to write exams, do worksheets, and fill out students' grades. Because teacher's lacked the skills to do these basic tasks, they also rushed to cafes for advice.

Seeing this made me believe that computer technology could have an influence into teaching and learning and I decided to explore it more. Over time, I developed a stronger interest in that topic through research and by talking with professors and people in Palestine about the integration of computer technology in schools.

This study explores ways to help Palestinian MoEHE teachers integrate computers effectively into their schools. It will be administered in Ramallah & Al Bireh, and Qalqilia & Azoon high schools in West Bank. The city of Qalqilia is where I was born, raised, and where I completed my high school education.

My personal connections to the city force me to reevaluate my role as a researcher in this study. Am I an insider researcher or an outsider researcher for this study? According to Given (2008), the term "insider researcher" is used to describe a situation in which the researcher is part of the topic being investigated. So the researcher shares an identity and language with the study participants (Dwyer & Buckle, 2009).

Despite having resigned from the teaching profession and now living outside Palestine, I still consider myself more of an insider researcher in this study because I am a Palestinian who has worked in schools in the West Bank. I feel that I have strong connections to and a

relationship with the study's participants, especially those teachers and supervisors that work in the Qalqilya school district. Those participants were my teachers, school classmates, friends and relatives.

There appear to be many arguments about the benefits and drawbacks to being an insider or outsider researcher. Some researchers indicate that it is easier for the insider researcher to gain access to people and resources (Given, 2008). Additionally, being an insider researcher enhances the depth and breadth of understanding of the issue being explored. The participants are typically more open and trusting of an insider researcher than an outsider researcher (Dwyer &Buckle 2009). The drawback to being an insider researcher, according to Dwyer & Buckle (2009), is that it increases the level of subjectivity in data collection and analysis. They state "It is also possible that the researcher's perceptions might be clouded by his or her personal experience and that as a member of the group he or she will have difficulty separating it from that of the participants. (p. 58)"

The fact that I consider myself as insider researcher made me watchful and cautious throughout the data collection and analysis stages of the study. My dissertation committee members were aware that I was an insider researcher and paid attention to that throughout the study.

3.9 Ethical Issues

Ethical concerns in qualitative research are reported and discussed more frequently than any other type of research. It is mostly because qualitative researchers work with participants face to face, over lengthy times (Given, 2008).

The study design was explained, before they committed to participate, to those involved in it. Research participants were asked to sign consent for voluntary participation in this study, and they were informed about the methodology and purpose of the study, and data collection and its procedures (Appendix E). The interviews were recorded, with consent from the participants. In

addition, the participants were informed that they had the right to withdraw from the study at any time without consequences.

To protect their confidentiality, the participants were assured that no one other than the researcher would listen to the tapes or have access to the raw data. In addition, they were informed that their names would be replaced with pseudonyms during the analysis and future dissemination of the research. It was clear for the participating policy makers that using pseudonyms to substitute their names may not be enough to protect their confidentiality but yet they were willing to participate in the study regardless of this fact.

3.10 Summary

Chapter Three has a detailed account of the research design, methods and strategies. The research used a mixed method design to achieve research goals. The process of that research was out lined. The chapter explained how data was collected and analyzed to achieve the research objectives.

The graphic diagram below summarizes the whole "Research Design and Methodology" chapter.
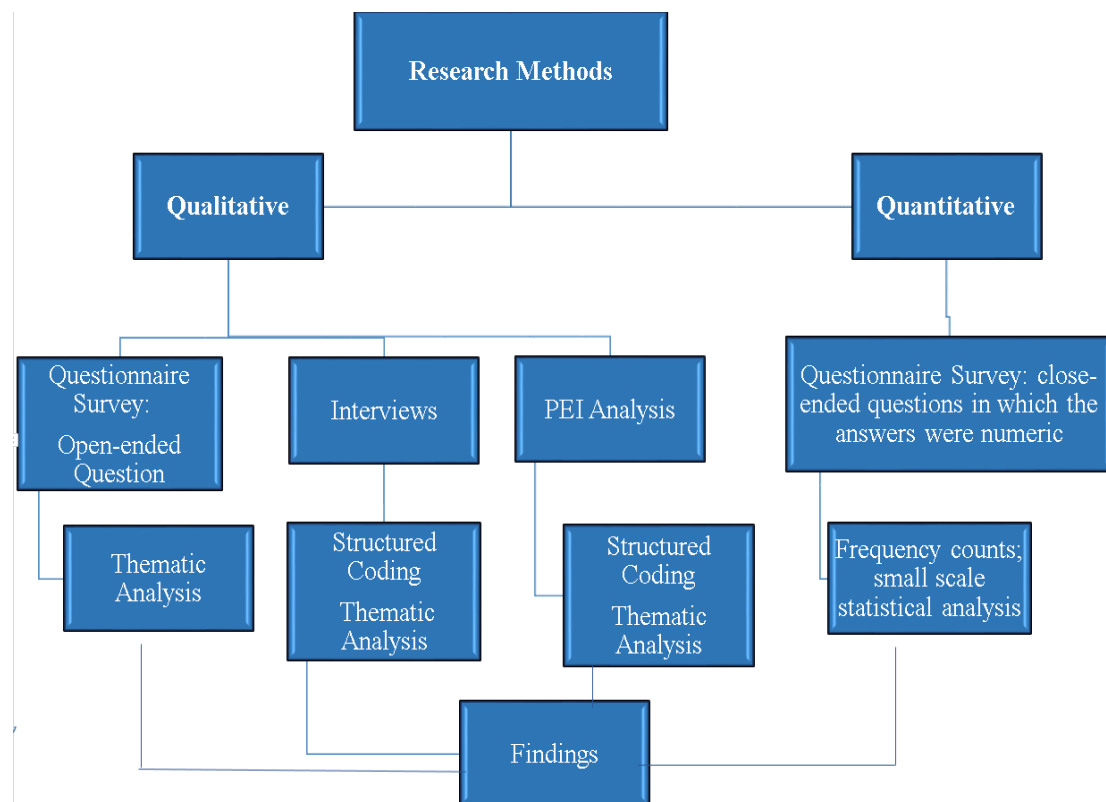
Figure 5: Summary of Research Design and Methodology

CHAPTER 4

PALESTINIAN CONTEXT

4.1 Introduction

This chapter describes the setting in which the research was conducted. It starts by looking at the broader context of education in Palestine, such as the country's geographical and economic situation., It then moves on to discuss more specific aspects of the country's education system, and how ICT factors into education.

Before the British Mandate in 1920, ancient Palestine reached from the Mediterranean Sea in the west to the Jordan Valley in the east and from the mountains of Lebanon in the north to the Red Sea in the south. It covered about 26,322 square kilometers. According to Mikki and Jondi (2010), Palestine as a political entity was created after the Second World War as a consequence of the 1948 Palestinian War and UN partition.

During that time much of Palestinian land came under Israeli occupation and as a result the state of Israel was created in the area which is called in figure 7 "Palestine Occupied" and more lands were occupied in 1967 which is called in the map West Bank and Gaza. The occupation of the West Bank and Gaza officially lasted until 1993 Oslo agreement but practically, on the ground, the occupation exists today.

Figure 6: The Map of Palestine

The Oslo agreement was signed between Palestinian leader Yaser Arafat and Israel Prime Minister Yitzhak Rabin in the White House in the presence of U.S. President Bill Clinton and King Hussain. The first stage of the agreement was mutual recognition and Israeli withdrawal from the occupied territories with Palestinian administration in certain areas in West Bank and Gaza. This constituted the Palestinian Authority territories. This withdrawal would begin after five years of negotiations supposed to lead to a final settlement agreement and declaration of Palestinian state boarder that never happened.

The rest of historical Palestine is currently recognized as Israel. The Israeli settlements are still there in West Bank and have been growing steadily by around 5.5% each year (OCHA, 2007). In 2007 approximately 450,000 settlers lived in the West Bank including East Jerusalem, alongside 2.4 million (OCHA, 2007). The West Bank as it appears on the map is located to the west of the Jordan River and the Dead Sea. It contains 5. 800 square kilometers and is divided into three geographical regions. The northern region includes the districts of Nablus, Jenin, Tulkarim, and Qalqilyia. The central region includes the districts of Ramallah and East Jerusalem, and the southern region which includes the districts of Bethlehem and Al Kaliel (Herbron) districts (Mikki and Jondi, 2010).

The Gaza Strip is a rectangular coastal area on the eastern Mediterranean. It is 28 miles long, 4.3 miles wide at its northern end, and 7.8 miles wide as its southern end. It is bordered on the south by Egypt, on the West by the Mediterranean Sea and on the north and east by Israel and its main city is Gaza (Mikki and Jondi, 2010).

Because of provocative actions taken by Israel, especially after Ariel Sharon visited holy places in East Jerusalem (Pressman, 2003), the second Intifada arose. This had several consequences, the most critical of which was the re-invasion of most of the West Bank by Israeli Armed forces leading to a virtual collapse of the emergent quasi-state structure and institutions, with serious implications for service provisions. During the second intifada, Israeli soldiers restricted all movement between cities and villages within the West Bank and Gaza through

hundreds of check points. In August 2005, Israel withdrew from Gaza and evacuated all

settlements, leaving it under the PA, but maintained its control over Gaza's air, sea space, and

border. The situation in West Bank remained the same (Khawaja, Assaf, & Jarallah, 2009).

In 2012, the Palestinians submitted an application for non-membership status at the

United Nations. On November 29, 2012, during the general assembly Palestine was accorded

Palestinian non-member observer status with 138 votes in favor, 9 votes against, and 41

abstentions (United Nations, 2012). Although Palestine was diplomatically recognized as the state

of Palestine, nothing had changed on the ground.

Before I go any further I would like to note here that when I talk about Palestine, I mean

West Bank and Gaza Strip and annexed East Jersualem,[6] areas that are now under Palestinian

Authority. For the purpose of this study, however, I will focus on the West Bank area.

4.2 Economic Status

The GDP per capita in the West Bank is $5,728.0. According to the Palestinian Central

Bureau of Statistics, 23.7% of the economically active Palestinian population residing in West

Bank were unemployed in 2010 (2011 ،الجهاز المركزي للإحصاء الفلسطيني[7]), with a poverty rate of

18.3% and literacy rate of 94.9% (2011 ،الجهاز المركزي للإحصاء الفلسطيني). The Gaza Strip is

considered poorer than the West Bank because of an International embargo that put into effect in

2006 after Hamas won the election and formed the first Hamas-led government. Things got even

worse in Gaza in June 2007 after Hamas took over Gaza and Israel sealed all borders in Gaza.

The poverty rate in Gaza Strip according to (2011), الجهاز المركزي للإحصاء الفلسطيني is 38%

Table 12 shows several economic indicators for West Bank. Palestinian Authority

depends on international organizations and donors in covering its expenses. According to (Mikki

and Jondi, 2010), international organizations and donors contribute to the funding of the PA and

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[6] Although East Jerusalem is still annexed, Education is administered by PA

[7] 2011 ،الجهاز المركزي للإحصاء الفلسطيني

to Palestinian education as well, and Palestinian governmental spending on education is around

20% of total budget.

Table 12: Economic Indicators for West Bank

Indicator	West bank
Population (million)	2.58
Total area (km2)	5. 800
Average household size	5.5
GDP per capita (Palestinian territory)	$5,728.0
Unemployment rate	17.2
Poverty rate	18.3
Adult Literacy rate (15 years and above)	94.8

Source: 2011/2010 الجهاز المركزي للإحصاء الفلسطيني

4.3 Education System in Palestine

There were three types of schools in Palestine during the British Mandate: public schools

that were controlled and supported by mandate government; national schools which were

supervised by the private sector; and the international ones which were supervised by religious

charities like Catholic or Protestant schools.

Education in Palestine during the Israeli occupation was affected by some Israeli actions

toward curriculum, schools, teachers, and students. Palestinians were not able to use their own

curriculum. At the beginning Israelis tried give Palestinians the Israeli curriculum but Palestinians

refused at that time. Therefore, the West Bank had to use the Jordanian curriculum system and in

Gaza strip, they had to use Egyptian curriculum. Schools during that time were managed and

financed by the Israeli occupation and, during the first intifada from 1987-1993, Israel pursued

the closure policy for schools for several days and months.

As a result of the Oslo Agreement, the Palestinian National Authority (PA) was

established in 1994. The PA assumed control of the administration and services in many areas of

Palestinian life, including education in in West Bank and Gaza. The MoEHE was established that same year.

Because Palestinians prior to 1994 had never had their own school curriculum, the development of a national education system became a high priority for MoEHE. This was also an opportunity to develop a Palestinian curriculum after relying on the Jordanian and Egyptian curricula. The first five-year plan 2000-2005 was designed and focused on increasing access to education through school construction and ensuring the inclusiveness of schools, especially for girls and children with disabilities. Early childhood education programs, as well as technical and vocational education and training were also addressed in the first five years plan (Nicolai, 2007; Mikki and Jondi, 2010).

4.4 Education under Occupation

Despite all the extreme difficulties in Palestinian lives under occupation, Palestinians scarifies to invest in education. It is considered a vital element of resistance for living and having a better life. We can't talk about education under occupation without mentioning the Apartheid Wall; it is considered one of the main difficulties people are facing on the ground. The Apartheid Wall is estimated to be 730km long with 9-12 meters high of concrete, fences, or razor wire and cameras (Stop the Wall, 2007). Therefore schools within the West Bank are locked in ghettoes behind walls and checkpoints, making access to education extremely difficult. Movement for the students and teachers is also extremely difficult, because they have to wait for hours in front of the Apartheid gates (Stop the Wall, 2007).

According to EAPPI, (2013) report, students lack protected access to education and face a range of dangers and obstacles on their way to and from school. They must travel long distances and are confronted with long delays and harassment during searches at military checkpoints along the West Bank, including East Jerusalem. They must navigate around other types of closure obstacles and pass through closed military zones while being exposed to the risks of settler and military violence on their school commutes. As of 31 August 2012 according to the report, 24

incidents of denial of access to education were documented in Palestinian territory, directly affecting more than 4,000 Palestinian students.

These problems result in drop-out, lack of attendance, decreased learning time in school, and deterioration of the quality of learning, as well as teachers' lack of motivation in

4.5 Organizational Structure of Palestinian Education within Palestinian Authority

Education in the Palestinian territories is centralized around curriculum, textbooks, instructions, and regulations. The MoEHE publishes textbooks for all levels which are available online on the Palestinian Curriculum Development Center's Website (www.pcdc.edu.ps). Schools in the Palestinian Authority (PA) serve 1,129,538 million students: 668,754 students in West Bank and 460,784students in Gaza Strip (المركزي الجهاز, الجهاز المركزي للاحصاء الفلسطيني 2013) (الفلسطيني للإحصاء, 2013). The Palestinian schools are operated by three different sectors: the MoEHE, which educates 65% of all school students; the United Nations Relief and Work Agency (UNRWA) which educates 24% of the students; and the private sector which reaches 6% of the students. Table 13 shows the number of students, teachers, schools, student-teacher ratio, and the average number of students in the class in the governmental, UNRWA, and private schools based on Palestinian Central Bureau of Statistics 2011/2012.

Table 13: Organizational Structure of Palestinian Education

	Government	UNRWA	Private	Total
Students	761,691	270,791	97,056	1,129,538
Teachers	36,553	9,908	5872	52333
Schools	2005	343	359	2707
Student/Teacher	23	29	16.7	
Student average/class				
Primary	30.5	35.9	23.4	
Secondary	28.3	No schools	18.2	

Pre-school learning (Kindergarten) is available in Palestine for two years prior to 1st grade. Basic schooling is compulsory from 1st grade to 10th grade. General secondary schools and a few vocational secondary schools teach Grades 11-12. The United Nations Relief and Works Agency for Palestine Refugees (UNRWA) has schools in the refugee camps dealing with students from 1-10 grades but not Grades 11&12 (Mikki & Jondi,2010).

The development of a national curriculum was a highly priority interest among the MoEHE as was mentioned earlier. The next section of this paper will highlight them main points in the Palestinian curriculum development process.

4.6 The Palestinian Curriculum Development Process

The MOEHE assumed control of curriculum matters after establishing a Curriculum Development Center (CDC) in Palestine in 1999. The new Palestinian curriculum has culminated in a set of textbooks assigned to single academic subjects, such as the Arabic Language, Mathematics, History, Science, etc. For the first time, the MOE and its CDC introduced both civic and national education curricula, a step that was considered an important innovation among most Palestinian educators. However, studies on Palestinian curricula in general reveal that the textbooks create homogenous curricula that are fundamentally similar in their philosophy and approach to many traditional curricula used in different countries (Wahbeh, 2003). In their study of primary education in Palestine, Al-Ramahi and Davis (2002), as cited in Wahbeh (2003), found that the new curriculum is highly classified by different experiences, skills and subjects, where each subject kept its status in the hierarchical order of knowledge, at prescribed times, using subject-based textbooks.

The MOE according to (Wahbeh, 2003) imposes an educational system that is quite similar to the ones that exist in various other Arab countries. The rules of the Palestinian Education System rest on a narrow social base, bureaucracy and an authoritarian approach to management. Palestine has a centralized educational system in which teachers enjoy little autonomy. According to Al-Ramahi and Davis (2002) this centralization was the main barrier to

implementing the integrated-learning project and a child-centered approach in Palestinian schools. Wahbeh (2003) provided an example in his study as a way to show the authoritarian role of science supervisors. The focus group in his study revealed that the training programs held by the ministry supervisors are frustrating because they are mandatory for teachers but irrelevant to teachers' actual needs and insufficient to change teachers' beliefs and practices. Wahbeh (2003) went on to say that despite the fact that the ministry has worked hard to improve the supervisory system at the ministry, teachers still see supervisors as inspectors who visit their classrooms with the intent of detecting teacher's weaknesses rather than helping to improve teachers' skills.

The concept of authoritarianism in education was also dicussed by Palestine: Human Development Report , (2002). Accroding to the report, Palestinian schools are still marked by "authoritarianism" in a community controlled by "hierarchical" relationships. Team or collaborative relationships in the Palestinian education system are still weak.

Wahbeh's (2003) research of analyzing Palestinain science textbook, classroom observations, and interviews with teachers, focus groups with principals, teachers, and parents revealed that Palestinian science curriculum is embedded in science textbooks which have been approved by the MOE and given to school teachers as "ready to teach".

The texts appear to transfer a significant body of scientific knowledge to students. However, they tend to focus more on results than on the process of scientific discovery and investigation. In essence, the texts present a body of knowledge that students are expected to learn, understand and recall. Analysis of the activities in the new science textbooks reveals that most of them represent lower-order thinking activities. Students are offered the results of scientific exploration. They are not encouraged to experiment; they are only instructed to distinguish between what is true or false.

Although Wahbeh's study looked at science subject classes, I think his decription of science curriculum can be applied to other subjects taught in Palestinian schools, especially as they all emerged from same educational vision.

4.7 The Organizational Structure of the MoEHE
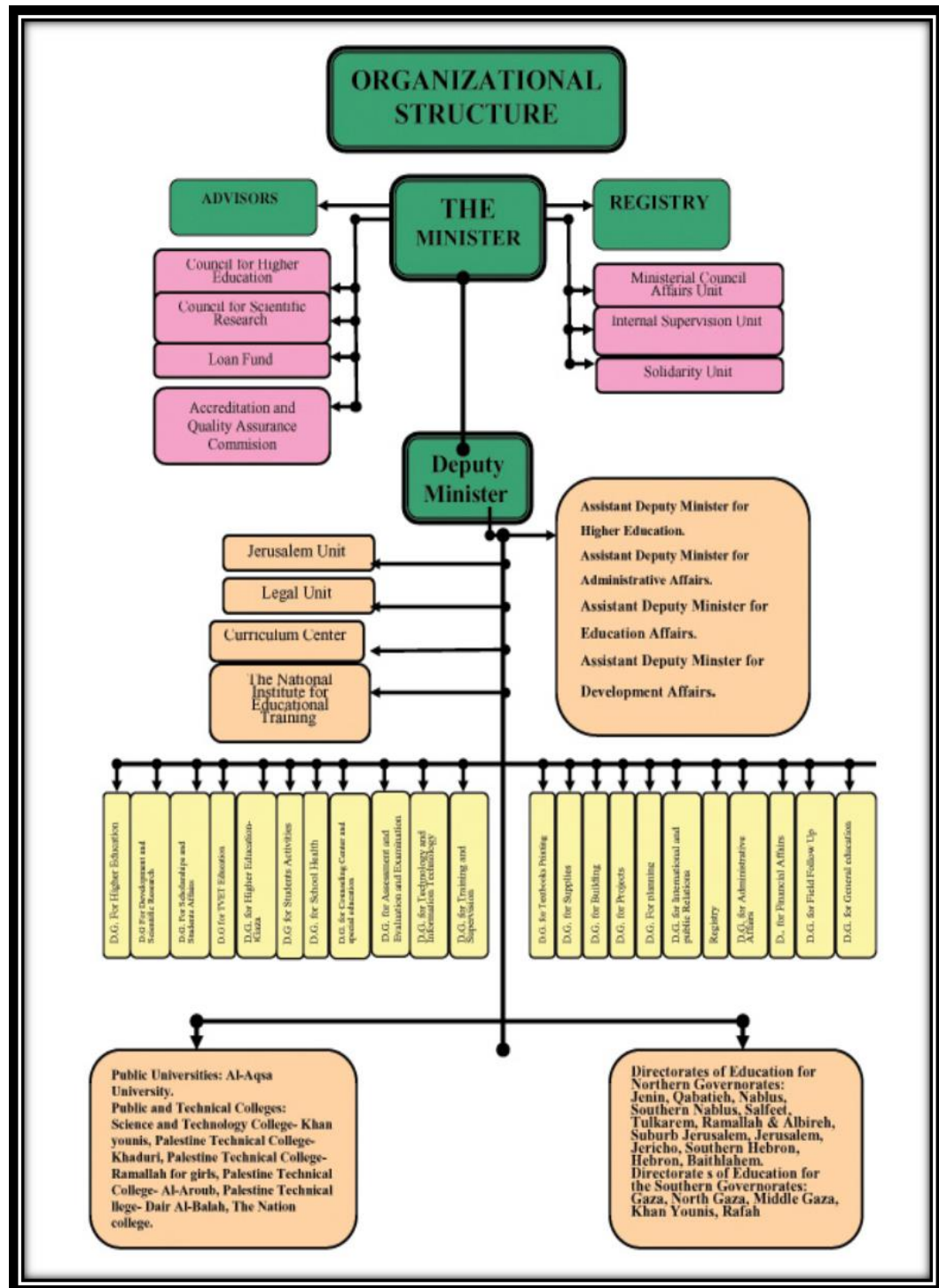
Source: Education Strategic Development Plan 2008-2012, (2008, P. 2)

Figure 7: Organizational Structure of Palestinian MoEHE

As figure 7 shows, there are 41 administrative units at the central level both in the West

Bank and Gaza. Twenty-two units are at the level of general directorates responsible for forming

educational policies, projects, and strategies in MoEHE. There are also 19 district offices

responsible for implementing policies and projects in their schools (MoEHE, 2008). The district

offices have several divisions that represent some of the general directorates in the ministry. They

are required to develop plans to improve the education process in their schools and to meet any

needs that appear in their district areas as a result of the political situation or other reasons

(MoEHE, 2010 as cited in Khalili, 2010).

4.8 The Educational Context in Palestine

The Palestinian people have relied on human resources, particularly the human mind and

skills, to survive and sustain their development as a nation (World Economic Forum, 2005). In

that context, education has been always highly valued by Palestinians; they have turned to

education as a primary means of survival, both individually and as a people. They also see

education as a key to getting their freedom and having good life. Therefore, Palestinians are

considered the most educated people in the region (Nicolai, 2007; Mikki & Jondi, 2010).

According to 2011-2013 strategic plans, Palestinian education is looking to:

> …prepare human beings who are proud of their religious values, nationality, country, and
> their Arab and Islamic culture; who contribute to the development of their society; who
> actively seek knowledge and creativity; who interact positively with the requirements of
> scientific and technological development and who are capable of competing in scientific
> and applied fields; who are open to other cultures and regional and international markets;
> who are capable of building a society based on equality between males and females and
> upholding human values and religious tolerance; and build up a higher education system
> which is accessible, multiple, diversified, flexible, effective, efficient, sustainable
> competitive and qualitative (Palestinian Ministry of Education and Higher Education,
> 2010, p.22).

There are some drawbacks to the high demand for education in Palestine. One of the

drawbacks is that schools are overcrowded: some schools have a two-shift system, and others are

housed in unsuitable buildings. There is generally a high student-teacher ratio, especially in the

Gaza strip. The ratio is around 30 students per teacher (الجهاز المركزي للإحصاء الفلسطيني, 2011). The

quality of education is low due to rigid adherence to text books and curriculum, and a lack of modern school facilities (such as libraries and labs), and ICT equipment at schools. According to the Palestinian MoEHE "the educational system in Palestine is not yet directed to 21st century competence requirements. At large, teaching and learning methods at schools follow a traditional approach and are hardly effective in promoting high-order thinking and the achievement of learning and social competences" (2008, p. 5). Teacher motivation in these schools is very low due to low salary, the lack of incentives for good teaching, and the burden of administrative and bureaucratic work they are not adequately prepared to complete (Pacetti, 2008).

Above all, the occupation of Palestine by Israel and the unstable conditions are affecting the entire society. Schools that were or are still targeted by the Israeli occupation have begun to form long and frequent closure to bombarding. There are many schools close to settlements and checkpoints and electronic gates. In the Hebron Directorate, especially in the Old City which is under Israeli control, there are around 26 schools which suffer from such conditions. These schools provide education services to 9,408 male and female students, with 312 classes and 491 teachers (The Ministry of Education and Higher Education, 2010).

In conclusion, I say here that educational development in Palestine is a unique, rich, and challenging experience. According to UNESCO[8], Palestine is one of the very few places in the world, if not the only one, where a MoEHE has been built from scratch. The education system is rich because of the eagerness and motivation of the Palestinian students to learn from speciafically other countries. It is also challenging because Palestine is not yet an independent country and is witnessing conflict on a daily basis.

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[8] Developing education in Palestine: a continuing Challenge. (n.d.).

http://www.unesco.org/education/news_en/131101_palestine.shtml

4.9 ICT in Palestine

The ICT sector in the West Bank and Gaza started in the early 1980's, mainly with IT hardware retailers and other basic services. In the early 1990's there was an increased demand for technology due to the emerging development of the social, private and public sectors in Palestine. This development was due to the signing of the Oslo Agreement and the establishment of the PNA. Since its establishment, the PNA has been one of the major contributors to the growth of the ICT sector in Palestine, demanding basic software solutions and hardware equipment for its various departments and organizations (Palestine Trade Center- PALTRADE, 2010). On the other hand, the ICT sector growth was affected by several factors according to The Portland Trust (2012) like well-educated and young population; investment leading international company like CISCO, the well-regulated banking system and the relatively investor-friendly financial environment have also helped, according to the The Portland Trust (2012).

In line with the global trends, the demand of ICT goods and services has increased significantly in Palestine in the last few years. The table below shows some ICT indicators

Table 14: ICT Indicators

Indicators	2004	2011
Percentage of Households with Own Computer	26.4	50.9
Percentage of Households with Internet Access	9.2	30.4
Percentage of Households with Telephone Lines	40.8	44.0
Percentage of Households with Mobile Lines	72.8	95.0
Percentage of Persons 10 Years and Over Who Use the Computer	35.7	53.7
Percentage of Persons 10 Years and Over Who Use the Internet	11.9	39.6
Percentage of Persons 10 Years and Over Who Have an E-mail	5.1	27.5

الجهاز المركزي لإحصاء الفلسطيني , 2011

The Palestinian Territory ranks number 62 in the world in terms of Facebook users, with 37% of the population using the social networking site. In comparison, Jordan and Lebanon are ranked 68th and 69th with rates of 35% and 35% respectively (The Portland Trust, 2012).

90

Palestinian Central Bureau of Statistics (2011), revealed that 85.7% of individuals use the Internet to access information, 79.3% for entertainment, 69.1% for communication, and 49.3% for education (Palestinian Central Bureau of Statistics, 2011).

Despite all the growth of ICT, there is still relatively low presence of ICT in the infrastructure either in the education sector at large or in schools in particular (The Portland Trust, 2012). Although the Palestinian people are considered one of the most highly educated and literate populations in the Middle East, and about 1,000 ICT students graduate from the university system each year, the skills Palestinian students receive at schools and universities do not necessarily correspond to the market needs. Therefore the educational curriculum needs to be reformed in order to promote critical thinking, entrepreneurial drive, marketing abilities and innovation (The Portland Trust, 2012).

ICT access in general and internet connectivity in particular in Palestine cannot be taken for granted due to several challenges. According to The Portland Trust (2012) and the Palestine Trade Center- PALTRADE (2010), the restrictions imposed by the Israeli authorities on access to 3G and other transmission frequencies have a very negative impact on the ability of Palestinian companies, mobile operators and Internet providers to function normally and become competitive globally (The Portland Trust, 2012).

According to Palestine Trade Center- PALTRADE (2010), the legal framework regulating telecommunication in West Bank and Gaza is outlined under the "Oslo agreement" where any arising issue is addressed through the Joint Technical Committee JTC. The JTC represents both the Palestinian and Israeli sides, and is supposed to meet on a regular basis to solve relevant problems, and meet as needed when there are more pressing issues to address. Under the Oslo agreement, the JTC is also responsible for allocating frequencies for the PNA (Palestine Trade Center- PALTRADE, 2010). As a result, any new investment on infrastructure or importing equipment for West bank and Gaza is contingent on approval and restrictions imposed by the Israeli government.

Unfortunately, since 2000 the JTC has not been able to meet regularly. The committee met only twice between 2000 and 2007, whereas it used to meet regularly prior to 2000. This has resulted in many pending issues, such as the process for releasing frequencies to the PNA, which would could be addressed at a joint meeting. The inability of the JTC to meet regularly could have been caused by limited broadband availability and relying on 2G technology mobile operator (Palestine Trade Center- PALTRADE, 2010).

4.10 Summary

Chapter four began by examining the broader context of the Palestinian education system, including its location, history, economic status. As shown in Chapter Four, Palestinian education is centralized around curriculum, textbooks, instructions, and regulations. The chapter also showed how educational development in Palestine is a unique, rich, and challenging experience, as described by UNESCO.

The bureaucratic structure of the education system in Palestine has been intensified by the new national curriculum which is considered as a replica of the educational systems in most Arabic countries. The Palestinian MoEHE showed that the quality of education was low in Palestinian schools, due to rigid adherence to textbooks and curriculum, and the lack of modern schools facilities such as libraries and labs, and the lack of ICT equipment in schools.

CHAPTER 5

FINDINGS AND DISCUSSION

5.1 Introduction

One of the purposes of this study is to explore the current situation in Palestinian secondary public schools in terms of computer technology used, teachers' beliefs and attitudes toward computer technology, and factors that support or discourage teachers from using computer technology. A mixed method research design was used to collect data from teachers to help achieve the purpose. I distributed a questionnaire to 364 secondary teachers to explore their beliefs and attitudes, describe the resources that they have to help them integrate computer technology in the classroom, and identify their competency level in using computer technology. To provide a deeper understanding of these issues, I interviewed both teachers who do and do not integrate computer technology into their teaching.

Reporting of the results and the discussion of the data is divided into two sections. The first section discusses technology integration at the policy level by examining the Palestinian Education Initiative (PEI) and identifying the goals, objectives, and strategies that the Palestinian MoEHE is implementing to support the integration of computer technology into education. To achieve that, an analysis of MoEHE policy and interviews with policy makers were employed.

The second part of the discussion will take us through the practice level and portrays pictures of computer technology usage. It will also explore teachers' beliefs and attitudes toward computer technology, and identify factors that support or hinder teachers from using computer technology.

5.2 What is Palestinian Education Initiative PEI?

The Global Educational Initiative (GEI) was established in partnership with UNESCO and the Education for All Fast Track Initiative during the World Economic Forum meeting in 2003 to create a new sustainable model for education in the developing world. The main objective of GEI is to enrich education initiatives at the global, regional, and national levels through the

establishment of multi-stakeholder partnerships involving the private sector. Jordan was selected as a pilot country at that time (World Economic Forum, 2007).

The first Palestinian Educational Initiative was begun during the World Economic Forum annual meeting that was held in Jordan in 2005. The aim of that initiative was to assist the Palestinian Authority in fulfilling its commitment towards integrating ICT in the education system within a model of public/private partnership. The focus on the first Palestinian Educational Initiative PEI was on applying technology for the promotion of educational objectives in the belief that the enhancement of education could be empowered by the use of ICT (Palestinian MoEHE, 2008). Due to the political development in 2006 and after Hamas won the election, the funding to the Palestinian authority stopped and Palestinian Educational Initiative PEI had to be put on hold for quite some time (Palestinian MoEHE, 2008).

After international donors resumed their funding to the Palestinian Authority PA, PEI was revived in 2008 with funds from the Belgium government. The recent PEI is similar to the approach taken in the three GEI in Jordan, Egypt, and Rajasthan (India) and is built on the following: 1) educational quality; 2) major role of ICT; 3) multi-stakeholder partnership.

5.2.1 Descriptive Summary of Palestinian Educational Initiative PEI Revival

PEI is a revival of PEI 2005, the document of the initiative is 89 pages and is divided into 10 chapters: "management summary"; "goals and methodology"; "context"; "Palestine Education Initiative I: ambitions and accomplishments"; "Lessons learned from other Global Education Initiatives"; "International trends in education"; "Strategic framework for the revival of the PEI"; "PEI - From Strategy to Action"; "Monitoring and evaluation"; and "Literature." The ultimate goal of the initiative is to contribute to the objective of Education Development Strategic Plan 2008-2012 EDSP in improving the quality of education in Palestine and moving toward student-centered approach (Palestinian MoEHE, 2009). PEI is not a policy on itself, it is considered as a platform for building pilot practices based on contemporary best practices and fits to the Palestinian education system.

One Decision maker explaining the EDSP plan:

The ministry is coming up through its five-year plan for 2008-2012. It is considered as "a rolling plan." It has four goals: the first goal is improving the quality of education. We do believe that the first component of improving the quality is using technology. Of course using technology is not a goal in itself; it means adapting and changing the form of using technology to benefit the education process.	الوزارة تنطلق من قاعدة مزبوط هو هدف، هدف الخطة الخمسية التالية اللي من 2008-2012 اللي هي الهدف الساسي فيها، فيها اربع اهداف Rolling Plan الخطة الخمسية، اول هدف في هدول الاهداف اللي هو Improving the quality of Education تحسين نوعية، واحنا بنعتقد انه تحسين النوعية، اول مُكَوِّن لتحسين النوعية اللي هو استعمال التكنولوجيا، طبعا استعمال التكنولوجيا ليس هدف بحد ذاته، ولكن هو يعني أن نتكييف وننوع في اشكال استعمال التكنولوجيا مشان انه تخدم العملية التربوية

When looking at the initiative, I relied on Pal's (2010) definition of any policy element, which included: 1.) a definition of the problem, 2.) goals that are to be achieved, and 3.) the instruments or means that are going to be used to address the problem and help achieve the goals. I used these elements in examining the initiative.

5.2.2 Definition of the Problem

The educational system in Palestine does not yet meet 21st century competency requirements. At large, teaching and learning methods at schools follow a traditional approach and are hardly effective in promoting high-order thinking and the achievement of learning and social competences. According to PEI, this conclusion came from analysis comparing the profile of Palestinian education with the international trends and developments. One indication of this conclusion is the Palestinian score that is achieved in international large-scale assessments like TIMMS[9] and that is well defined in the document:

> [In] the 2003 TIMMS 8th-grade math achievement Palestine scored 390 (international average: 467; top-performers Singapore: 605, South Korea: 589; best MENA-scores by Lebanon: 433 and Jordan: 424), in the 2003 TIMMS 8th-grade science achievement

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[9] "Trends in International Mathematics and Science Study-TIMMS" is an international measure the trends in mathematics and science achievement at the fourth and eighth grades. It has been conducted on a regular 4-year cycle since 1995, making TIMSS 2011 the fifth assessment of mathematics and science achievement trends.

Palestine scored 435 (international average: 474; top-performers Singapore: 578; Chinese Tapei: 571; best MENA-scores by Jordan: 475 and Iran: 453 PEI p 8.

Today's knowledge society and modern working life according to the document requires knowledge, skills and attitudes different from those learned or acquired in the past. This change requires a shift in what is taught and how it is taught in schools. According to the document, pedagogy and teaching capacity are the major areas for improving the quality of the education system that was identified by the World Bank. The reform in the pedagogy basically calls for a paradigm shift from teacher to student-centered learning strategies. A change in the teaching capacity emphasizes the fact that qualified teachers are essential to improving the learning experience of the students.

The previous section presented a clear definition of the problem, which mostly says that Palestinian students are not prepared to compete in the knowledge society and modern working life. The results of PEI support this conclusion, showing that Palestinian students do not achieve comparably high scores on international tests like the TIMMS. The PEI went on to say that the knowledge society and modern working life require knowledge and skills that are different from those that were necessary in the past, and therefore, there should be a shift of in the education system to help student learn new skills and compete in the knowledge society. The following paragraph will present the goals of Palestinian MoEHE to help change the teaching and learning process in Palestinian schools

5.2.3 Goals to be achieved

The ultimate goal of Palestinian Education Initiative PEI, 2008 is to contribute to the overall objectives of the Education Development Strategic Plan (EDSP) 2008-2012 to improve the quality of education in Palestine and move toward a student-centered learning approach (Palestinian MoEHE and Higher Education, 2009). According to one of the decision makers:

Generally speaking, it is a general plan, a sector plan. It talks about "Access" enrollment. It talks also about relevance and harmonization…. This	بشكل عام هي خطة عامة، هي خطة قطاعية، يعني بتحكي عن الـ Access، عن الالتحاق، بتحكي عن النوعية، وبتحكي عن الـ relevance والموائمة،

means the education system outcome is compatible with the working needs market. If many are graduating with high diplomas without finding jobs, it means there is a flaw in the whole country …… So the five-year plan talks about more than one several areas. There is awareness that there is a flaw or the education quality is not as it should be. It might be good in certain places and might be wrong in other places, but its effect is shared.	.... انه يعني مخرجات النظام التعليمي تكون متوائمة مع حاجات السوق التشغيلية، لانه اذا في ناس كثير بيتخرجوا معهم شهدات عالية فش شغل، معناته هدا في خلل عمستوى البلد كله، .... فهي الخطة الخمسية عم بتحكي عن اكثر من مجال، بس هي واعية انه في خلل، او في نوعية تعليم مش بالمستوى المطلوب، او قد تكون سيئة في بعض المحلات، وقد تكون ممتازة في بعض المحلات الاخرى، فكلياتها يعني بتتكامل وبتأثر، وبيكون تأثيرها مشترك

Having said that, I think surveying the objectives of the Education Development Strategic Plan is a vital preliminary step before exploring the goals and objectives of the PEI. The objectives of the EDSP as were mentioned in the initiative are:

> - Access focusing on increasing the access of school aged children and students at all education level and improve the ability to retain them.
> - Quality focuses on the improvement of teaching and learning
> - Management focuses on the improvement of the governance of educational system on different levels from the ministry down to schools
> - Relevance focuses on addressing the question of compatibility between the output in Higher Education / Vocational education and the labor market needs.

As the study focuses more on computer technology and how it is integrated into the teaching and learning process, the focus will be more on the "quality" issue and how computer technology can be used to improve the quality of the teaching and learning process.

So the "quality" in the initiative refers to four aspects of the education system: 1) the quality of the curriculum, including textbooks. Curriculum for grades 1-12 should be reviewed and textbooks should be modified. 2) the quality of the educational facilities and infrastructure, including libraries, labs and the equipment with ICT at schools. 3) the quality of the learning and teaching processes in classrooms and beyond. 4) the quality of teacher education as a prerequisite of high-quality learning and teaching.

The PEI's goal is to restructure the teaching and learning process in Palestine to help improve the results of students on national and international tests. Special attention will be given to Arabic, Math, Science, and Technology subjects. Considering the point that "frontal" teaching

and "rote" learning are predominant methods in teaching in Palestine, the focus in teaching and

learning process is on expressing a general preference for a shift from teacher to student-centered

learning. (MoEHE, 2008a as cited in PEI, 2008). The aim of the teaching and learning process as

one decision maker explained it is to make students' more active and stop depending on rote

learning:

The goal is to make learner active one, and stop her/him from depending for learning on rote learning, memorization and learning by heart. So the five-year plan reflects the ministry's strategic vision in activating the role of the learner.	الهدف انه احنا نخلي المتعلم متعلم نشط، يبطل و Rote Learning انه متعلم يعتمد على learning by heart والـ memorization والشغلات هاي، يعني الخطة الخمسية بتعبر عن رؤيا استراتيجية للوزارة وتفعيل دور المتعلم،

Taking the alignment of the Palestinian Education initiative PEI with the national goals

and objectives of Education Development Strategic Plan 2008-2012 EDSP in hand, the strategic

objectives of PEI revival are summarized as follow. Those objectives were taken as they are from

the PEI document:

> - The curricula including textbooks for grades 1-12 shall be reviewed towards the
> pronounced enhancement of more demanding objectives such as more high-order
> cognitive skills; critical thinking; problem-solving; learning competences ("learning to
> learn") and social competences (e.g. effective communication, teamwork, conflict
> resolution).
> - Assessment and test practices shall be adjusted to these requirements and corresponding
> standards represented in international assessments such as TIMMS or PISA.
> - Teaching and learning processes at schools shall be gradually improved, building
> towards learning environments representing modern principles of student-centered
> learning designs (see chapter 6). For the implementation of such a drastic innovation,
> adequate learning resources have to be developed both for the students and the teachers
> (especially cases, assignments, self-learning material).
> - ICT shall be adopted for and integrated in those applications supporting the underlying
> learning paradigm as outlined above.
> - Considerable efforts shall be taken in teacher training to prepare the teachers for their
> new role and support their shift from the sole provider of knowledge to the facilitator of
> the students learning (changing from 'the sage on the stage to the guide on the side').
> - For the promotion of the innovation, appropriate measures shall be taken to prepare
> both principals and educational managers (e.g. educational supervisors, policy makers
> and implementers in the ministry) as change agents.
> - As regards ICT-based education literacy, there shall be a major push towards raising the
> bottom line understanding in terms of how ICT can be effectively and efficiently used as
> a tool in education, and the knowledge and competences required to do so.

- The areas for improvement outlined above should be taken up both in the field of general education and in the field of technical vocational education and training (TVET). (p.32)

The document recommends that the above objectives should focus on the "endeavors" for promoting the quality in the Palestinian education system and are concentrated into four tracks:

- Track 1: Improving the quality of learning of learning environments in schools.

- Track 2: Upgrading the competences of teachers, principals and educational managers

- Track 3: Raising the bottom-line in ICT for Education Literacy and ICT-infrastructure

- Track 4: Upgrading TVET as a high-quality pillar of the educational system

Those tracks will be detailed and described in more in the section on the operational component of the initiative. The crucial question I think after what was said above is, how does The Palestinian MoEHE view ICT based on PEI? It is evident that the PEI looks at computer technology as a main "enabler for promoting effective pedagogical Innovation (Palestinian MoEHE, 2008, p.15). The policy makers and supervisors noted during the interviews that "computers are not a goal in itself but are an educational tool and a mean to improve the quality of education." According to the PEI (2008), computer technology can play different roles in the education system. Table 15 explains the role of computer technology as it is presented in the document and was supported in policy makers' interviews.

Table 15: Role of Computer Technology as was Presented in PEI

Administrative tool	A learning content	A learning resource
• For teachers to prepare their lessons • For students to work out notes or papers • Using teaching platform like Moodle • Sharing information about learning objectives classes & homework	• ICT is the main topic in a subject such as technology. • Students there acquire knowledge on the functioning of technology, skills on useful applications, ICT enabled problem solving and competences for evaluating and critically reflecting on existing implementations, their risks and impact on individual and societal developments.	• As e-content, designed to substitute or enrich the textbook or other learning materials. • As a tool for communication or collaboration, designed to generate, exchange and distribute ideas and content between teachers and students e.g. discussion forum, chat room, wiki).

		• As a problem-solving tool, designed to retrieve, organize and process up-to-date information for solving problems (e.g. drawing on internet-sites or data-bases).

Computer technology is a means of achieving a higher quality of education and is a way to move the education system toward student-centered approach. That is the goal of integrating computer technology into the education system in Palestine.

5.2.4 Operational Component of PEI:

Because the PEI goals aligns to EDSP goals, it is considered as a platform for building pilot practices based on contemporary best practices and fits to the Palestinian education system. As such the PEI would not responsible of large scale or nation-wide deployment of successful PEI pilots. The Palestinian MoEHE is responsible of those nationwide deployments.

The initiative indicated several methods that will be used to achieve the above-mentioned goals and objectives. Those methods are laid out in subgroups, each of which tries to achieve a certain goal. I will try here to summarize the methods that were mentioned in the PEI operational text. The full description of the first three tracks that deals with the teaching and learning process will be found in appendix J.

Track one identifies three actions the Ministry needs to take to improve education in Palestine, starting with curriculum development. It recommends starting with Science, Math, and Arabic classes because there is considerable to material to build on in these subjects and they are relevant to large-scale international assessments. The second area of action in the first track relates to aligning tests and assessments with learning goals and objectives of MoEHE and the standard of international assessments. And the last action area refers to developing material for the selected subjects like lesson plans, media, and assignments.

Track two looks at how to develop competency in teachers, administrators, principals, supervisors, and decision-makers within the education system. This starts by developing and implementing a coherent training program for master trainers, then to teachers, and then to principals, supervisors and decision makers.

Track three is designed to promote ICT for educational literacy for priority groups, upgrade the ICT infrastructure in terms of equipment and maintenance facilities, and provide an ICT-friendly environment in terms of software systems and tools.

As the first section helped us understand the first step in recognizing computer integration into Palestinian schools, the next section will take us to the ground level and help us understand how teachers believe, use, and support the integration of computer technology into the teaching and learning process.

5.2.5 New Partnerships for Education

A partnership for education is a new idea in the PEI focus. It is based on the experiences of the Global Education Initiative along with UNESCO in which calls for multi-stakeholder partnership as a means for promoting educational objectives.

Multi-stakeholder partnerships are defined by the PEI as the pooling and managing of resources, as well as the mobilization of competences and commitments by public, business and civil society partners to contribute to the expansion and quality of education. The potential of multi-stakeholder partnerships, as pointed out in the PEI, is the mobilization of resources such as money and expertise to meet the needs of people. The second chapter will further explore the concept of multi-stakeholders and how the MoE bans schools from including Internet connectivity in schools budgets. Instead they need to seek donations from the public or local NGOs.

5.2.6 Finding Interpretation

Based on my connections to the Palestinian school systems, as well as the policy elements defined in Pal (2010), I can say that the PEI provides a clear description of the problems

in the Palestinian education system and distinct list of goals and objectives that will help in improving the quality of teaching and learning process. On the other hand, I see that the PEI stated the general strategic process but lacked the detailed process of achieving those goals. Operational policy frame in any strategic plan according to Kozma (2008) is an action plan that consists of a list of programs or projects that will be used to achieve those goals. PEI for example stated that one of its objectives was training teachers, but it did not indicate the technology skills that teachers should acquire in order to help them integrate computer technology; it did not indicate the minimum skills they looking for teachers to get, which will help in training workshops organization. Another objective stated improving computer technology structure, but did not state the type and number of computers they are hoping to equip schools with. I think this generality will create some misunderstanding and confusion among the stakeholders which will be explored later on this chapter.

One of policy makers indicated the ambiguity of the PEI which supports my earlier argument. The policy maker said "As I am now…and I was involved in the initiative, the vision is not clear to me and not clear to one who works as…decision maker." And then she/he added "Read it, you will not reach a point where you can say from here I started and there I will reach to start a new stage. The process is not clear in it."

PEI is built on a public-private partnership with cooperation from all the different stakeholders. Keeping open communication and a strong connection between the stakeholders requires a good deal of effort. However, interviews with supervisors and teachers indicate that the PEI is not shared by all teachers and supervisors. The mixed results of these interviews support this idea and will be presented in the second section of the chapter.

The PEI specified that computer technology has become a separate subject of its own in which students learn how to use various computer programs. Consequently the MoEHE introduced technology classes in grades five through ten (Wahbeh, 2006). Due

to the introduction of technology as a subject, the ministry stated it would build computer labs in schools that house grade five or older.

Another interpretive finding worth noting here is that PEI goals as highlighted in the document is to improve the quality of education and shift the education system toward student- centered learning, in addition to aligning tests and assignment and the learning objectives with the standards of international assessment. This alignment makes tells me that either MoEHE assumes that international tests like TIMMS and PISA focus on assessing the quality of teaching and learning, or else it becomes unclear the goal of improving the teaching and learning process.

As indicated in the PEI, the teaching and learning process in Palestinian schools follows the traditional approach, and curricula should be amended to require higher order thinking skills. The first track of the PEI shows some activities that can be done to improve the curricula to help facilitate that shift. The Ministry has done some curriculum improvement and revision as was emphasized by Shinn (2012), but it is not clear what kind of changes and improvments the ministry has made taking into consideration the loaded textbooks of information, and the summative assessment that teachers use.

 PEI is considered a pilot platform for building best practices on a smaller scale and is not considered a model for large-scale or nation-wide deployment. The UNESCO framework as it is described above in Figure 2 showed us that planning for effective computer integration requires the development of all inputs in the framework. The PEI will be working on a small scale, meaning that it will improve some inputs of the framework. In terms of small scale improvement, PEI can work on building the ICT facilities and training teachers. It will be difficult, however, to work on curriculum

development on the small scale and improve student evaluations within the centralized and standardized education system.

The notion of small-large scale point was raised by Shinn (2012) when he talked in his study about teacher education reform in Palestine from donor's percpective. He argued that the "absence of an overall vison and detailed policy integrating and aligining teacher education reforms within a framework for of large-scale improvement remains a major impediment to the success of the strategy" (p. 624). He stated it was also an impediment to "improving the quality of instruction for all Palestinian teachers" (p. 608).

If the situation stays as it is without the intention of developing those small scale interventions into large scale, I think computer integration into Palestinian schools will be impeded.

5.2.7 Concluding Summary

As was indicated in the PEI, computer technology is considered to be one of the main means of achieving a higher quality of education in Palestinian schools and a way to move the education system toward a student-centered approach. The MoEHE through PEI has identified three roles of computer technology in the teaching and learning process; it is considered as administrative tool, as a learning content, and as learning resource.

The initiative has mentioned several methods of achieving its goals and objectives. Although these methods were laid out in several tracks, those means are very general and do not specify the details of how each method will be employed.

In the first section of this chapter, I talked about the initial stepping stone in recognizing computer integration into Palestinian schools. In the next section of this chapter, it will take us to the ground level of the Palestinian education system and help us understand how teachers believe, use, and supported to integrate computer technology into teaching and learning process.

5.3 Computer Integration into Schools

This second section in this chapter focuses on computer technology integration into Palestinian secondary schools and how teachers use technology in the teaching process. This section will discuss teachers' attitudes toward the use of computer technology, challenges in integrating computer technology, and the support systems that are in place to help make technology integration successful. Table 16 states the research questions and the tools used to answer them.

Table 16: Research Questions and Tools

What are teachers' experiences of computer integration?					
Supporting questions	Research Employed Tools				
	Questionnaire	Teacher Interviews	Supervisor Interviews	Policy-makers Interviews	Document Analysis/ Literature
Do teachers have access to computer technology?	X	X	X		
How do teachers talk about computer use in the classroom, and what are the reasons for using computers in the classroom?		X			PowerPoint [10]
What are teachers' pedagogical beliefs and attitudes toward integrating computers into their teaching?	X	X	X		
How well do teachers feel they are prepared to integrate computers into their instruction?	X	X			
What factors influence how Palestinian public secondary school teachers integrate computer technology into their teaching?	X	X	X	X	
What are the barriers that prevent teachers from using computers into their	X	X	X	X	

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[10] Power Points refer to Power Point presentations that I was able to collect during my data collection from the teachers. Some of the power points were done by teachers, the others by students.

instruction?					
How does the Palestinian MoEHE view the use of computer technology in the classroom?					
How well does the MoEHE policy match teachers' teaching practices				X	X
What kind of support does the MoEHE provide to help teachers integrate computers effectively into education?	X	X	X	X	X
What strategies does the MoEHE use to integrate computers into education?			X	X	X
What are the possible strategies that help integrate computer technology effectively into schools?					
What is the gap between the PEI Initiative's goals about technology integration and the current situation in schools?	X	X	X	X	X
What is known in the literature about effective computer technology integration?					X

A mixed method research design was used to collect data from teachers to help achieve the second part of the study. A questionnaire was distributed to 364 secondary teachers to explore their beliefs and attitudes, describe the resources that teachers have to help them integrate computer technology into the classroom, and identify teachers' competency levels when using computer technology. To get a greater understanding of this, the researcher interviewed 24 teachers from six main subjects taught in Palestinian secondary schools. 12 of the interviews were conducted with teachers who integrate computer technology into their teaching and 12 interviews were with teachers who do not integrate computer technology. Table 17 lists the participants with pseudonyms.

Table 17: Participants' Teachers List

Teacher	Teaching Experience	Specification
Ms. Suha	15 years	Qal. Arabic teacher USE
Ms. Mai	13-14 years	Qal Arabic teacher Not USE
Ms. Nahid	13 years	Qal. Islamic Education teacher USE
Mr. Ibrahim	10 years	Qal. Islamic Education teacher Not USE
Ms. Jihad	20-22 years	Qal. English teacher USE
Ms. Amal	29 years	Qal. English teacher Not USE
Mr. Kamal	20 years	Qal. English teacher Not USE
Ms. Aya	17 years	Qal. Math teacher USE
Ms. Hanan	27 years	Qal. Math teacher Not USE
Mr. Khalid	6 years	Qal. Science teacher USE
Mr. Qais	5 years	Qal. Science teacher Not USE
Mr. Maher	Refused to say	Qal. Social Studies teacher Not USE
Mr. Jameel	8 years	Qal. Social Studies teacher USE
Ms. Hiba	9 years	Ram. Social Studies teacher USE
Ms. Issra	10 years	Ram. Social Studies teacher Not USE
Ms. Iman	12 years	Ram. Science teacher USE
Ms. Sana	13 years	Ram. Science teacher Not USE
Ms. Riham	25 years	Ram. Math teacher USE
Ms. Khitam	15 years	Ram. Math teacher Not USE
Ms. Rana	7 years	Ram. Math teacher Not USE
Ms. Ola	15 years	Ram. English teacher USE
Ms. Maggie	19 years	Ram. English teacher Not USE
Mr. Abed	7 years	Ram. Arabic teacher USE
Mr. Wael	3 years	Ram. Arabic teacher Not USE
Mr Mohamad	11 years	Ram. Islamic Education teacher USE
Ms. Amani	4 years	Ram. Islamic Education teacher Not USE

A questionnaire was distributed to 364 teachers at the Ramallah& Al Birih and Qalqilia & Azoon secondary schools in Palestine. 293 questionnaires were returned and the results of the quantitative data are based on those returned questionnaires. As shown in the table below, more than 43% of the teachers were male and 56.7% were female. The average age of the teachers was 36 years old. The table details the participating teachers' demographic information. The majority of the teachers (57.1%) indicated that the teachers had 10+ years teaching experience. The majority of the teachers who took part in the study also have B.A in their subject.

Table 18: Participants' Backgrounds

Variable	Category	Frequency	Percent
Gender	Male	123	43.3
	Female	161	56.7
Age	20-24	15	5.8
	25-29	56	21.8
	30-34	51	19.8
	35-39	44	17.1
	40-44	37	14.4
	45-49	29	11.3
	50-54	19	7.4
	55-59	6	2.3
Teaching experience	1-5 Little experience	81	28
	6-9 Some experience	43	14.9
	10+ Experienced	165	57.1
Education Level	Diploma	30	10.6
	B.A	227	80.5
	Master or above	25	8.9

Supervisors play a very important role in the teaching and learning process in Palestinian schools, they are the linkage between officials at the Ministry, the educational directorates, and

teachers in the field. 12 supervisors from the Qalqila and Ramallah education directorates were interviewed. They were an excellent source of information in the study, and will be referred to throughout the presentation of the findings.

This section names some of the emerging themes that came up in the study and then connects those themes to the PEI, backing it up with evidence from the literature. Access is one of the well-presented themes in the findings. It refers to the resources that teachers have that relate to computer technology.

Pedagogy is another theme that I will cover in the chapter, referring to how teachers describe some of their teaching practices while using computer technology. Then teachers' views of computer technology integration as indicated by teachers was also covered in this section and ended with some of the factors that hinder computer integration into Palestinian schools. Another theme of the findings was computer technology and the language of the new generation. This reflects teachers' attitudes and beliefs about computer technology in general and about its integration into the classroom in particular.

Policy and leadership is another emerging theme that came from supervisors and teachers' interviews. It refers to having a policy for computer integration, support that teachers get from the ministry, supervisors and colleagues

The discussion of findings will be connected to the other elements of digital inequality that Hargittai, 2003; Warschauer, 2004; Wilson, 2004 talked about in the litreature.

5.3.1 Access vs. Digital Inequality

Access was one of the most common themes that emerged in interviews with the teachers and supervisors. Teachers and supervisors indicated that there are no computers in classrooms, computers are located in computer labs and some schools got a computer and LCD at the library for teachers to use. The number and the efficiency of computers in computer labs vary from school to school.

No, there is no computer in the classroom. You can find in some schools a computer in the school library, or in science lab, but not in the classrooms. When the Arabic, science, Geography, or other teachers want to use computer technology during their periods and the computer lab is occupied or reserved for technology subject, they can use the computers in other locations. (Science supervisor).	"لأ، في الغرف الصفية ما في .اذا في حواسيب زيادة في مختبر الحاسوب بتلاقي في المكتبة او في المختبر بتلاقي في بعض المدارس مش كل المدارس .للمكتبة فعلا اذا معلم اللغة العربية بدو يعطي درس بالعربي او معلم العلوم او معلم الجغرافيا طب مختبر الحاسوب مهو محجوز مع أستاذه بإمكانك تجيب طلابك عالمختبر او المكتبة، اما انك تلاقي في الغرف الصفية لحد الان مصادفتش ولا مدرسة." مشرف علوم
Computer labs become very important in schools; most of schools in Ramallah district have computers, computer labs in general vary from one school to another. No schools are without a computer lab. He elaborated on what he meant by variation by saying that variations in quantities and in computer efficiency; there are computers that are new and others are old (Science supervisor).	"اصبح المختبر الحاسوب مهم جدا يعني ركن اساسي في المدارس بحيث انه معظم المدارس اللي في لواء رام الله تحتوي على الحواسيب وبشكل عام هذه المختبرات بتتفاوت من مدرسة الى مدرسة بس لا تخلو مدرسة من مختبر حاسوب. الباحثة :عدد الكمبيوترات متفاوت؟ المشرف:نعم متفاوت وصلاحيتهم متفاوتة يعني في كمبيوترات صالحة جيدة حديثة وفي كمبيوترات موديل قديم ممكن" مشرف علوم

The technology subject teacher is the responsible of the computer lab and teachers have to coordinate with that teacher if they want to use the computer lab. The technology subject teacher is mostly present in the room with the main subject teacher to help run the computers and advise the other teachers. However, most of the time the computer lab is occupied and used by technology subject students. Some teachers have alternative methods of using computer, such as at the library or science lab.

To help students acquire the skills and knowledge of the functioning of computer technology as a "learning content," Palestinian MoEHE is outfitting schools with computer labs. Teachers and supervisors emphasized that the number of computer labs in schools has increased in recent years. This was also documented in Palestinian Central Bureau of Statistics, 2010. The table below documents that improvement in terms of increasing the number of computer labs over the years.

Table 19 : The Increase Number of Computer Labs over the Years

Supervising Authority	Year		
	2005/2006	2006/2007	2007/2008
Government	56.7	92.9	95.6
UNRWA	27.2	92.0	90.9
Private	67.3	91.7	90.3
Total	54.3	92.6	94.4

Source: Palestinian Central Bureau of Statistics, 2010

Funding is another important aspect that relate to access to computer technology. During my school visits to interview teachers, there were some schools that were privileged to have some laptops that they got through participating in projects or sought support from local donors or non-governmental organizations-NGOs. So school teachers and principals have to look for outside funds to equip their schools with computer hardware and software. In one of the interviews, the English subject teacher indicated that in addition to the computer lab, they have language lab at the school that has 9 computers. This was due to the effort that is paid by her and the principal to get fund from the British Council.

That example showed that having more resources and equipment in schools relies heavily on the principals' efforts in looking for options and donors. This is also true of the issue of the Internet connectivity. Overall teachers and supervisors from the interviews confirmed that schools lack Internet connectivity; school principals should rely on external funding or donors to help them pay the connection fees. Teachers narrated stories about the Internet connectivity issue and each has its own description, I will present a story from one school in Qalqilia. It started when I asked Ms Mai if the computer in the teachers' room is connected to the Internet:

No, last year the computers in our room and principal room had Internet connectivity, and then the Ministry itself prevented schools from getting the connection. Until now we don't know the reason for that although it was connected at the expense of the Municipality. After that schools started to get Connectivity from their expense, meaning teachers prescribe and pay the	لا ,كان في العام الماضي مشبوك في غرفتنا وفي الإدارة ,بعدين ما بنعرف , الوزارة نفسها اللي منعت إرتباط المدارس , مع انه كان على حساب البلدية ,ما بنعرف لغاية الان الوزارة ليش منعته ,فصاروا المدارس على حسابهم يعني المعلمين يعملوا اشتراك ويعملوه على حسابهم ,إذا في عدد مليح بدهم يكون في انترنت في

net fees from their expense. The idea was offered to our school, if there were good number of teachers who agreed to pay, we would have got it. But teachers said that they got the connectivity at their home and they don't want the internet connection. The school principal got the Internet for her own room	المدرسة على حسابنا واحنا بنعمل, اقترحوا الفكرة لنا ما كان في عدد كافي ,قالوا المعلمات في فبيوتنا ما بيلزمنا في المدرسة ,المديرة شبكت الها

And for the Internet connection in computer lab, she continued saying:

No, it used to be, and was under the computer subject teacher supervision. It was operated really well; students used to go there during recess time and the computer subject teacher used to be there too, it was called Computer Club. So students used the Internet and searched for topics and used to have CDs and USBs and students get whatever they want and that was all done under the supervision of computer subject. Truly the computer center was really effective.	لأ ما في إنترنت كان موجود وبمراقبة من معلمة الحاسوب وكان في شبكة تربط كل الحواسيب .وكان مفعل في الحقيقة ,كان في بنات يجووا في الفرصة ومعلمة الحاسوب تداوم في الفرصة بسموه نادي الحاسوب.فكانوا يأتوا ويدخلوا على الانترنت تحت اشراف المدرسة . يعني ما بتسمح لهم يدخلوا على اي موقع , يعني ويسحبوا اللي بدهم اياه . الحق انه USB هم بطولوا مواضيع بيعملوا لحالهم ,وكان معهم سيد يهات ومعهم كان مفعل مركز الحاسوب

Ms. Mai's story is similar to other teachers' stories with small variations in the details. Throughout my schools' visits during teachers' interviews, there were only three schools that were connected to the Internet, two schools got the Internet from community donations and the other one got the connection from neighboring training center. The issue of the internet connectivity and schools have to seek the donations from local communities is way to implement the idea of multi-stakeholders that was talked about earlier in the policy discussion section.

During the interviews with policy makers, I had the chance to talk with them about the issue with the Internet connectivity. One of the policy makers supported the idea of the multi-stakeholders partnership that was presented in PEI section.

This is one of the issues that are introduced on the national level. We think that is not the responsibility of the MoEHE. We believe it is the responsibility of the Ministry of Communications and Information Technology in collaboration with the private sector and with the collaboration with the Internet providers. They	هذا واحد من القضايا اللي مطروحة على المستوى الوطني هذه مش مسؤولية وزارة التربية والتعليم احنا بنعتقد، هذه مسؤولية وزارة الاتصالات وتكنولوجيا المعلومات بالتعاون مع القطاع الخاص مع مجموعة الاتصالات مع اي Internet provider، يجب ان يتوفر هذه الامكانيات بشكل اسهل

should provide this access [to technology] more easily and inexpensively to the people. After the Internet is connected or reached the schools' doors, it is our responsibility to makes sure the school is a Wireless Environment, this helps teachers use technology more easily. For this topic, we are in continuous partnership and discussion with the Ministry of Communication and information technology.	وبشكل رخيص وبشكل مش مرهق وبالتالي بعد ما تصل لباب المدرسة، احنا دورنا انه المدرسة تكون Wireless Environment بحيث انه المعلم يتمكن من انه يستخدم التكنولوجيا بشكل سهل، وبالتالي احنا في شراكة او في نقاش بينعمل مع وزارة الاتصالات وتكنولوجيا المعلومات في هذا الموضوع

The quantitative results supported the results of the interviews and my school visits. In the questionnaire that was distributed to teachers, teachers were asked to fill out two questions that related to computer access in section F and G of the questionnaire. The first question of section F requires participants to answer yes/ no statements in order to assess the availability of computer lab in school. The results of this section are presented below:

Table 20: Frequency of Computer Labs

Does your school have a computer lab?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	267	91.1	98.2	98.2
	No	5	1.7	1.8	100.0
	Total	272	92.8	100.0	
Missing	System	21	7.2		
Total		293	100.0		

If the answer to the previous question was yes, teachers needed to mark whether the computer lab was connected to the Internet. The table below shows the teachers' responses.

Table 21: Frequency of the Internet Connectivity at schools

If the answer is yes to C180, are they connected to Internet?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	81	30.3	32.1	32.1
	No	171	64.0	67.9	100.0
	Total	252	94.4	100.0	
Missing	System	15	5.6		
Total		267	100.0		

The table above shows that 272 teachers answered the question. 267 teachers confirmed that they have computer labs in school and 5 teachers said they didn't. 64% (n=171) stated their school computer labs are have no Internet connectivity. This means out of 252 teachers who answered the questionnaire, only 81 teachers confirmed that their computer labs are connected to the Internet.

The G questions basically ask teachers to identify the frequency that computer technology is available to them in different settings like school, home, etc. The table below shows the distribution of responses on computer access:

Distribution of Responces Percentage on Computer Access

	daily	2-3 times in a week	once in a week	once in a month	never
■ At home	53.2	14.2	12.1	9.6	11
■ At school	27.7	20.5	13.7	19.1	19.1
■ Other places	8.7	5.4	7.2	7.2	71.5
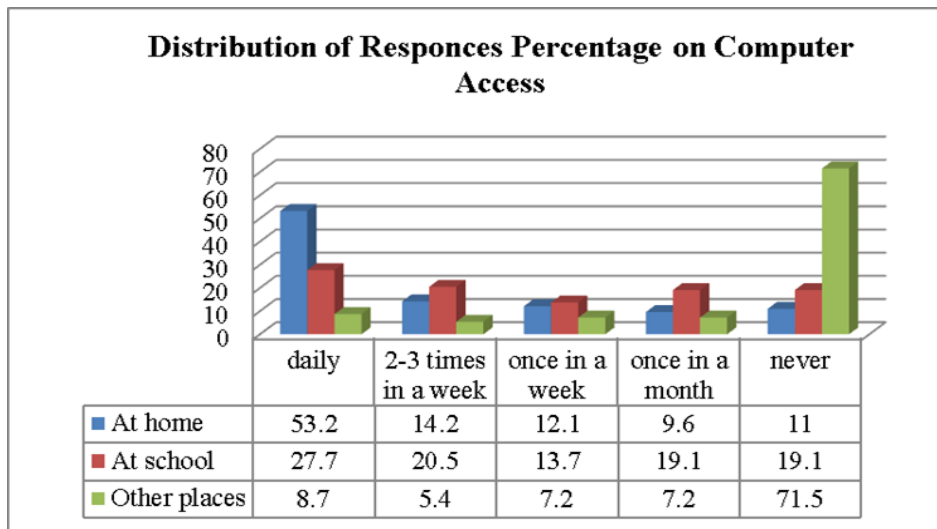
Figure 8: Distribution of Responses Percentage on Computer Access

Other places — 29%
In school — 81%
At home — 89%

■ They have
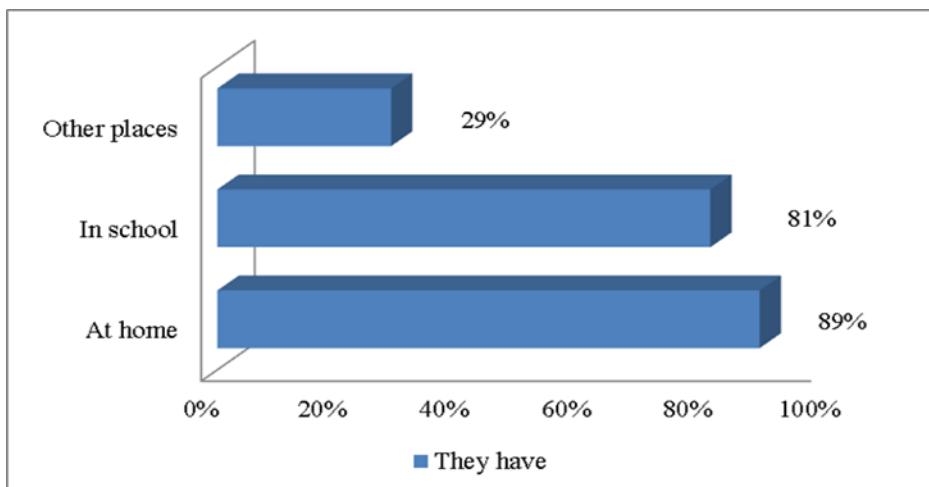
Teachers reported that outside of school, they most frequently used computer technology in their homes, with 89% of respondents who have access to computer technology either daily (53.2%), two or three times a week (14.2%), once a week (12.1%), and once a month (9.6%). Schools were the second place where 81% of teachers have access to computers. 29% of the teachers have access to computer in other places like Internet cafes or so on.

Wahbeh, (2006) found a lack of resources was one of the biggest challenges to integrating technology into the Palestinian education system. This is because Palestine depends on international and national donors for building computer labs and connecting those labs to the Internet. Locating donors to help finance Internet connectivity was a major issue in Wahbeh's (2006) study and still a major issue in this study.

As was discussed in the literature chapter, this policy makes it very hard on teachers to have the environment that will support them to use computer technology effectively. Simply installing computers into schools is not enough; without access to the internet, students and teachers will not receive the full benefit of computer technology integration, especially according to the student-centered perspective. I think this decision will reinforce the digital inequality between schools that Hargittai (2003) referred to in the literature, because it means that schools' access to the Internet will be dependent on outside efforts by the schools' administrators. For example, school principals who have a good connection with the local community are more likely to be able to generate the funds for the Internet connections, and their students will benefit from that privilege. Schools whose principals do not have strong connections to the community and are not able to locate funds to set up internet connectivity will be at a disadvantage and will not be able to offer the same quality of education.

I have noticed during school visits that some teachers were integrating computer technology very effectively the three schools in Ramalla, Al- Birah & Qalqilia, Azzon that have the Internet connectivity. On the other hand, in schools that do not have Internet access,

116

teachers rely heavily on PowerPoint presentations and CDs. More of this point will be discussed in next theme: "pedagogy".

Connecting the access finding theme to what was said about access in the literature and in UNESCO framework for effective computer integration, we see that it was evident in the literature that the MoEHE spent a good deal of effort on building computer technology infrastructure and increasing access to computer technology, Table 1showed us earlier that development, but it appears that development is not enough. Teachers and supervisors indicated throughout the interviews that the lack of computer technology in the schools' infrastructure started with not having computers in the classroom, a limited number of PCs in computer labs, and a lack of computers for teachers to use. Teachers stated that one computer for 25-35 teachers is not enough for them.

I found also how quantitative results echoed teachers and supervisors' interview results in pinpointing that teachers have access to computer at homes more than schools. Using it more at home than in schools denotes the way teachers use computer technology, which is in a non-instructional way. This finding also supports the notion that computer technology use is mostly used to reinforce the traditional way of teaching.

5.3.2 Pedagogy

Pedagogy is another emerging theme that I would like to talk about, especially in that it is affected by the "access" emerging theme. Pedagogy refers to the teaching and learning practices that are used by teachers and students, as described by the teachers in the interviews. For this theme, I am relying more on the data that I got from teachers, supervisors' interviews and some of the PowerPoint presentations that teachers gave me, since I was not able to have classroom observations due to time constraints.

Teachers and supervisors' interviews revealed that all teachers use computer technology for administrative purposes like writing worksheets, exams, papers, and especially for the midterm and final exams. Teachers also use computer technology to write their yearly lesson

117

plans, and students' final grades and transcripts. Supervisors indicated that they ask teachers to do the lesson plans and the final grades on computer and the supervisors check that when they come and visit teachers in the schools. Supervisors provide the support to teachers to help them do it and teachers also indicated that they get the support from other colleagues and technology subject teacher. There were "Intel" training workshops that were conducted during my data collection time to help teachers use computer technology in exams and work sheets production according to Science supervisor. I will talk more about that in support theme.

Teachers who were identified as "computer users" indicated that they mostly use computer technology as a presentation tool. Most teachers rely heavily on PowerPoint presentations to present new information, clarify some abstract concepts, or show solutions to problem. Teachers may also use CDs as a presentation tool to demonstrate abstract information or topics like in Science, religion, or social studies.

Teachers who had access to the Internet used computer technology to present animations, show videos, and search for extra information. Some teachers also created blogs and websites to enrich the topics and help students stay connected to the learning material. For example, an Arabic teacher in one of the schools indicated that she uses the blog to post all lesson explanations and poems analysis, which helps the absent students stay in touch with what they missed.

Teachers who have the privilege of Internet connectivity also stated that they use emails to communicate with their students and supervisors. There was an interesting example that Ms. Aya -the math teacher- talked about which relates to using it as a communication tool with the students:

Last year I used email as a communication tool between teachers and the senior students[11]. I gave	وأنا العام الماضي فتحت الايميل وسيلة تواصل بيننا وبين البنات التوجيهي

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[11] Senior high school students finish their school year one month ahead of other students. This helps them prepare for the final national unified comprehensive exam (Tawjihi exams)

them the school email at the end of the school year so they can send me emails if they got questions in any subject material. It worked with many students and there was good interaction last year. The problem was with the Internet connection, there was no Internet connection in the school, so I used my home internet connection and my personal computer for that; I was opening the email from my home, communicating with the students from my home. I used the flash memory to save students' questions and give them to teachers. Teachers then answered students' questions gave them back to me so I send them to students. It was a long process so I told students to give me a day or two to get back to them.	فأعطيتهم الايميل الخاص بالمدرسة نهاية السنة العام الماضي وحكيتلهم أي بنت عندها سؤال في أي مادة توديه على الايميل وأنا بوديلها الجواب على الايميل ,وعملته ومشى مع بنات كثير كان تفاعل العام الماضي بس المشكله يا كفاح ما في نت في المدرسة ,فانا لما عملت الايميل عملته من دارنا ,بفتح عليه من داري بتفاعل مع البنات من داري فانا كنت افتح وأجيب فلاشه وأعطيه للمعلمة تجاوبني اياهم وارد اطبعهم للبنت في الدار وأوديهم للبنت على الايميل ,بجور هي كانت شويه طويلة ,كنت احكيلهم اعطوني فرقيه يوم مشان أرد عليك

Almost all the teachers (users and non- users) and the supervisors highlighted the point that teachers who have access to the internet, use computer technology for informal professional development. They search for information and exchange ideas and exams, papers, and worksheets with other teachers in different education directorate. They may also look for other sources or ideas to use it in their teaching or writing exam questions & worksheets.

The English teacher I mentioned earlier, who has the language computer lab, presented another good example of how she could with the help of the Internet encourage students to use computer technology:

This year, and after searching the net, I recognized that we can computerize 11th grade curriculum. This is their first opportunity in doing that, so every 6 students work together to computerize or digitalize one unit. In 11th grade, we have interesting topics like the Bermuda triangle; we also have topics about water, including the shortage and shrinking of water supplies.	"السنة هاي دخلت على أساس اطلعت على النت ممكن نعمل برمجة للمنهاج بنات صف 11كانت اول فرصة الهم انهم في كل مجموعة بنات 6, بنات حوسبة لوحدة كاملة .مثلا عنا مواضيع شيقة لصف 11 عنا عن مثلث برمودا في عنا عن الإنترنت ,وعنا عن المياه وقلة المياه وانحسار البحر ....الخ .فكل مجموعة من الطالبات عملت عرض ورحنا على غرفة الحاسوب . ولما أجى المشرف حضر برضه حصة وكانت محوسبة وكتير عجبته"

For classroom organization during students' presentation, Ms. Ola went on to say:

Students who are presenting take in charge of the computer and the rest set on the carpeted floor in U shape. The girls have 30 minutes of presentation and leave 10 minutes for discussion with all classroom	'' هلأ البنات الي بدهم يعملوا ال presentation هن اللي بيمسكوا الكمبيوتر والباقي بيقعدوا على الأرض في النص وعندنا موكيت ومريح يعني.و بيقعدوا على شكل U هسه دايما البنات بيعملوا ال presentation على الأجهزه خلال 30 دقيقه وعشر دقائق بنعمل discussion فيهم بيشاركوا

119

| students. | "فيها كل البنات وبصير نقاش ما بين الجميع |

And on her role as a teacher during the presentation, Ms. Ola added:

| Classrooms [during students' presentations] were only for using computers; my role was watching and providing comments. I had explained and presented the unit for two weeks and now students' presentations are to emphasize on certain concepts and information in a new way of presentation. | "هذا الدرس بكون للحاسوب وأنا يعني بس بعمل comments على بعض الشغلات والبنات هم اللي بيد يروا الحصة في حصة الحاسوب . لأني أنا بكون شارحه الوحدة خلال اسبوعين وكأناعن طريق البرنامج . بتكون هذه عبارة عن ترسيخ معلومات ومفاهيم معينة مع back up بنعمل عليها عرض جديد للطالبات |
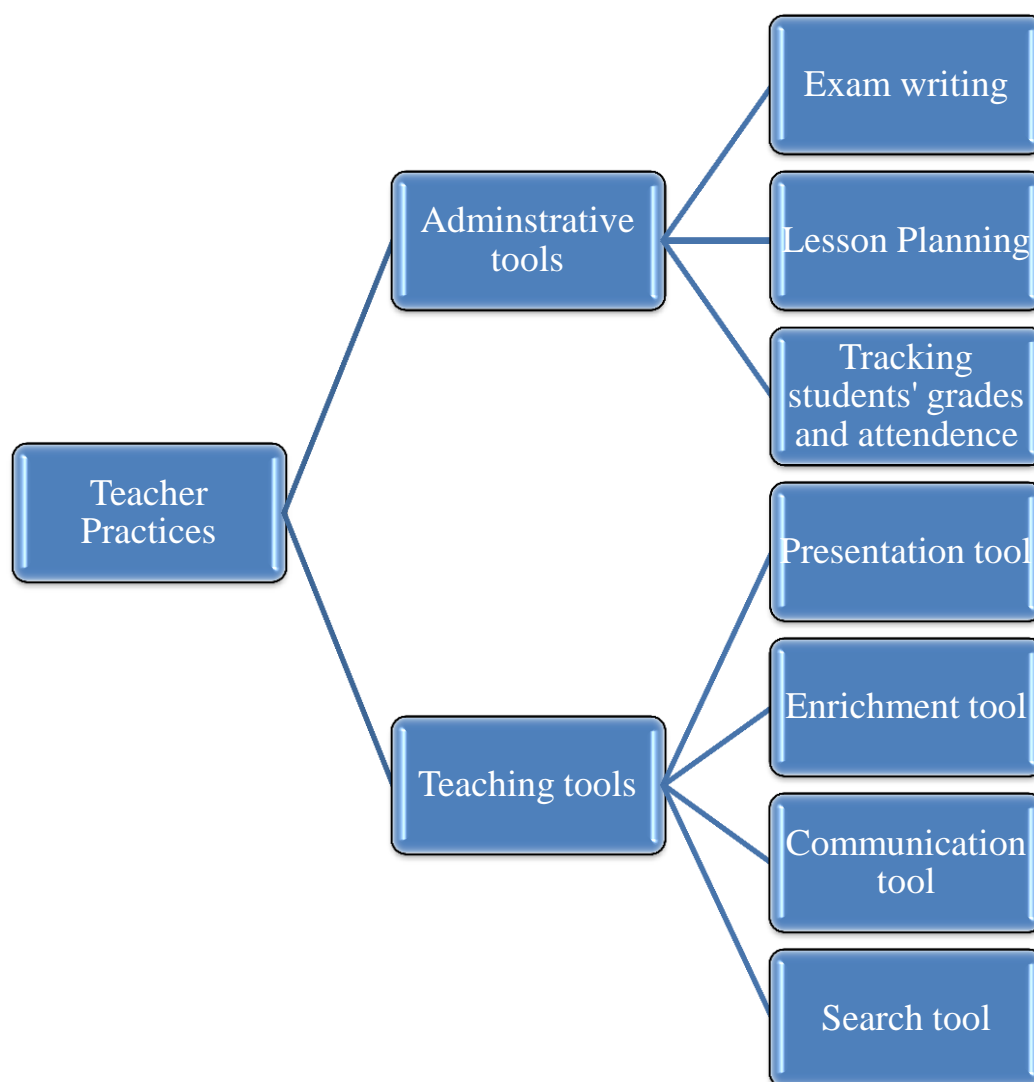
Figure 9: Teachers' Computer Practices

As was indicated in the PEI, students take technology classes from grades 5th -10th.

Teachers made the point that students, with help from the technology subject teacher, apply the

skills they learn in the technology subject class when designing materials for other subjects. Students' practices using computer technology ranged from searching the Internet to enrich the learning topic, to designing Power Point presentations. For the Power Point presentations students either present the PowerPoint in groups as was seen in Ms. Ola's example or give the presentation to the teachers to present in classrooms.

The diagram shows that teachers mostly use computer technology as an administrative and teaching tool. Those are the other roles of computer technology in Palestinian education process as indicated in PEI; those practices will not help improve the quality of teaching and move toward student-centered learning.

Almost all teachers indicated that they use computer technology as administrative tool, but very few used it as a teaching tool. The reason that all teachers use computer technology as administrative tool is because it is required for them to use it for that purpose. Supervisors also revealed that their support mostly focusing on that direction.

| In supervision, we are working 3- 4 aspects and check if they done using computer technology. The first aspect is to looking at the worksheet, exam papers, and the full annual students' grades. If their school got electricity or computers, then they are obliged to do it electronically. | في عنا احنا بنشتغل بمحاور 3 او 4، المحور الاول اللي هو الاطلاع اوراق العمل اللي تم تنفيذها، هل كان التوجه اليكترونيا . بسأل الاستاذ السؤال التالي: هل اوراق العمل ورقية أم اليكترونية هل الحاسوب النقطة الثالثة والاخيرة عمل في اعداد الاسئلة، اسئلتك مطبوعة عالحاسوب والا مكتوبة يدويا؟ هذه نقطة مهمة بنوخذها بعين الاعتبار . النقطة الرابعة اللي هي جدولك السنوي، هل تعده عالحاسوبو ام تعده يدويا؟ لانه الاربعة هذول انا بطلبهم اليكترونيا، اذا كان في فالمدرسة حواسيب وفي عنا كهرباء، وامكانيات المدرسة تتيح لي اسأل كل شيء، بقوله لماذا اسئلتك غيرمطبوعة؟ جدولك لماذا جاء يدويا، اوراقك المل اراها مكتوبة كتابة |

The Palestinian MoEHE recently released a 2011 annual monitoring and evaluation report on the Strategic Plan 2008-2012. We saw earlier that the PEI's ultimate goal is to contribute to the overall objectives of Education Development Strategic Plan 2008-2012 EDSP for improving the quality of education in Palestine. One of the goals of the report is to identify the extent that computer labs are used in education. The results of the report show that 41% of students use computer labs for an average of 15.8 minutes during the 40 minute computer subject

class period. The per capita usage time was 2.9 minutes. This result is attributed to the fact that the number of valid computers is not appropriate to the number of students. In some schools there is no computer lab (MoEHE & Higher Education, 2011). The results also showed that 46.3% of the session period at the computer lab is for the teacher, and 13.6% is a lost time which the student loses during moving from the classroom to the computer lab and preparing the computers for the lesion (remove the covers, turn on and turn off computers).

The report's results described the point of access that was mentioned earlier and reflect on the theme of pedagogy by indicating that 46.3% of the class period is for teachers. On top of that, the results of the report showed us how computers are being used in the technology subject class periods. That description will help us imagining the access and the pedagogy of other subject classes considering the point that technology classes were given the priority in terms of access.

Using computer technology for administrative purposes does not require the same skills and resources as integrating computers into teaching. To use computer technology administratively requires basic technological skills and knowledge such as knowing the Microsoft Office desktop application, and most of the teachers already know those skills through the training that they are getting. Integrating computer technology into education on the other hand requires several instructional design skills and those skills are rarely found among Palestinian teachers.

Computer technology integration is part of the real interactions between teachers and students in classrooms. Nobody can judge what is happening behind the closed doors of classrooms unless they have been observed. Therefore computer use for administrative purposes is well-documented and easier to support than integrating computers into teaching. I think this is the reason supervisors focus on how computers are used for administrative support during their visits to teachers.

All teachers use computer technology for administrative purposes because they are required to do that while few teachers use it in teaching because it is left optional for them. I think this due to the authoritarian characteristics of Arabic society in general and of the Palestinian school structure in particular (Watfa, 1999, as cited in Assai, Amouri, Hashweh, & Baumgarten, 2006). As was indicated by UNDP Human Development Report (2002) and was cited by Assai, Amouri, Hashweh, & Baumgarten (2006) & Wahbeh (2003), Palestianin education is still marked by "authoritarianism" in a community controlled by "hierarchical" relationships and in which team relationships are still weak. The point of "authoritarianism" was disussed among the particpants in the study through asking them whether having clear. Supervisors and teachers had different opinions regarding the hierarchical structure of the schools; some supervisors and teachers (users and non-users) have indicated that having policies that force teachers to use computer technology in teaching are not effective. The use of computer technology in the classroom should instead be encouraged through indirect actions such as . Other supervisors and teachers, both computer users and non-users, also indicated that there should be a policy that obliges teachers to use computer technology in the classsroom. Ms. Hanan is one of those teachers. Ms. Hanan stated that she would integrate computer technology if there were a policy that obliged her to do so.

When discussing the use of policies to enforce computer use in the classrooms in the interviews, I used term "ijbar" in Arabic which is equivalnt to "force" in English. Some teachers and supervisors were not bothered by the use this term and agreed to the point that the "force" makes teachers use computer technology. Its possible that if I had used a less powerful word than force, more of the participants who preferred the use of indirect actions to encourage computer use would have been more amenable to the use of policies that enforce it. I do believe that the underlying understanding in both cases reflects the point of authoritarianism but the language palys role in making it not disctinct autheority weight.

123

5.3.3 Computer Technology Is the Language of New Generation

Teachers' interviews for users and non-users provided a clear understanding of the positive attitudes toward computer technology and integrating technology into education in general. The most frequently cited reason for those positive attitudes was that computer technology is the language of the new generation "لغة العصر" and it is has influence imposed on all aspects of our lives "فرض نفسه في كافة المجالات"

Some teachers did a good job explaining the various attributes of computer technology, which reflects the positive attitudes they have toward computer technology:

We live in a generation in which everyone is using computer technology. For example, dentists write their prescriptions on the computer, pharmacists save all kind of medicine on the computer. Wherever you go, everyone has computers. In the past at the library, we had a difficult time finding the necessary books. Now you can give the librarian the name of the book or the author, and he/she very easily can tell you where it is located. Of course, all of that thanks to the use of computer (Ms. Mai)	نحن في عصر الجميع بستخدمه [الكمبيوتر]بتروحي على طبيب الاسنان بكتب لك الروشيته على الحاسوب ,بتروحي على الصيدلية مخزن كل انواع الادوية على الحاسوب ,وين ما تذهبي الكل عنده ,المكتبة العامة ,كنا زمان نبحث عن اسم الكتاب ومشكلة تنوجد الكتاب في المكتبات العامة ,اليوم بنروح على امينه المكتب عاوز الكتاب كذا وكذا ,فقط اذكر لها عنوان الكتاب أو المؤلف بتخرج لي مكانه ,ورقم التسلسل في ثانية ,طبعا هذا كله بفضل استخدام الحاسوب ومجالاته الواسعة
In short, it is the language of this era. The second thing, it is entertaining, and it saves time. For example these days, if you do not have a video player, you just get a CD and I can watch anything from it. I can use CD as a teaching aid instead of crafting one by hand. The article has changed; defiantly computer saved and helped a lot in many things. (Mr. Abed)	لغة العصر باختصار ,ثاني اشي ممكن مسلي كمان مفيد مختصر للوقت، هاي هي يعني انت مثلا اليوم مثلا CDواحضر اي اشي بدي اياه مثلا، اعمل وسيلة تعليمية على ال CD معنديش فيديو بالبيت ممكن اجيببدال ما افعلها باشكال ثانية او عالايد يعني اختلفت الصورة بالنسبة لدور الكمبوتر، اكيد الكمبوتر وفر كثير وساعدنا في كثير اشياء

That positive attitude was reflected also in some of the actions that teachers use computer technology in their personal and social lives. For instance, some teachers used computer technology during their graduate studies and that made them familiar with computer technology how to use it in teaching. Teachers also indicated that they used computer technology for chatting with friends and family members, entertainment, reading the news, and to find recipes. That positive attitude toward technology is reflected in the questionnaire that was distributed to the

teachers. Table 22 below presents their responses to the set of question about their attitudes toward computer technology in general. We can see that 94.1% of teachers agree with the statement that "computers are a fast and efficient mean in getting information," and this supports what they have talked about earlier.

Table 22: Frequencies of Teachers' Attitudes toward Computer Technology in General

Attitudes toward computer technology in general	Agree	Neutral	Disagree
Computers do not scare me at all	85.3	10.5	4.2
Computers make me uncomfortable[12]	13	15.8	71.2
I am glad there are more computers these days	73.4	16.1	10.5
*I don't like talking with others about computers	17.5	32.5	50
Using computers is enjoyable	77.7	17	4.9
Computers save time and effort	86.7	6.3	7
*Learning about computers is a waste of time	4.6	13.3	82.1
Computers are fast and efficient mean in getting information	94.1	3.5	2.4
*Computers do more harm than good	7.4	36.1	56.5
I would rather do things with computers than by hands	61.5	21.7	16.8
*I would avoid computers as much as possible	8.1	22.9	69
I would like to learn more about computers	82.6	9.8	7.7
*I have no intention to use computers in the near future	9.5	14.5	76
I have no difficulty in understanding the basic functions of computers	39.1	32.7	28.2
People who are skilled in computers have privileges not available to others	62.9	29	8.1
*Computers encourage unethical practices	36.6	41.9	21.5

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[12] * Refers to reversed code items that are negatively worded so that a high value indicates the same type of response on every item.
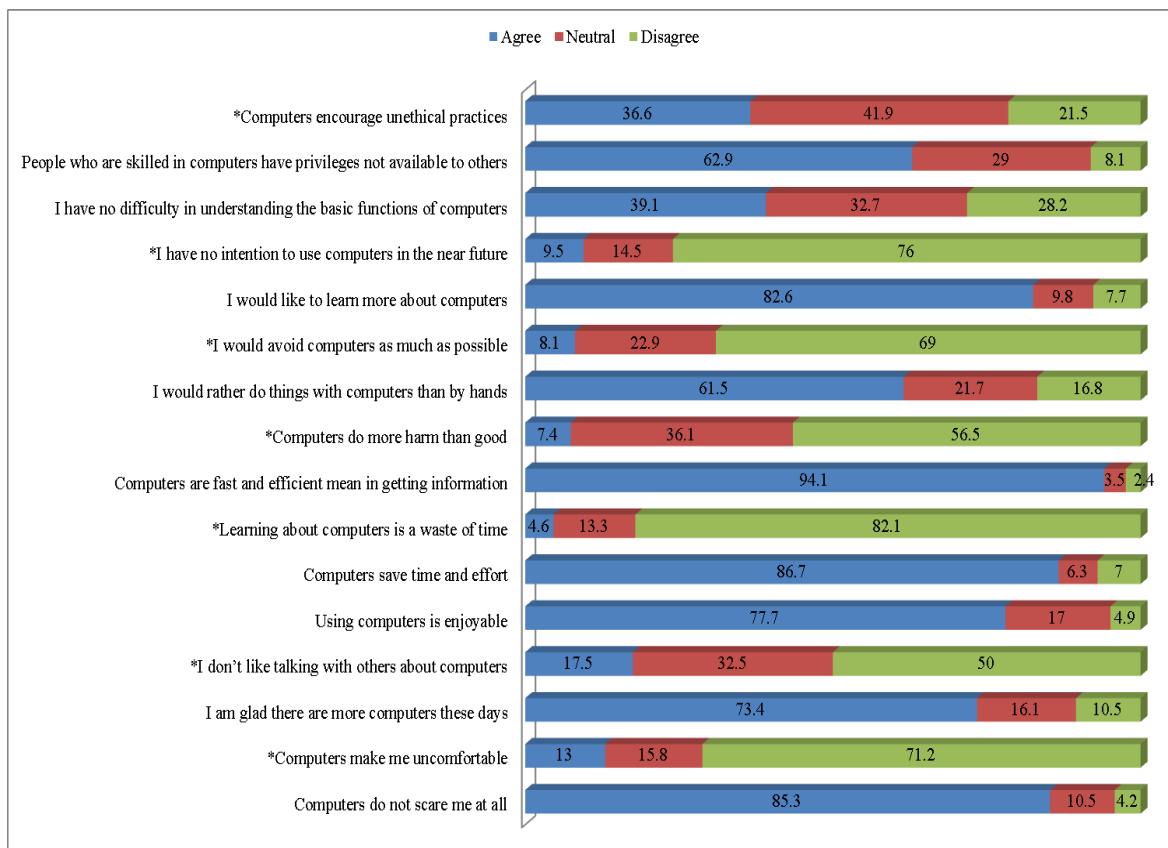
Figure 10: Frequencies of Teachers' Attitudes toward Computer Technology in General

The table above also shows that the majority of the teachers indicated that computer technology doesn't scare them, it makes them feel comfortable, and that using computers is enjoyable for them.

Throughout the interviews, I asked teachers several questions to discern some of their perceptions about computer technology. Most teachers revealed that they use computer technology because it saves time and effort. This is evident when teachers used it for administrative purposes like keeping folders of previous exams and lesson plans. Every year, instead of writing new lesson plans right from the beginning, teachers just made small changes to the old files. I think teachers felt and observed the efficiency of computer technology and took advantage of it.

The teachers' perceptions of the efficiency of computer technology appear again in their responses in the above table, which shows that 86.7% of the teachers agreed that computer technology saves time. However, only 61.5% of the teachers indicated that they would rather do things by computer than by hand, and 16.8% of them they still prefer to do it by hand. Ms. Maggie indicated in the interview that to write an exam using the computer takes around three hours, whereas writing it by hand takes her only half an hour. And because of that she does everything by hand. When Ms. Maggie is required to do work on the computer, such as for mid-terms and final exams, she asks her sister or somebody else to do it for her.

Teachers who use computer technology in teaching emphasized the point that computer technology attracts students' attention. The colors, motions, and animations in PowerPoint presentations catch the students' attention and make them sit quietly and listen to what teachers are teaching or lecturing. According to some teachers and supervisors, multiple representations of an idea using different colors and motions forces students to use different senses in learning and that enhance and deepen their comprehension of the information.

Using more than one teaching aid in the classroom attracts students' attention and makes them not to forget information. All education scholars said that remembering things from experiencing it through seeing, hearing, and touching, is not similar to experiencing it through hearing only.	استخدام اكثر من وسيلة تعليمية في الغرفة الصفية بنخلي الطالب يجلب انتباهه بنخلي مينساش المعلومات، في قاعدة في التربية، كل علماء التربية بقولولك انتِ بتسمعي شيء ما بتتذكريه مثل ما بتسمعيه وبتشوفيه وتلمسيه، فكل ما استخدمتي وسيلة فيها اكثر من حاسة كل ما كان الطالب اله ادراك الها وما بينساها اكثر، انت لما بتحكي عن الحاسوب هو شاف الوسيلة استخدمها، شاف الصورة تمعن فيها، اذ كانت متحركة بالنسبة له نقلته لجو الموضوع اللي انت بتتحدثي عنه، لا يمكن ان ينسى موضوع الدرس او المعلومة هاي، هن هذول الامرين اللي خلانا مثلا انا نركز عالحاسوب

Some teachers indicated that they sometimes use computer technology because it makes students more disciplined and quiet in the classroom. That is due to the fact that students really like using computers because technology is the language of their generation. Actually many teachers raised that point in one way or another. Ms. Ola laid out this point very nicely by saying:

The young generation is fond of the Internet; every girl has a computer device at home. If computer technology is being used, and teachers	جيل الشباب اليوم مولع بالانترنت ,كل بيت عنده جهاز أو اكثر ولمن يجوا على المدرسه منها هذا الاشي بشبع رغبتهم

encourage that, students will find that their interests for that direction is fulfilled and that will increase their Interest to learning. Students love when I tell them that we will go to computer lab or language lab and they sit quite during that period, while in regular class without using computer technology, I need like 10 minutes to make them sit quietly. Audio and visual effects in addition to the teacher are the best academic atmosphere to students.	ومعلمة بتشجعهم بصير عندهم رغبه في التعلم افضل ,كثير بحبوا لما بحكيلهم هذه الماده محوسبه ,تعالوا نروح على مختبر اللغة بكيفوا البنات وبقعدوا ساكتين وهادين في حال الحصة العادية بدك تقريبا 10 دقائق وانت تسكت في البنات , لانها المؤثرات السمعيه البصريه بالاضافة للمعلم بتعطي جو دراسي افضل للطالبات.

The second set of statements in the questionnaire aims to explore teachers' attitudes toward integrating computer technology in education. It found that 73.6% of the teachers indicated that computer technology will improve education, and 74.1% agreed that schools would be a better place with computers. 75.8% of the teachers indicated that computer can enhance students' learning, supporting the argument that computer technology attracts students' attention. 76.1% of them also agreed with the statement "using computer technology in teaching would make the subject matter more interesting." Table 23 presents more of their answers below:

Table 23: Frequencies of Teachers' Attitudes toward Computer Integration into Education

Attitudes toward integrating computer technology into education	Agree	Neutral	Disagree
Computers will improve education	73.6	21.5	4.9
Computers should be the priority in education	60.8	30.9	8.3
*Schools would be better place without computers	4.5	21.3	74.1
*I do not think I would need a computer in my classroom	16.2	29.6	54.2
Computer can enhance students' learning	75.8	19.3	4.9
Computers would motivate students to do more study	57.5	29.5	13
Teaching with computers offers real advantage over traditional methods of instruction	60.8	29.7	9.5
Computer technology can't improve the quality of students' learning	51.4	31.8	16.8
Using computer technology in teaching would make the subject matter more interesting	76.1	18.2	5.6
Computer use fits well with the curriculum goals	35.1	51.6	13.3
Computer use suits my students' learning preference	52.6	36.8	10.5
*It would be hard for me to learn to use the computer in teaching	14.3	29	56.6
*Computer complicate my task in the classroom	15.1	34.2	50.7
Computers have proved to be effective learning tools worldwide	72.6	21.4	6
*Computer will not make a difference in our classrooms,	12	29.2	58.8

schools, or lives			
Students need to know how to use computers for their future jobs	90.2	7.4	2.5
There are other social issues that need to be addressed before implementing computers in education	68.5	26.6	4.9
Computers have the potential for creating environment to help students solve problems	64.5	25.8	9.8
Computers help students collaborate with others	64.7	25.2	10.1
Computers help students create products like creating websites, newsletter	85.4	11.1	3.5
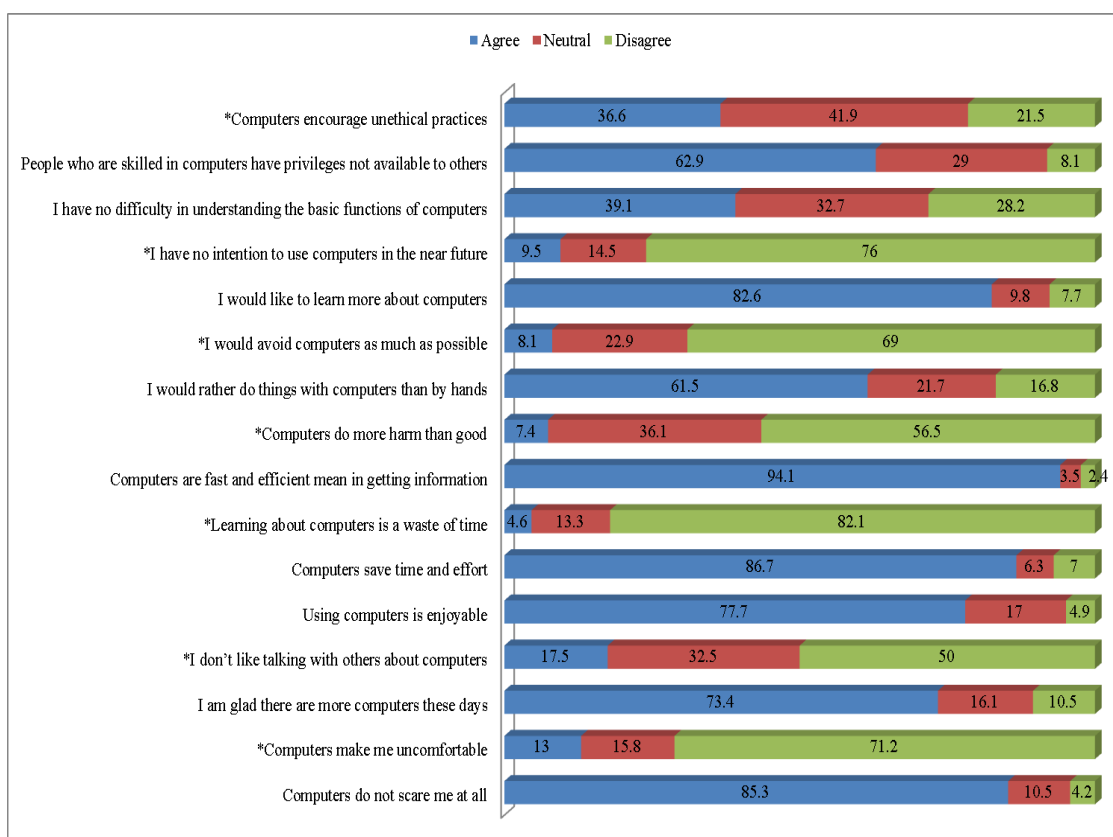
Figure 11: Frequencies of Teachers' Attitudes toward Computer Integration into Education

"Fundamental" Change in classroom's environment is another point that was raised by many of the teachers. Computers for student use in all schools are only located in computer labs, or the schools' library or science lab. This means that students have to leave their classroom, where they spend 6-7 periods a day, and go to a new environment to use computer. This change

makes them more attracted, interested and engaged in that period. Moreover the teacher during that period will change his/her style of teaching and integrate a new tool that they like.

In short, I can say that overall teachers have a good perception of computer technology and its integration into education in general. 73.4 % of teachers stated they were glad that there is more computer technology in the classroom these days, and 82.1% of them think that learning about computers is not a waste of time. One of the points the "non-user" teachers made which I found very interesting is that they encourage their own children to use computer technology in learning and they provide them access to computer and Internet connectivity. I think this act is due to the fact that they think computer technology is very important for their children's futures and that is also detected in the questionnaire, which shows that 90.2% of teachers think students will need to know how to use the computer for their future jobs.

Interviews with the teachers gave a good picture of their attitudes and perceptions about computer technology and integrating it into education in general but meeting with the supervisors helped to deepen that understanding because supervisors work and meet with teachers from different schools in different settings. My meetings with the supervisors provided broader and deeper understanding of teachers' attitudes and beliefs toward computer technology. There is some disparity among teachers' attitudes toward computer technology as described in the interviews with the supervisors, teachers who are with the change and development and teachers who are against. Teachers who are amenable to change, and who have good motivation about computer technology are mostly teachers who are young with little teaching experience. Supervisors were quoted as saying "younger teachers tend to be more users" and "more experienced teachers tend to be fewer users"."الأكثر خبره أقل أستخداما"و "أصغر سنا اكثر إستخداما".

Teachers who are against the change tend to be older teachers with many years of teaching experience. Supervisors indicated that change takes time and those teachers who are considered to be "old" may retire in few years before they even gain the technology skills. In

130

addition to that those "old" teachers will take longer time to learn using computer technology. My question to one of the teachers who said she would retire in 2-3 years was what she would do if the MoEHE required her to integrate computer in her teaching. Her reply was that either she would ask for retirement, or, according to her, by the time the policy would be implemented, she would be retired already.

A one- way ANOVA was used to test the effect of teachers' age on their attitudes to computer integration into education. There was not enough evidence to prove this relationship Size, $F_{(7,259)} = 1.589$, $P = .139$

Table 24: Descriptive ANOVA Results on Teachers 'Age

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
20-24	15	7.4667	1.59762	.41250	6.5819	8.3514	5.00	10.00
25-29	56	8.0357	1.65105	.22063	7.5936	8.4779	3.00	10.00
30-34	51	7.9608	1.56155	.21866	7.5216	8.4000	4.00	10.00
35-39	44	7.2727	2.29624	.34617	6.5746	7.9708	2.00	10.00
40-44	37	7.5405	1.99436	.32787	6.8756	8.2055	1.00	10.00
45-49	29	6.8966	2.17691	.40424	6.0685	7.7246	1.00	10.00
50-54	19	7.2632	2.64243	.60622	5.9895	8.5368	.00	10.00
55-59	6	6.8333	1.32916	.54263	5.4385	8.2282	5.00	8.00
Total	257	7.5720	1.96345	.12248	7.3308	7.8132	.00	10.00

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	42.211	7	6.030	1.589	.139
Within Groups	944.707	249	3.794		
Total	986.918	256			

Teachers with master's degrees were found to be more likely to have a positive attitude about integrating technology into the classroom. One supervisor stated:"Most of them are holding master degree; having a Master's give them a big push "بكونوا أغلبهم ماجستير, وبالتالي الماجستير بعطيهم دفعه".

Teachers with master's degrees were more likely to have positive attitudes toward the use of computer technology in the classroom because they had more experience using it. Teachers during their graduate studies use computer technology to communicate with their faculties, write their papers, search for information and that help them to become frequent computer technology users. Some supervisors actually indicated that those teachers would find other solutions and ways to overcome some of the challenges.

A one- way ANOVA was used to test the effect of teachers' education level on their attitudes to computer integration into education. There was not enough evidence to prove this relationship. Size, $F_{(2,279)} = .968$, $P = .381$

Table 25: Descriptive ANOVA results on teachers' Education Level and Attitudes

Descriptive

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
diploma	30	7.5667	2.12835	.38858	6.7719	8.3614	3.00	10.00
B.A	227	7.4670	1.97159	.13086	7.2091	7.7248	.00	10.00
Master's and above	25	8.0400	1.61967	.32393	7.3714	8.7086	4.00	10.00
Total	282	7.5284	1.96071	.11676	7.2985	7.7582	.00	10.00

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.444	2	3.722	.968	.381
Within Groups	1072.829	279	3.845		
Total	1080.273	281			

An independent sample t-test was conducted to compare the attitudes of computer integration into education for male and female. As shown in the table above, p was less than 0.05, therefore I can say here that there was significant difference in the scores for males (M=7.7878, SD=2.47604) and females (M= 6.6503, SD= 2.82361).

Group Statistics

Gender	N	Mean	Std. Deviation	Std. Error Mean
Male	123	7.7878	2.47604	.22326
Female	161	6.6503	2.82361	.22253

Table 26: Independent Sample Test Results on Difference of Attitudes between Males and Females

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means							
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	4.301	.039	3.546	282	.000	1.13749	.32080	.50603	1.76896
Equal variances not assumed			3.609	276.634	.000	1.13749	.31522	.51696	1.75803

Both teachers and supervisors brought up the concept of technology as the "language of the new generation." Very often, teachers frequently stated that technology is for the younger generation and that is the motive for their encouragement and support to their children's use of computer technology in their learning yet they do not integrate it themselves into their teaching.

Supervisors showed sympathy toward teachers who they considered "old" and indicated that it was not the teachers' fault that they could not use computer technology because it did not originate in their generation. Therefore supervisors did not ask those "old" teachers to use computer technology. On another point, some supervisors indicated that they noticed that training workshops were mostly conducted for "young teachers" which some of them were against.

Ms. Maggie's experience in using computer technology in writing her exam paper is another measure that should be taken into consideration according to Hargittai (2003). Teachers who do not use computer technology very often take longer time in typing exam paers or worksheets and that is due to typing diffeculties or document formating issues. Teachers' experiences in using computer technology affected their responses to the length of time they needed in designing PowerPoint presentations or typing exam paers.. Some teachers indicated that designing a PowerPoint presentation might take them three hours and some teachers said three days. I think we need to look fairly at teachers' experiences in using computer technology when we want to review computer technology use.

A one- way ANOVA was used to test the effect of teachers' experiences on their attitudes to computer integration into education. There was enough evidence to prove this relationship. Size, $F_{(2,289)} = 3.275$, $P = .039$. Since p is less than 0.05, I can say that teachers with less experience have positive attitudes toward computer technology more than teachers with more experience.

Table 27: Descriptive ANOVA Results on Teachers' level of Experience and Attitudes

Descriptive

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1-5 Little experience	81	7.8642	1.57919	.17547	7.5150	8.2134	4.00	10.00
6-9 Some experience	43	7.8837	1.66489	.25389	7.3713	8.3961	4.00	10.00
10+ Experienced	165	7.2727	2.19579	.17094	6.9352	7.6103	.00	10.00
Total	289	7.5294	1.98256	.11662	7.2999	7.7589	.00	10.00

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	25.348	2	12.674	3.275	.039
Within Groups	1106.652	286	3.869		
Total	1132.000	288			

5.3.4 Policy and Leadership

Several issues of policy and leadership emerged in the interviews with teachers and supervisors. This refers to having a policy for computer integration, and the support that teachers get from the Ministry, supervisors and colleagues.

An "indirect call" from the Ministry to use computer technology in education is very often said by supervisors and teachers. Supervisors and teachers assumed that the workshops and the training that is taking place in all education directorates are indications of a way for a push toward computer integration. Supervisors indicated that organizing competitions between teachers and students to design technological material, and encouraging supervisors and teachers to communicate with them through emails are other indirect ways to encourage supervisors to use computer technology.

Based on the interviews, I can say that there is a mixed message from the Ministry about the use of computer technology in the classroom. Teachers confirmed that the Ministry and Education Directorates require them to use computers for administrative work, but nothing stated to use it in teaching. They said that some principals encourage them to use computer technology in teaching but it is not required. Teachers assumed that the ongoing training and workshops that are being held is a sign for them that there might be a policy regarding the use of technology in schools.

135

During the interviews, supervisors gave different answers on the policy aspect; several supervisors implied that the Ministry indirectly is pushing them toward computer use, and that they are being asked to communicate with the Ministry and with other supervisors and teachers through email. The technology project competitions that are organized by the Ministry and the ongoing trainings that are being held are also other indications that there is an indirect push to use computer technology. One supervisor said that there is no policy in regards to the use computer technology but he confirmed that the actions are indirectly asking them to use computer technology. Another supervisor stated that there is a policy that encourages teachers to use different tools in teaching and technology is one of them, and the supervisors were asked to pass on this message out to teachers in schools.

The lack of coherence and understanding between supervisors and teachers in regards to the policy issue reveals the inconsistencies and disagreements among the Ministry parties on education reform and good teaching practices is another observation in this study, the MoEHE as was explained in figure 6 consists of several units and key personnel; for example there is a center for curriculum which is responsible for all the issues related to textbooks. The National Institute for education and training unit coordinates the training that is provided by universities, while the Department of Supervision and Qualification ensures the quality of teaching in the classroom by employing 500 supervisors in practice (Shinn, 2012). Additionally, the Department of Assessments and Evaluation is in charge of all national, international assessments. Due to this lack of understanding, teachers find a disparity between what the teachers are asked to practice, the textbooks that teachers use, assessments and evaluation that they find at

the national assessment is another observation in this study. That disparity was a confirmed in one of the policy makers' interview and he/she hoped for more coordination among all the units. That disparity was discussed by Shinn (2012). He argues that supervisors, principals, district directors, and other administrators need to agree upon the instructional practices they expect teachers to acquire so they can support continuous improvement.

A lack of coordination among public private partnership, especially in terms of internet connectivity and sharing and disseminating the PEI's goals and objectives among teachers, is a result of this lack of coherence and understanding. The mixed result that I got from teachers and supervisor is another indication of this incoherence.

The whole issue of ambiguity in the Ministry's' message about technology in education is affecting the supervision and technology integration process. The next paragraphs will highlight some of these effects.

As was discussed earlier, some supervisors appreciate seeing teachers use computer technology in teaching but at the same time they consider it as an extra or part of teachers' innovations. I think that some teachers who are hesitant about using computer technology in teaching will use it as a justification for not using computer. Supervisors confirmed the teachers' point, arguing that teachers lack the access, the skills and the competency to use computer technology in teaching. They elaborated by saying that computer labs are used most of the time for technology subject classes and some teachers do not have the computer technology at homes, so it would be very unfair to request teachers to use computer technology in teaching.

The issue of following up with teachers was brought up during policy makers' interviews. Some of the policy makers confirmed that supervisors work with teachers and follow up with them after the training. Mr. G laid out this issue differently; I think his response reflects what is really happening on the ground.

First there is a follow-up, which means that there are instructions for following up and there are supervisors for that purpose, but it is not existed in the field, or not balanced let me say. You go to one area and you find that computer technology lab is not used there.	الاصل انه في متابعة، يعني نظريا على ارض الواقع عنا تعليمات في للمتابعة، كمان ميدانيا على ارض الواقع في جسم للمتابعة، في عنا مشرفين للمتابعة، بس هذه المتابعة مش يعني او هذه مش كيف يعني مش موجودة، مش متوازنة بمعنى مش متساوية بكل منطقة، بتروحي على منطقة بقول لك المختبر ما حدا استخدمه

The crucial question is why is the unbalanced in following up? According to him

The absence of following up is due to frequent projects that the ministry initiates; I am against lots of projects done by the ministry. The ministry is burdened with projects; there are more than 69 projects. Supervisors declared that if the policy makers want them to follow up with teachers, they should not hand supervisors four projects. Each one will be at the expense of the other, and then supervisors will be in favor to the project that they like or specialized in	نقطة الضعف اللي جاي بالمتابعة مرات الها علاقة بكثرة المشاريع، انا ضد كثرة المشاريع بالوزارة، هذه الوزارة مرهقة جدا بالمشاريع، فيها اكثر من 69 مشروع، والمشرف بقولك انا بدك اتابعلك المعلمين واتابع اداؤهم ما تسلمني اربع مشاريع، كله على حساب بعضه، او بالاخر بتحيز للاشي اللي بحبه اكثر او بفهم فيه اكثر او للاشي اللي عند المسؤول الان، فإحنا

During my data collection that there were more than 60 on going education projects that were running in MoEHE. Shinn highlighted that point in 2012. This number is very large, especially considering that many of those projects focus on improving the quality of teaching, which leads to engaging teachers, principals and supervisors in those projects. Being involved in many projects as was indicted by one of the policy maker may lead to distraction and may converge to paths far beyond ministries' goals and vision. Teachers may feel cynical, frustrated, and burned out, especially if they do not see positive outcomes from those projects like improving students' performances.

The project saturation is affecting the following up process too; this point was brought up often during the interviews. Teacher and superiors complained about the lack of following up after each training. Policy maker's interviews indicated that supervisors are responsible for following up. As what the policy maker highlighted in the previous quotation, I think being involved in many projects makes it hard for supervisors to follow up after each training and project.

According to Khalili (2010), it is the supervisor's responsibility to help teachers deal with the curriculum, aid them in developing instructional materials, and ensure that they utilize the training ideas in their teaching. However, there are no clear strategies for follow-up with teachers after participating in any teacher professional development or training. Teacher trainers are not necessarily the teachers' supervisors, so follow-up frequently does not occur. This means that the supervisors are not aware of all the professional programs in which their teachers have been involved. Therefore, supervisors visit teachers and support their professional growth but without relating this support to their professional development programs. Khalili's (2010) point supports teachers and supervisors' complaints and justifies the variations of the supervisors' support. Supervisors are aware of the training or participate in follow up with teachers and ask them how they are applying it in teaching. Mr. G's last point gave a good explanation of the disparity in supervisors' support.

To summarize the kind of support that supervisors provide for computer integration in the classroom, I can say that supervisors provide teachers with some of the CDs to use in teaching, recommend some of the websites for teachers to use if they want, and following up with teachers in using computer technology as an administrative tool.

5.3.5 Teachers' Competency Level

The second track of the Palestinian Education Initiative's goal to move from a teacher-centered approach to teaching to a student-centered approach is to improve the competency of teachers in the use of technology, supervisors and principals. Policy makers' interviews dispelled that idea. The Ministry provided the training to teachers to equip them with the needed skills to help them using computer technology in their teaching. Several training workshops were highlighted during the interviews. One that came up frequently was a workshop called "Intel." The goal of this workshop is to train 12,000 teachers within three years to help them become "literate" in using computer technology.

There is a manual that is explicitly for Intel teach, it includes all the needed skills that teachers should get to apply ICT in teaching. It starts from the ability in using the machines to ability to employ some of computer applications like Power Point in teaching.	في عنا Manual خاص هو Intel teach، اللي بحكي اللي هو بتضمن كل المهارات اللي لازم المعلم يكتسبها حتى يكون قادر على ان يوظف تكنولوجيا المعلومات والاتصالات في التعليم، وبالتالي هي مهارات مختلفة تبدأ لقدرته machine من قدرته على استخدام الحاسوب ك على توظيف بعض البرمجيات مثل البور بوينت واشياء اخرى، لقدرته على توظيفها في التعليم من خلال استعراض مفاهيم معينة أو بطريقة اخرى.

Training must provide teachers with knowledge of the very basics of computer technology use. Teachers need to know how to operate a computer; they also need to know how to use accompanying devices like mouse, disc drives, printers, speakers. It is also important to know how to perform basic system operations like program installation and deletion, and back up files. Teachers should know some basic commands like Save and Delete (Bitner & Bitner, 2002). My questions to the policy makers were mostly about what the trainings would include. Mr. W. responded:

Teachers in the questionnaire were asked to indicate their competency levels regarding some statements, below are their responses:

Table 28: Teachers' Competency Level

Competency level	High Competent	Moderate Competent	Little Competent
Install new software on computer	54.0	19.3	26.7
Use printer	75.6	11.2	13.2
Use computer keyboard	87.4	7.0	5.6
Operate word processing program (e.g. Word)	77.1	10.7	12.2
Operate Presentation Program e.g. Power Point)	60.5	16.1	23.4
Operate a Spreadsheet program (e.g. Excel)	54.9	18.4	26.7
Operate a graphics program (e.g. Photoshop)	41.0	62.2	37.8
Use the Internet for email	68.7	12.3	19.0
Communicate with others like chatting	50.3	21.4	28.3
Use the World wide Web to access different types if information	77.3	11.2	11.5
Using computer to evaluate students' learning outcomes and grade keeping	56.0	20.4	23.6
Create and organize computer files and folders	60.8	16.8	22.4
Using computer to collaborate with other teachers	51.0	25.2	23.8
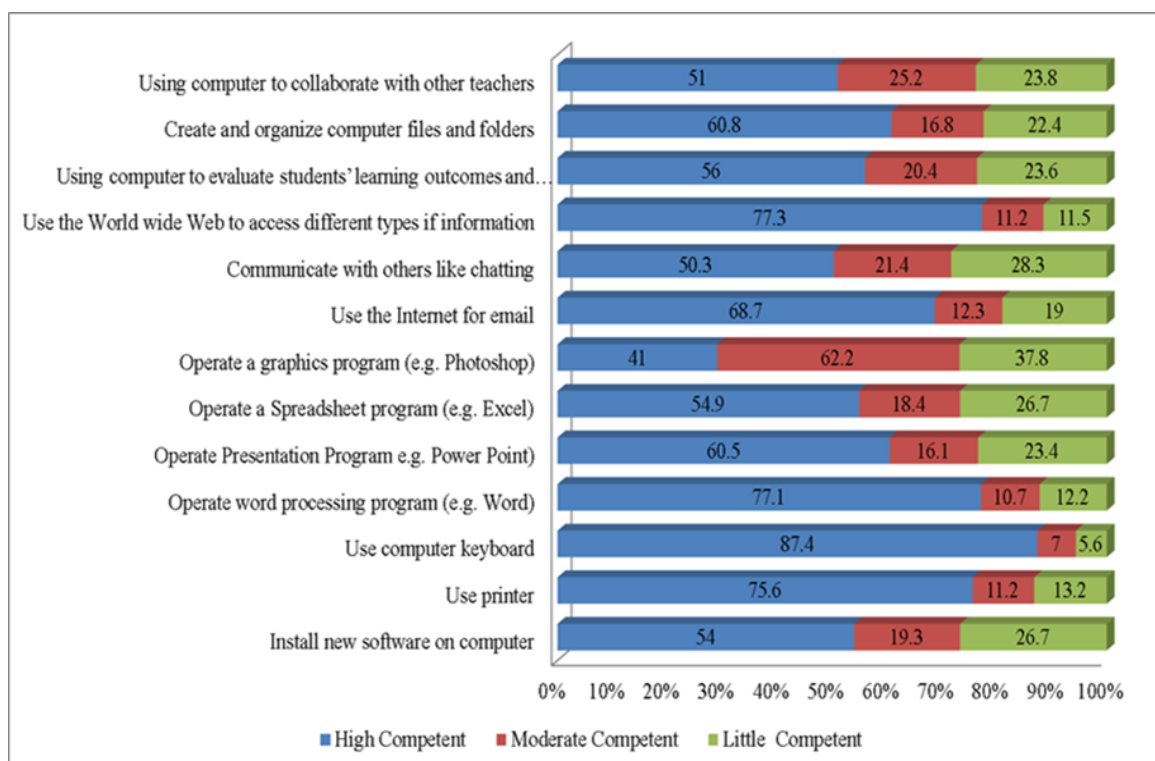
Figure 12: Teachers' Computer Technology Competency Level

The chart shows that some teachers are competent in some of the basic skills in using computer technology. I think the Ministry needs to works harder to train the other teachers in getting the basic skills to use computer technology. Hopefully the Intel project will be able to train the other teachers as its goals are to aid 12,000 teachers in developing their basic skills in computer technology.

On another section of the questionnaire, teachers were asked to indicate some of sources that helped them gaining some computer technology skills. Their responses are shown in the graph below:
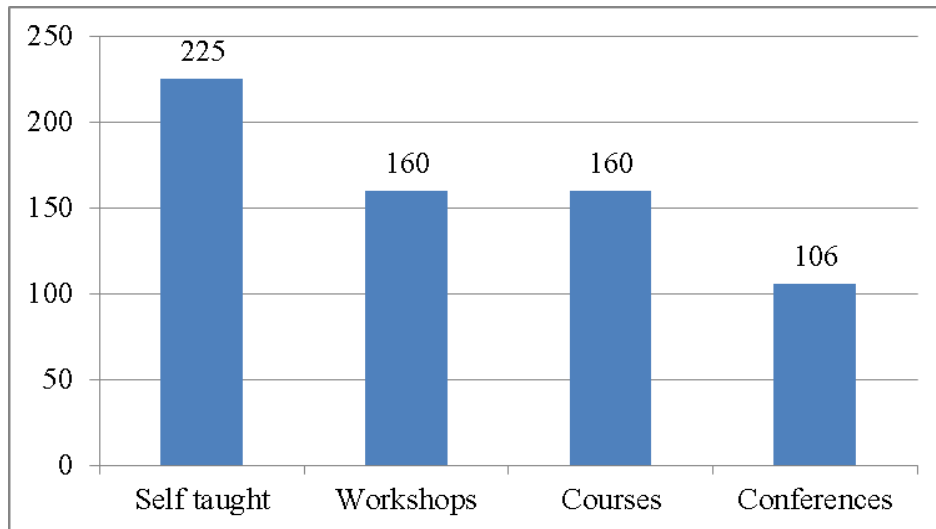
Figure 13: Sources of gaining Computer Technology Skills

The graph shows that most teachers acquired the skills for using computer technology through self-learning more than workshops or any other sources. This relates to what one of the supervisors said when they were asked about teachers' motivation in using computer technology. He stated: الدافعية عند المعلمين بالدرجة الاولى هي ما بتكون للتعليم، وانما هي "Teachers' motivation for computer is not مايبيوتر بتكون تثقيفية، هلا هو من داف ذاتي بصير يتعلم على الكمبيوتر" mainly to use it in teaching, but it is for their own education. And that motive is behind the self-taught learning."

Despite what was said, about teachers' self-learning, some training pitfalls were mentioned among teachers and echoed also by one of the policy makers. PEI is a platform for all projects that relate to computer technology. All the training that relates to computer technology is organized through projects. Having said that, all the training workshops are a one-shot deal, and the time is limited, so teachers and supervisors do not take their time in learning and practicing.

Teachers also revealed that prerequisite skills are necessary to get the most out of some of the trainings, which many of the teachers/participants lack. This leaves teachers

out of the training environment as they will talk about things they are not aware of. If the

trainer decides to base the trainings on teachers' skills, some of the planned goals and

objectives of the training will not be achieved. Actually some of the teachers suggested

passing a recommendation to the PEI that requests trainings that suite participants' skill

levels, specialties. Supervisors and Mr. G from the policy makers echoed that saying:

Coordination here at the Ministry is not 100% organized. Sometimes teachers with five training computer workshops experience, come to a training for (not finished sentence)	يعني احنا coordination عنا مش كتير يعني مضبوط ميه بالميه، لانه مرات بيجي شخص عنا ال معاه 5 دورات حاسوب وجاي على دورة --------- -- بقول انا مش محتاجها، هلا احنا في عنا حالة، بنحاول حاولنا ندّخل ي

As was stated earlier, some teachers are more competent in terms of having

mechanical and basic knowledge skills in using computer technology. In addition to that

basic knowledge, teachers also need to learn how to use computer technology as a tool in

the classroom (Becker, 2000; Sandholtz, 2001). Teachers revealed that the workshops do

not train them in how to incorporate computer technology into teaching and most of the

trainings are about using Microsoft Word Office. Most of the teachers mentioned an ICT

training workshop that was organized by the British Council and focused on using the

Internet and email. Some teachers benefited from it a lot, while other it was above their

skill level and did not learn much.

A lack of training and or irrelevant training was frequently mentioned in the

literature as a barrier against teachers integrating computer technology into the classroom

(Becker, 2000; Pelgrum, 2001; Cuban, 2001). In many cases according to Sandholtz,

(2001), the focus has been on acquiring hardware and software rather than preparing

teachers to use technology. That leaves the teacher unprepared to use computer

technology in their teaching and decreases the chances for computer integration in the

classroom. Even at times when training is offered, it is usually offered in the form of a "one-shot workshops" (Woodbridge, 2004), and it is seldom offered at convenient times (British Educational Communications and Technology Agency (Becta), 2004).

So the issue of training teachers in the use of technology can by summarized in two points. The first is that the training that teachers get mostly focus on gaining basic technology skills like operating word processing, using the Internet, but does not teach them how to use technology pedagogically. On the survey, teachers most frequently suggested that they wanted trainings on how to use computer technology as a teaching tool. The second point is that the training programs do not match with teachers' skills and needs. There were times that the training was below the teachers' skills and sometimes above their skills, and in both cases the teachers did not benefit much.

Technical faults with ICT equipment are likely to lead to lower levels of ICT use by teachers. In British Educational Communications and Technology Agency (Becta), (2004) literature review report, they found a relationship between lack of technical support and teachers' use of computer technology. The expectation of faults occurring during teaching sessions is likely to reduce teacher confidence and cause teachers to avoid using the technology in the future. Therefore, to ensure integrating computers fully, teachers need adequate technical support to assist them in using different technologies (Cuban et al, 2001; Toprakci, 2006; Mumtaz, 2000). Having read that, it made me wonder about the kind of technical support the Palestinian MoEHE is providing to help ease teachers' fear of technology. All supervisors stated that the Ministry provides one technician to each educational directorate to repair any computer or printer defect in schools.

In each education directorate, there is a department called Department of techniques. For example in Ramallah there is 5-6 staff working in that department and their specialty is computer. One of those staff is responsible of taking care of computers, in schools. That person daily visit schools in all education directorate and repair what need to be repaired	في كل مديرية قسم اسمه قسم التقنيات في المديرية، يعني في مديرية رام الله فيه 5 الى 6 موظفين اذا مش اكثر، وتخصصهم طبعا بتعلق بالحاسوب وبالتالي هناك احد الموظفين مسؤولية مباشرة عن الحواسيب في المدارس، وهو يوميا يقوم بزيارات مدرسية بناءا على طلب المدرسة، اذا كانت هناك مثلا اصيبت الحواسيب بفيروس من الذي يقوم باصلاحها؟ غالبا ما يقوم باصلاحها موظف المديرية

Teachers and supervisors underscored the point that the Ministry should provide more support to help integrate computer technology into education, such as by providing more computers for schools. Computer labs have an average of 15 computers per lab and the average class size is 35 students. Teachers also stressed the importance of Internet connectivity, and recommended that the ministry should work harder to secure Internet access in schools, especially if promoting student-centered teaching and learning. Computers without the Internet are no better than typewriters and their use is limited to the use of specific applications like PowerPoint. Based on supervisors' school visits, all supervisors emphasized the importance of providing more technical support to schools. There were many cases in which supervisors saw computers are set aside for months waiting for repair.

School environment and administrative support are also crucial to the success of computer technology integration. The literature shared some strong examples of how having the support of school administrators helped teachers integrate computer technology in the classroom (Su, 2009; Alwani & Soomro, 2010; Cuban, 2001; Office of Technology Assessment, U.S. C., 1995). School support may include providing a flexible timetabling structure schedule and changing it to fit with training sessions. I witnessed that support myself while collecting the data and interviewing teachers.

146

During school visits, I noticed that there was one school in which many of the teachers integrated computer technology effectively into their teaching. In addition to PowerPoint presentations the teachers at this school use educational blogs and forums, and encouraged students to search for information and present it to students. With the help of technology subject teachers, students were also able to design a dictionary and participate in technology competitions. That school was also among the four schools that had access to the Internet. Teachers indicated that all their success in computer integration was due to the effort and support of their principals. It was stated earlier in this chapter that PEI was built to encourage public-private partnership among the stakeholders, so it seems that principal understood that point and realized that acquiring good resources for her school will be accomplished by building a good relation with the community and local organizations that could donate money to support the school. That relationship was one of her major resources.

Teachers added also that the principal believed in her teachers and trusted their efforts to promote the teaching and learning process through computer integration. As a way to provide the necessary technical and the training support to her teachers, the principal decreased the teaching load for computer subject teachers so they could have free time to support and help other teachers as much as possible.

In summary and based on teachers' interviews, I can say that principals play a role in supporting teachers' use of technology. They do this by providing CDs, cooperating with teachers in building the schedule, looking for support from the community, and finally pushing the teachers to integrate and use computer technology.

Colleagues' support and technology subject teachers play an important role in providing support to teachers to use computer technology; many teachers indicated that they got some training from the technology subject teacher in their school. As a way to guarantee training to many teachers, the ministry used the clustering technique in which they provided training to technology subject teachers and thereafter those technology subject teachers conducted some training with their colleagues in their schools. Some teachers implied during the interviews that they learned well from those technology subject teachers. The example that was presented earlier showed that technology subject teachers could help a lot if they were given the opportunity.

In the questionnaire, teachers were asked to identify who provided them the most support using computer technology. Their responses are shown below:

Table 29: Who Provides the Support to Teachers

Computer Subject teacher	53.5
Principal	18.9
Supervisors	2.6
Colleagues	25.0
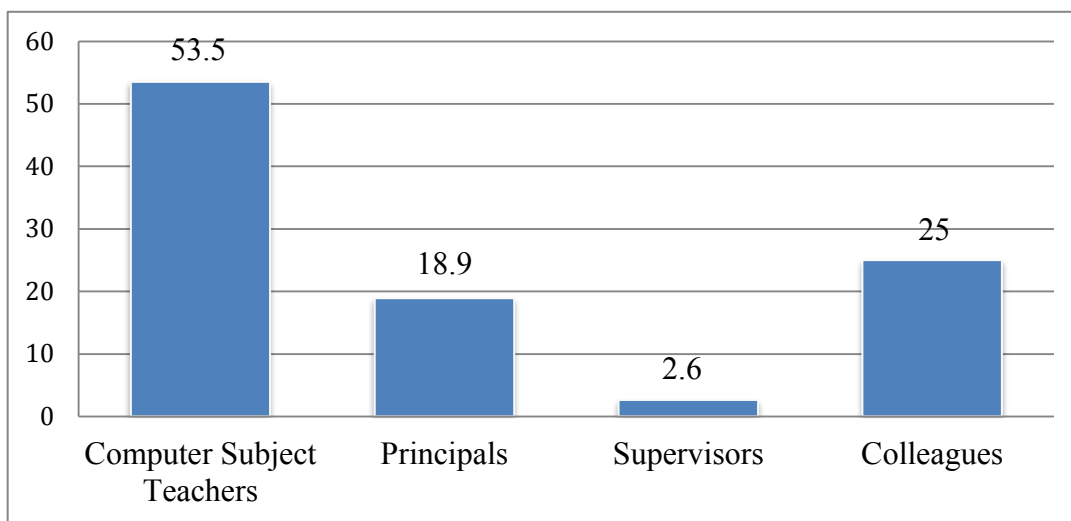
Figure 14: who provides the Support to Teachers

5.4 Factors that Hinder the Integration of Computer Technology into Palestinian Schools

Integrating computer technology as was presented in the literature review chapter depends on several key factors. These factors include external factors like school factors, resource factors and internal factors like teachers' motivation and beliefs toward computer technology integration. But for the Palestinian context, the ongoing Israeli occupation presents a key external factor which lies outside the control of the Palestinian educational system and thus cannot be addresses easily (Riyada, 2011)

The Palestinian context chapter has shown

Results from this research have shown that most teachers have positive attitudes toward computer technology, even though most teachers do not integrate it into their teaching. The data that I got from the teachers, both those who used technology and those who didn't, and their supervisors will explain that disparity to some extent. The discussion also will be supported by some of the literature. The results of the challenges will be grouped and categorized as they were categorized in the literature section.

5.4.1 School Factors

5.4.1.1 Teaching Load

Large teaching loads make it more difficult for Palestinian teachers to integrate computers into their classroom teaching. Teachers have 23-26 teaching periods weekly; this leaves them with one class period free a day. Teachers wondered when they would have the time to sit on the computer taking into account their teaching load. Teachers also noted that they use that one free period for correcting papers and homework, working on school issues, or they make use of it to rest and get ready for other class periods. Wahbeh (2006), also found that a lack of time, condensed teaching schedules of up to 26 classes

per week, and overcrowded curricula prevented teachers from using computer technology.

5.4.1.2 Lack of time

Integrating computers into classroom teaching needs time for planning and implementation. Teachers do not have the time either at schools or homes to plan how to implement computer technology. As mentioned earlier, teachers do not have the time to set up, plan, and design materials at school, and at home they have other responsibilities like home chores, teaching their own children, and also correcting papers. One teacher said that planning to create a Power Point presentation for one lesson takes her 4-5 days, so she can't do that very often, and there should be other alternatives. Lack of time was also found to be one of the top barriers to technology integration in Alwani & Soomr's (2010) study and in other studies like those by the British Educational Communications and Technology Agency (Becta) (2004) and Williams, Coles, Wilson, Richardson, Amanda, & Tuson, (2000).

Teachers also needed time to use technology in the classroom. According to some teachers, especially who are at an early stage of using computer, teachers need two periods to finish teaching one lesson using computer technology. That lesson without computer technology normally could be done in one class period. This disparity of time is due to a lack of experience integrating technology into lesson plans, and also a lack of computers and hardware that forced the teachers to divide the class into groups for rotations. When talking to other teachers who used computers very often, the teachers indicated that using a computer saves time, especially when they use it to explain abstract concepts.

150

A lack of time may also be due to the fact that the curricula are very long and teachers feel they are in a race to finish them and do not have the time to think of using computer technology. Teachers revealed that they fill out a form at the end of each semester indicating how many units they covered from the textbooks and the reason for not finishing the required units. According to one teacher, there is a unit in 9th grade curriculum that requires computer application and she claimed that she did not have time to take them to the computer lab. She was behind in covering the textbook; therefore she asked students to work on it on their own.

The pressure of testing gave teachers another excuse for not using computer technology and not having the time to try new things. As the Palestinian Education system depends on summative exams for graduations and elevation of students, the teachers' main focus is on finishing the curriculum on time. This was also indicated when the teachers stated that they believed elementary teachers could integrate computers into the classroom better and more often than secondary school teachers. This view aligned with that of Qablan, Abuloum, & Abu Al-Ruz (2009). Qablan et al (2009) found that most of the Jordanian teachers in their study did not utilize computers in teaching higher level classes as these classes are required for passing board examinations at the end of school year

As result of not having computers in classrooms, teachers who do not use computer technology stated that they need to take the students to the computer lab or the library if they want to use computer technology. This process takes about fifteen minutes of class time, as it takes five minutes to go to the library, five minutes to go back to classroom, and an additional five minutes to set up the machines. Teachers who integrate

computers into teaching indicated that this was an issue at the beginning but then students got used to it. They started taking advantage of the five minute break time between classes to move the students from and to computer lab.

5.4.2 Resources

5.4.2.1 Internet Access

We saw earlier how lack of the internet connectivity in schools affected teachers attempting to integrate computer technology, and also how it affected the quality of using that technology. We saw how schools are not allowed to have the Internet connection in their budget and that they should need to seek funds from outside and local donors in order to procure that technology. We can't forget the external political challenge that regulates getting high 3G and 4G speed Internet.

5.4.2.2 Technology Resources

Technological resources were identified as challenge among Palestinian teachers in this study and in the literature too; teachers pointed out that students and teachers need computers to use these resources. Having an average of fifteen computers in a computer lab is not enough for a class of 35 students or more. Also having one computer in the teachers' room for all teachers to use is not enough and the teachers asked for more computers.

Some teachers indicated also that there is lack of online resources in Arabic, especially in scientific subjects, and they had to rely on international resources and requested some translations for some teachers. That point was highlighted by some teachers while other teachers pointed the availability of online resources in Arabic.

There are two possible explanations for this disparity. It could be due to the fact that Arabic resources are only found for certain subjects; for example science subject

teachers claimed there was a lack of resources in Arabic, while Arabic, Social Studies, Religious Education subject teachers claimed there was a great availability of resources in Arabic. It could be due also to the frequency the computers are used and the ways in which they are being used. For example, teachers who use computer technology very often will be able to identify faults in the resources

We saw the amount of technical support the Ministry has provided to school and how supervisors explained that lack made computer machine to be left aside for weeks waiting for repair

5.4.3 Teacher

Results showed how training and workshops were able to improve some of teachers' basic computer knowledge skills, but they also indicated that those trainings were most of the time one-shot trainings and did not help to use teachers to acquire the necessary skills to integrate computer technology effectively into teaching. The results for the questionnaire showed that too.

The lack of knowledge on how to use computer technology as a teaching tool inside classroom is another challenge that teachers mentioned. Teachers need to conceptualize the various uses of programs and their application in teaching, and how the computers can facilitate the teaching and learning process (Bitner & Bitner, 2002; Sandholtz, 2001). According to the teachers, the trainings that were conducted focused on building basic skills and did not train them in how to use computer technology as tool.

It was pointed out among teachers and supervisors that age is considered a challenge among Palestinian schools. The unwillingness is due to two reasons. The first is that older teachers who are approaching retirement age are not willing to spend time learning the technology, especially if that technology is very complex to them and it takes

a long time to learn how to use it. By the time these older teachers learned the skills

necessary to use the computers; they would reach the retirement age and would not use or

apply those skills in their teaching. The second reason is that some other teachers reject

the idea of change and will only apply the teaching methods that they were taught

initially and had been using for years. The introduction of computer technology into the

classroom scares and concerns them, because they fear that if they cannot use the

technology it could jeopardize their reputations as teachers (Bitner & Bitner, 2002).

5.4.4 Social Acceptance

This challenge was brought up in a study by Wahbeh (2006). The various focus

groups that he had in his study revealed that most of parents worry about children using

computer technology, especially the Internet, and believe that children must reach a

certain age they can use the Internet. This concern was brought up again by some

teachers who mostly use the Internet. I mostly found it in the unique school that I talked

about in which many of the teachers used computer technology. The teachers in that

school stated that they had issues with the students' families in regard to using computer

technology and more specifically using the Internet.

There was another incident that supports teachers' statement about social

acceptance, in one my school visits to interview teachers and while sitting down to have a

discussion with the principal, one of the student's fathers called the principal and stated

that he did not want his son to go to the computer lab and use the Internet. The principal

at that time told to me that this kind of example discourages principals and teachers from

using computer technology.

5.4.5 Concluding Summary

The second section of the finding mostly focused on the emerging themes that came up from teachers' and supervisors' interviews. Access, computer technology is the language of new generation, policy and leadership, and teachers' competency level are the main themes that came up from interviews and reflected teachers' attitudes about computer technology. The second section also covered some of the factors that hinder the integration of computer technology; such as school factors which includes teaching load, lack of time.

Social acceptance is a unique finding within Palestinian education system. It relates to parents concerns of letting their children use the Internet.

5.5 Chapter Summary

Reporting the findings and discussion of the study was divided into two sections. The first part of the chapter gave an overview about the PEI then presented the goals, objectives, and the strategies that the Palestinian MoEHE is implementing to help incorporate computer technology into education. The second part of the discussion took us through the practice level, showed examples of computer technology usage, and explored teachers' beliefs and attitudes toward computer technology. It ended by identifying the factors that supported or hindered teachers from using computer technology.

By studying teachers' practices I can see that computers are primarily used by teachers to present information. This means computer technology is being used to support the traditional way of teaching. There were several minor cases that were found in which students used computer technology to collaborate and create a product and present it to the teacher and students but those cases were very limited.

The teachers I found who do use technology in interesting or productive ways were able to do so for several reasons. The first was if they had good access to hardware and the Internet, as well as an English language teacher and computer lab. The second had to do with their pedagogical beliefs. They believed that teachers are no longer the only source of information and students use computer technology in their homes and teachers need to adapt the new technology to cope with changes. The third was that they had the support of their principal. Many teachers from the same school used computer technology in an interesting way and this was because the principal supported their computer use and believed strongly in what the teachers were doing. This was shown

when the principal seeking help and support from the community, and also when the

principal was willing to make give technology subject teachers flexible schedules and

decrease their teaching load so that they could help other teachers in designing and

integrating computer technology into teaching.

The next chapter of this study will try to identify the gap between the hopes and

the ambitious goals that was presented in PEI with the real practices of computer

integration into schools. The second part of the chapter will provide some

recommendations to bridge that gap.

CHAPTER 6

CONCLUSIONS AND RECOMMNEDATIONS

6.1 Introduction

The purpose of the study was to analyze the gap between the Palestinian MoEHE's goals and vision for computer integration in classrooms and the current practices being employed to integrate computer technology into schools. To achieve that, the study analyzed the Palestinian Education Initiative (PEI) to explore its goals and vision, and examined how teachers are using computer technology in the classroom. Using a mixed method design, the study explored the following research questions:

1.   What are teachers' experiences of computer integration?

1.1. How much access do teachers have to computer technology?

1.2. How do teachers talk about computer use in classrooms, and what are the reasons for this use?

1.3. What are teachers' pedagogical beliefs and attitudes toward integrating computers into their teaching?

1.4. How well do teachers feel they are prepared to integrate computers into their instruction?

1.5. What are the factors that influence Palestinian public secondary teachers in integrating computer technology into their teaching?

1.6. What are the barriers that prevent teachers from using computers in their instruction?

2.   How does the Palestinian MoEHEE view computer technology?

2.1. How well does the MoEHEE policy match teachers' teaching practices?

2.2. What kind of support does the MoEHE provide to teachers to integrate computers effectively into education?

2.3. What strategies does the MoEHE implement to integrate computers into education?

2.4. What are possible strategies to help integrate computer technology effectively into schools?

3. What is the gap between the PEI goals and the current situation in schools?

3.1. What is known in the literature about methods of effective computer technology integration?

In chapter five of this study, I provided a detailed exploration of the PEI's vision and goals, and the practices of using computers in schools. In this chapter, I will identify the gap between the PEI's ambitions and computer technology practices in schools. Then, I will recommend ways to bridge the gap between the expectations and practices of computer integration. Finally, I will suggest further studies based on the results of this study.

6.2 The Gap between the PEI's Ambition, Goals and Practices of Using Computer Technology

The Palestinian Education Initiative (PEI) is part of Global Education Initiative (GEI) that was established in partnership with UNESCO and the Education For All Fast Track Initiative. The main objective of the GEI is to enrich education initiatives at the global, regional, and country levels through the establishment of multi-stakeholder partnerships involving the private sector. The ultimate goal of the initiative is to contribute to the objective of Education Development Strategic Plan (EDSP) 2008-2012 in improving the quality of education in Palestine and moving toward student-centered approach. PEI is not a policy on itself, but is as a platform

for building pilot practices based on contemporary best practices and fits to the Palestinian context. The problem with the Palestinian education as it was presented by PEI is that it still follows the traditional approach and therefore students are not prepared to live and compete in the knowledge-based world. The assumption of the PEI was based on the students' achievement on international large scale assessment like the TIMMS.

The ultimate goal of the PEI is to help improve the quality of teaching and learning. Quality according to the Ministry refers to curriculum qualities and curriculum should be reviewed and modified. The quality of the educational facilities and infrastructure, as well as the teaching and learning process, is another way the PEI defines quality. The teaching and learning process that the ministry is looking for is a learning environment where students are active learning and not depending on rote learning and memorization.

In this regard, computer technology is viewed as one of the main means of promoting an effective pedagogical shift. Computer technology plays three important roles in teaching and learning process according to PEI: it is an administrative tool, a learning content, and a learning resource. Grounded on this view, data were collected from Palestinian secondary schools to investigate the use of computer technology in teaching and learning process. The gap between PEI goals and school practices is presented as follows.

The effective integration of computers into the teaching and learning process is influenced and constrained by many conditions. These conditions are related to school technology resources, school culture, readiness, and the experiences of teachers in regards to computer technology. These conditions are interdependent, as was presented clearly in the findings chapter.

Studies have shown that having a plan with clear goals and a vision of how to use technology to achieve educational goals is one of the most important steps in achieving meaningful computer technology use (Kozma, 2005; Yusuf, 2005; Kozma, 2008). According to Ertmer 2009, (p. 54):

160

…[A] vision gives a place to start, a goal to reach for, as well a guidepost along the way …a shared vision offers a vehicle for coherent communication among all stakeholders (teacher, parents, students, administrators, community leaders, business partners). Thus, when new issues, problems or opportunities arise, our vision keeps us focused on what is central to our technology efforts.

The PEI's vision and goals for computer integration were not shared completely among teachers and supervisors. It is evident that the teachers support the PEI's views about computer technology as administrative tool and as a teaching content and that was reflected in supervisors' support. This clear evidence affected the ways teachers integrate computer technology. The role of computer technology as administrative tool is one of the roles that were mentioned by the PEI but it is not the main focus. Using computers as an administrative tool will not help change and shift the teaching and learning process.

The findings show that the Ministry made an effort to emphasize the role of computer technology as an administrative tool and for learning content more than its role as a learning resource. This was well-defined in the findings. All teachers confirmed that they were requested to use computer technology for non-instructional responsibilities like lesson planning, writing exam papers, track students' attendance and grades. The role of technology as learning content was also emphasized in that technology subject teachers were put in charge of the computer labs and priority was given to the technology subject teachers and students to access the computer lab. Supervisors' support was also focused on the first two roles, leaving the role of technology learning resource voluntary for teachers.

The lack of shared vision also caused a disturbance in applying the idea of the public-private partnership with cooperation among all different stakeholders. The public-private partnership, as I said before, requires a great deal of effort to keep the connection and communication open among them.

161

Findings of this study also have shown that teachers have positive attitudes towards computers in general and toward computer integration in education. I have also found that all teachers use computer technology for administrative purposes while some teachers use it in teaching. I think the disparity between the attitudes and practices for this matter are due to the conditions that were mentioned earlier, including the lack of a shared policy and goals.

The main reasons teachers gave for using technology in the classroom is that computer technology attracts students' attention, saves time during the presentation of lessons, and it is the emerging language of the new generation. Those reasons are signs that teachers are the main source of information for students and that these teachers look for ways to help them deliver knowledge to the students. The reason computers are not effectively integrated into schools, in addition to other challenges that were mentioned earlier, is due to the lack of understanding about how computer technology can be used to improve the quality of education and how it can enable a shift in the teaching and learning process toward the PEI's vision of a student-centered approach to learning. During interviews conducted with the teachers, many said that the type of training teachers get in computer technology mostly focuses on building their technology basic skills and does not train them in how to use computer technology as a pedagogical tool.

I was so pleased to see one track in the initiative that was specified for training and upgrading technology skills for teachers, principals, and educational managers. This is a key element to education reform, particularly if the initiative is looking to reform the education and move toward a student-centered paradigm. According to Kozma (2008), technology teacher training policies frequently spell out a specific set of skills that

teachers need to acquire, as well as the duration of training. Close examination of the PEI

shows it lacks a concrete process for how the training of teachers, principal and

supervisors will take place. For example, in the Second Information Technology in

Education Studies SITE[13] project (2006) all the policies or action plans that were

presented only taught the minimum skills necessary to use computers (Plomp, Anderson,

Law, & Quale, 2009). I think specifying ways to improve the competency of teachers in

the use of computer technology will help to organize future trainings and decrease the

disparity between the technical and pedagogical skills of the teachers.

It was evident from the quantitative and qualitative findings that there is lack of

support provided for this matter. One technician is hired for each educational directorate

to fix all computers in the schools, and teachers mostly rely on the technology subject

teachers to help them technically and pedagogically in the use of computers. The lack of

the internet connectivity in schools also restricts the use of computer technology to the

traditional method of education. Without the internet, computers are just machines and

their use is limited to a number of applications and software like Microsoft Office Word,

PowerPoint Presentations, and CDs. Those applications will not help teachers to use

computer technology innovatively and will help students acquire the necessary skills to

compete in the 21st century.

In conclusion, although the findings showed that there are some practices of using

computer technology in instructional and non-instructional way, they do not meet the

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[13] SITES is a research program focused on the comparative assessment of ICT use in education across many countries. Case studies of innovative pedagogical practices were also undertaken. SITES 2006 is the third project in the series. Countries covered in the third project are Australia, Canada (Alberta and Ontario), Chile, China (Taipei), Denmark, Estonia, Finland, France, Hong Kong Special Administrative Region of China, Israel, Italy, Japan, Lithuania, Norway, Russian Federation (Moscow), Singapore, Slovakia, Slovenia, South Africa, Spain (Catalonia), Thailand.

PEI's goals and vision for using computer technology to improve education. Based on the above findings, it can be inferred that the use of computer technology in Palestinian secondary schools is still oriented toward the traditional method of teaching, and is primarily being used for non-instructional purposes. In instructional use, computer technology is mainly seen used to create PowerPoint presentations. In this case most of the work is done by the teacher. There are some cases in which computer technology is integrated effectively into teaching but those cases are very limited.

6.3 Bridging the Gap

One of the motives of this study besides exploring computer integration in Palestinian secondary schools is to help integrate computer technology effectively into education. Based on the results that are found in this study, I provide some recommendations for how to encourage teachers to integrate technology in their teaching. Some of those recommendations were expressed by teachers and supervisors and some of them are based on my observations in this study.

Teachers and supervisors' recommendations are based on their experiences in teaching, training, and visiting schools. Some of the recommendations are related to the training, for which they recommend conducting trainings at a time that is convenient for the teachers and not to put it after school as some teachers indicated. Also they recommended that training should suite the needs and skills of the teachers and should not present material that is either below or above the teachers' skills and knowledge about technology. The most important is the follow-up after trainings; teachers need close support when they go to the classroom and implement what they have learned in the trainings. Otherwise teachers' enthusiasm for what they have learned will fade once the training is complete.

6.3.1 Supervisors and Teachers' Recommendations

Recommendation # 1- Define and Share Policies

It was apparent in the findings that the PEI's vision was not shared among all teachers, supervisors, and probably principals. Therefore I would encourage them to have a clear vision of how can computer technology be used to enable the shift toward student-centered approach and share it with all stakeholders. It is understandable that it is hard to gather all stakeholders and start talking about the PEI, but it would be possible of have several meetings or gathering and ask to disseminate that vision or idea among other stakeholders.

Recommendation #2 – Improve Technology Infrastructure

Teachers and supervisors also recommended improving technology infrastructure in schools by providing computers to teachers and installing computers in classrooms instead of all school focus on one computer lab.

Recommendation #3 – Provide Release Time for Technology Teachers to Conduct Professional Development

Quantitative and qualitative data in this study have shown that technology subject teachers are a great help to other teachers, and teachers may get more support from them than from supervisors. Therefore I would recommend increasing technology support to teachers by decreasing the class load of the technology subject teachers so they can have enough time to provide support to regular subject teachers whenever it is needed. This kind of support was documented in one school in which many teachers integrated computer technology into their classrooms.

Recommendation # 4- Increase Computer Access

Because of limited budgets in Palestinian schools, computer use is limited to administrative purposes and students' use of computers was limited to the technology class period. Teachers rarely got to use computer technology. To increase student and teachers' use of computers, schools should extend the use of computer lab to include periods before and after school.

6.3.2 Recommendation based on Research Findings

Recommendation # 1- Involve teachers in the Planning Process

Acknowledging that teachers play an important role in succeeding any new idea that related to teaching and learning, I would recommend involving teachers in establishing the vision for technology use in schools and any process of implementing that vision.

Recommendation # 2- Encourage Pre-service Teachers to Use Computer Technology

As Cuban (2001) indicated, teachers tend to teach the way they were taught. Most teachers today have never seen technology used in an innovative and imaginative way. These teachers use the computer at home more than in their schools Therefore I think preparing pre-service teachers to integrate technology is a great objective in the future of computer integration and teacher preparation.

As a part of teacher preparation, pre-service teachers will use computer technology for things like writing papers, searching for information, and collaborating with colleagues using computer technology. In addition to that, they will be encouraged to learn about and use computer technology and observe how professors are using that technology in for teaching and learning. This will encourage pre-service teachers to reflect on their experiences of observing and learning about the use of technology and

166

how computer technology can help and improve the teaching and learning process and how be used in the teaching the learning content for each subject. I have heard from several teachers and supervisors that they learned about computer technology from their university study. That been said, I would recommend close collaboration and work with universities so they encourage their faculty to use computer technology in their teaching.

Cuban (2001) and Bell and Tai (2003) indicated that a shift toward the use of computer technology in the classroom would take time. This was also indicated by supervisors in the interviews. So using computer technology throughout pre-service learning time and being exposed to technology integration in different way will help them gain computer knowledge and skills.

Recommendation #3- Increase Supervisors' Collaboration and Support

The role of supervisors and principals in the teaching and learning process is very important and their support for technology integration is no less, therefore I would encourage increasing collaboration with them and providing professional development in which they focus on ways to increase their support to teachers.

Recommendation# 4- Train Teachers to Use Computer Pedagogically

Teachers are competent in some of the basic skills for using computer technology. I think the Ministry needs to work harder to train the other teachers in getting the basic skills of computer technology. Hopefully Intel project will be able to train the other teachers, as its goals are to 12,000 teachers in developing their basic skills in computer technology. On top of that, teachers need to know how to use computer technology as a teaching tool to help change the teaching and process.

Recommendation # 5- Social Acceptance

Social acceptance was found as one of the challenges Palestinian teachers have during computer integration. Therefore, I would recommend having more open talks with parents to explain to them the benefits of using computer technology in education. These talks should clarify the point that computer technology, including the Internet, has benefits as well as risks and using computer at school will give the teachers a chance to help students use effectively and benefit from it.

6.4 Further studies recommendation

Based on the findings of this study, I would recommend those further studies.

1- Further studies are need to explore the curriculum changes that have been established and connect those changes to the ministry's goal of moving the teaching and learning process toward a student-centered approach

2- Computer technology is changing rapidly and there were projects of teacher training or others during the data collection like Model School Network (MSN) project and Intel training, and possibly other projects were implemented. Therefore, I would recommend further studies to explore their help in developing and improving teachers' skills and practices.

3- This study was conducted only in secondary schools in Ramallah, Al-bireh & Qalqilia, Azzon schools, so the results are only applicable to those regions. To get a better picture of what is happening in the rest of Palestinian schools, I would recommend further studies to be conducted in other cities and villages.

4- I would recommend further studies to look at PEI and other Ministry policy in regards to Globalization and modernization theories.

5- It was underlined by policy makers and by Shinn (2012) that there are dozens of ongoing projects at the MoEHE, so it would recommend further studies to explore donors' effect in designing and implementing the projects.

APPENDICES

APPENDIX A

SUMMARY OF RESEARCH QUESTIONS, DATA COLLECTION TOOLS, AND ANALYSIS METHOD

Overarching Study question: What are teachers' experiences of computer integration?							
Research inputs				Data collection activities		Analysis	Outputs
Study Questions	*Purpose of the question*	*Information needed to answer the question*	*Information Sources (Who has the information?)*	*Data Collection Strategies (Methods/ tools)*	*From whom?*	*Data Analysis Procedures*	
What is teachers' experience of computer integration?							
How much access do teachers have to computer technology?	This question seeks to define teachers' access to computer technology at schools	Questionnaire responses on "Access" F and G sections Teachers & supervisors' interviews	Teachers Supervisors	Survey Interviews	Teachers Supervisors	Qualitative analysis Descriptive analysis	*Overview of how much teachers have access to computer technology schools*
How do teachers talk about computer use in classrooms, and are there reasons for this use?	This question seeks to determine computer technology usage by teachers	Published literature on how computer technology can be used in classrooms Teachers' answers during interviews	Published article Qualitative interviews Collected martials	Interviews Document analysis Desk review	Teachers School visits Research data base	Qualitative analysis	*Snapshots of how computer technology is being used in schools*

Study Questions	Purpose of the question	Information needed to answer the question	Information Sources (Who has the information?)	Data Collection Strategies (Methods or tools)	From whom?	Data Analysis Procedures	
What are teachers' pedagogical beliefs and attitudes toward integrating computers into their teaching?	This question seeks to determine how teachers view and believe in computer technology	Questionnaire section B responses Teachers/ supervisors' interview responses Published Literature	Questionnaire Interview data Journals	Survey Interviews Desk review	Teachers Supervisors Research data base	Qualitative analysis Quantitative analysis	*Palestinian teachers' beliefs and attitudes about computer technology*
How well do teachers feel they are prepared to integrate computers into their instruction?	This question seeks to determine teachers' readiness to integrate computers into their teaching	Published Literature	C section Questionnaire data Interview data journal	Survey Interviews Desk review	Teachers Research data base	Meta-analysis Quantitative analysis	List of competence skills that teachers have List of skills that teacher need to integrate computer technology effectively

Study Questions	Purpose of the question	Information needed to answer the question	Information Sources (Who has the information?)	Data Collection Strategies (Methods or tools)	From whom?	Data Analysis Procedures	
What are the factors that influence Palestinian public secondary teachers in integrating computer technology into their teaching?	This questions seeks to determine teachers' reasons for integrating computer integration into education	Published literature Data from Survey Interview responses	Questionnaire Data From Teacher Interviews	Survey Interviews	Teachers Policy makers Supervisors	Meta-analysis Open ended qualitative analysis	Determining the reason for integrating computer (whether they really integrate)
What are the barriers that hinder teachers from using computers into their instruction?	This question seeks to examine the list of barriers that prevent teachers from integrating computer technology	Published Literature Interview responses	Questionnaire data (section E) Interview data Document analysis data	Survey Interviews PEI	Teachers Supervisors Policy makers Document	Quantitative analysis Document analysis Qualitative analysis	List of challenges that prevent teachers form integrating computer technology
How does the Palestinian MoEHE view computer technology?							

How well does the policy match teachers' teaching practices?	This questions seeks to investigate how computer integration as appears in the PEI suits and accepts technology integration in the Palestinian education system	Published literature on educational technology plans and policies Policy makers' perceptions and views on computer technology in education.	WWW Journals Policy makers Palestinian Education Initiative (PEI)	Document review Interviews	Palestinian Education Initiative (PEI) Policy makers interviews	Meta-analysis Document analysis Inductive analysis.	*Clear picture of ICT position in Palestinian education*
What kind of support does the MoEHE provide to teachers to integrate computers effectively into education?	This questions seeks to determine the support that MoEHE provide to enhance computer technology integration	Published literature on kid of supports. Published success stories on effective compute technology integration. Policy makers' references provided support.	WWW Journals Books PEI Policy makers D section data from the questionnaire	Document review Interviews Survey	PEI Policy makers Teachers Supervisors	Inductive analysis Quantitative analysis Meta-analysis	*List of encouragements and assistance the Ministry offers to employ computer technology into education*
What strategies does the MoEHE implement to integrate computers into education?	This questions seeks to investigate strategies (if there), MoEHE is implementing to integrate computer technology into education	Published Literature Evaluation or reports from other experiences	Interview data PEI Journals	Interviews Document analysis	Stakeholders (meso, micro, macro level)	Qualitative analysis of open ended questions	*List of supports that MoEHE provide to teachers* *List of support that teachers are needed*

What are the possible strategies that help integrate computer technology effectively into schools?							
What is the gap between PEI Initiative goal and the current situation?	This question seeks to identify the gap between PEI and the current situation	Survey data Interview data Document analysis data	Teachers PEI document Policy makers supervisors	Interviews Survey Document analysis	Teachers Policy makers Supervisors PEI	Qualitative analysis of open ended questions Quantitative analysis	*Clear understanding of the current situation in schools*
Overarching Study question: What are teachers' experiences of computer integration?							
Research inputs				**Data collection activities**		**Analysis**	**outputs**
Study Questions	***Purpose of the question***	***Information needed to answer the question***	***Information Sources (Who has the information?)***	***Data Collection Strategies (Methods or tools)***	***From whom?***	***Data Analysis Procedures***	
What is teachers' experience of computer integration?							
How well do teachers have access to computer technology?	This question seeks to define teachers' access computer to computer technology at schools	Questionnaire responses on "Access" F and G sections Teachers & supervisors' interviews	Teachers Supervisors	Survey Interviews	Teachers Supervisors	Qualitative analysis Descriptive analysis	*Overview of how much teachers have access to computer technology schools*

How do teachers talk about computer use in classrooms, and are there reasons for this use?	This question seeks to determine computer technology usage by teachers	Published literature on how computer technology can be used in classrooms Teachers' answers during interviews	Published article Qualitative interviews Collected martials	Interviews Document analysis Desk review	Teachers School visits Research data base	Qualitative analysis	Snapshots of how computer technology is being used in schools

Integrating Computers into Palestinian schools

You are being invited to participate in teacher- secondary school survey on Integrating Computers into Palestinian Schools. This is an exploratory study that seeks to understand the current situation in Palestinian secondary schools regarding computer integration. The survey includes questions about attitudes and beliefs toward computers generally and integrating computers into teaching specifically, as well as teachers' computer competence levels, the kinds of support that teachers get to help them integrate computers into teaching, and barriers to effective computer integration in schools. The data of this survey will help provide a better understanding of the current situation in Palestinian schools in terms of integrating computers, besides this research will contribute to the literature on technology integration generally and for developing country context specifically. The survey should take less than 30 minutes.

☐ I CONSENT TO PARTICIPATE IN THIS SURVEY.

By agreeing with the statement above, you understand that

- Participation is voluntary. At any time you can choose to end your participation, or skip questions you don't want to answer.
- All responses will be kept confidential.
- You can contact the University Of Massachusetts School Of Education Institutional Review Board/IRB. I can reach the IRB by calling (413) 545-1056 or I can write to the School of Education, University of Massachusetts, 813 North Pleasant Street, Amherst, Massachusetts 01003

A. Attitudes and beliefs toward computer in general

Please indicate your reaction to each of the following statements by circling the number that represents your level of agreement or disagreement with it.

		Agree	Neutral	Disagree
CI01	Computers do not scare me at all	1	2	3
CI02	Computers make me uncomfortable	1	2	3
CI03	I am glad there are more computers these days	1	2	3
CI04	I don't like talking with others about computers	1	2	3
CI05	Using computers is enjoyable	1	2	3
CI06	Computers save time and effort	1	2	3
CI07	Learning about computers is a waste of time	1	2	3
CI08	Computers are fast and efficient mean in getting information	1	2	3
CI09	Computers do more harm than good	1	2	3
CI10	I would rather do things by hand than with a computer	1	2	3
CI11	I would avoid computers as much as possible	1	2	3
CI12	I would like to learn more about computers	1	2	3
CI13	I have no intention to use computers in the near future	1	2	3
CI14	I have no difficulty in understanding the basic functions of computers	1	2	3
CI15	People who are skilled in computers have privileges not available to others	1	2	3
CI16	Computers encourage unethical practices	1	2	3

B. Attitudes and beliefs toward using computer into education

Please indicate your reaction to each of the following statements by circling the number

		Agree	Neutral	Disagree
	that represents your level of agreement or disagreement with it			
CI17	Computer use can enhance students' learning	1	2	3
CI18	Computer use should be one of the priority in education	1	2	3
CI19	Schools will be better without computers	1	2	3
CI20	I do not think I will need computer in classroom	1	2	3
CI21	Computers would motivate students' learning	1	2	3
CI22	Computers would encourage students to do more study	1	2	3
CI23	Teaching with computers offers real advantages over traditional methods of instruction	1	2	3
CI24	Computer technology can't improve the quality of students' learning	1	2	3
CI25	Using computers technology in teaching would make the subject matter more interesting	1	2	3
CI26	Computer use fits well into curriculum goals	1	2	3
CI27	Computer use suits my students learning preferences	1	2	3
CI28	It would be hard for me to learn to use the computer in teaching	1	2	3
CI29	Computer complicate my task in the classroom	1	2	3
CI30	Computers have proved to be effective learning tools worldwide	1	2	3
CI31	Computers will not make any difference in our classrooms, schools, or lives	1	2	3
CI32	Students need to know how to use computers for their future jobs	1	2	3
CI33	There are other social issues that need to be addressed before implementing computers in	1	2	3

		Much Competence	**Moderate Competence**	**Little Competence**
C. Computer Competency level Please indicate your current computer competency level regarding each of the following statement				
CI37	Install new software on a computer	1	2	3
CI38	Use printer	1	2	3
CI39	Use a computer keyboard	1	2	3
CI40	Operate word processing program (e. g., word)	1	2	3
CI41	Operate a presentation program (e g., Power Point)	1	2	3
CI42	Operate a spreadsheet program (e. g., Excel)	1	2	3
CI43	Operate a graphics program (e. g., Photoshop)	1	2	3
CI44	Use the Internet for email	1	2	3
CI45	Communicate with others like chatting	1	2	3
CI46	Use the World Wide Web to access different types of information	1	2	3
CI47	Using computer to evaluate students' learning outcomes and grade keeping	1	2	3
CI48	Create and organize computer files and folders	1	2	3
CI49	Using computer to collaborate with other teachers	1	2	3

			Yes	No
	Please indicate whether or not you use each of the following to gain computer- related information			
CI50	self- taught		1	2
CI51	conferences		1	2
CI52	workshops and training programs- on your own time		1	2
CI53	workshops offered through school and school districts		1	2
CI54	courses offered in colleges(continuing education centers)		1	2

D. **Support:**

Please indicate if you have the support in each of the following items. **If yes**, then **who** offers that support?

				Person who provide the support			
		Yes	No	Technology Teacher	Principal	Supervisor	Colleagues
CI55	Use of computer	1	2	1	2	3	4
CI56	Use of the Internet	1	2	1	2	3	4
CI57	Technical support	1	2	1	2	3	4
CI58	Locating software	1	2	1	2	3	4

		Yes	No	Do not Know
CI59	Does your district or school provide you the opportunity to observe colleagues teaching lessons that integrate technology in curriculum?	1	2	3
CI60	In the past 5 years, have you participated in a training workshop related to using computers in teaching?	1	2	3

IF YES in CI160, Which of the following types of incentives made you participate in the training?

		Yes	No	Do Not Know
CI61	School provides release time from			

	classes or other responsibilities	1	2	3
CI62	Expenses are paid	1	2	3
CI63	Stipends are provided	1	2	3

E. **Barriers to Computer Integration**

Please indicate to what extent, if any the following are barriers to integrate computers into instruction

		Major Barrier	**Minor Barrier**	**Not a Barrier**
CI64	Not enough computers	1	2	3
CI65	Outdated, incompatible, or unreliable computers	1	2	3
CI66	Internet access is not easily accessible	1	2	3
CI67	Lack of good instructional software	1	2	3
CI68	Inadequate training opportunities	1	2	3
CI69	Lack of free time for teachers to learn/ practice/plan ways to use computers or the Internet	1	2	3
CI70	Lack of administrative support	1	2	3
CI71	Lack of supervisor support regarding ways to integrate technology into the curriculum	1	2	3
CI72	Lack of technical support or advice	1	2	3
CI73	Lack of time in schedule for students to use computers in class (period time is not enough)	1	2	3
CI74	Concern about student access to inappropriate material	1	2	3
CI75	Too much curriculum to cover	1	2	3
CI76	Other, please specify: ………………………………………………………………….			

F. **Computer Information:**

		Yes	No
CI77	Do you have computers available for students to use in your classrooms?	1	2
CI78	If Yes in CI177, How many ………………………………………………………		
CI79	Are they connected to the Internet?	1	2
CI80	Does your school have a computer lab?	1	2
CI81	If yes in CI180, is it connected to Internet?	1	2

G. Computer access

Please identify how often you have computer access in the following context:

		Daily	2 or 3 times a week	Once a week	Once a month	Never
CI82	In your home	1	2	3	4	5
CI83	At school (computer lab or library)	1	2	3	4	5
CI84	Other (like Internet cafes, etc.)	1	2	3	4	5

H. Demographic Information

CI85	Are you a: 1- Male 2- Female
CI86	Age? ………………………………
CI87	Highest earned degree? 1- 2 years college 2- Bachelor 3- Masters or above
CI88	Years have you been a teacher? ………………………………………..
CI89	Grade(s) you teach? 1- 10th grade 2- 11th grade 3- 12th grade
CI90	Subject(s) you teach? …………………………………………………
CI91	Name of the school: …………………………………………..
CI92	Education Directorate: ……………………………………….

CI93	As a classroom teacher, what suggestions do you have for the teacher preparation program concerning teaching with technology? …………………………………………………………………. ……………………………………………………………………………………

Thanks for your participation

QUESTIONNAIRE IN ARABIC LANGUAGE

أنت مدعو للمشاركة في مسح معلمي المدارس الثانوية "حول دمج الحاسوب في المدارس الثانوية الفلسطينية".

هذا البحث عبارة عن دراسة استكشافية هدفها فهم الوضع الحالي لدمج الحاسوب في المدارس الفلسطينية. حيث تتضمن

الاستبانة أسئلة عن التوجهات والمعتقدات المتعلقة بالحاسوب بشكل عام، وحول دمج الحاسوب في التدريس وبالتحديد مستوى

المعرفة باستخدام الحاسوب لدى المعلمين، وأشكال الدعم الذي يتلقونه للمساعدة في عملية الدمج، وكذلك عن معوقات دمج

الحاسوب في التدريس.

إن هذا المسح سوف يساهم في توفير مادة بحثية حول إدماج التكنولوجيا بشكل عام وفي الدول النامية بشكل خاص.

وقت تعبئة الاستمارة لا يتعدى 30 دقيقة.

أوافق على تعبئة هذه الاستبانة.

إن تعبئتك لهذه الاستبانة تعني أن المشاركة طوعية في هذا البحث، وبإمكانك التوقف عن تعبئة هذه الاستبانة متى شئت أو

عدم الإجابة عن بعض الأسئلة إذا ما اخترت ذلك. وسرية البيانات مضمونة وسوف تعامل الإجابات بسرية تامة.

إذا كانت لديك أية تساؤلات، بإمكانك الاتصال على معهد المراجعة والتحكيم في جامعة ماساتشوستس على رقم 545-413

1056، أو يمكنك مراسلة كلية التربية في جامعة ماساتشوستس, على العنوان التالي:

813 North Pleasant Street, Amherst, Massachusetts 01003.

جامعة ماساتشوستس

دمج الحاسوب في المدارس الثانوية الفلسطينية

تعليمات عامة: تعبأ هذه الاستمارة من قبل معلمي المدارس الحكومية الثانوية في الأراضي الفلسطينية، التي لديها مختبر حاسوب أو تستخدم الحواسيب في الغرف الصفية. تتكون هذه الاستبانة من 8 أقسام، يبدأ كل قسم ببعض التعليمات التي تخص ذلك القسم فقط. قبل أن تبدأ الإجابة على كل قسم الرجاء قراءة التعليمات بدقة ثم الإجابة بصراحة حسب الشكل المطلوب.

	القسم الأول: A توجهات وانطباعات معلمي المدارس

		الرجاء وضع دائرة حول الرقم الذي يحدد مدى موافقتك أو عدم موافقتك مع كل عبارة من العبارات التالية

غير موافق	محايد	موافق		
3	2	1	لا يخيفني الحاسوب أبدا	CI01
3	2	1	لا أشعر بالارتياح تجاه الحاسوب	CI02
3	2	1	أنا سعيد لتوفر الحاسوب بكثرة هذه الأيام	CI03
3	2	1	لا أحب التحدث مع الآخرين عن الحاسوب	CI04
3	2	1	استخدام الحاسوب شيء ممتع	CI05
3	2	1	يوفر الحاسوب الوقت والجهد	CI06
3	2	1	تعلم الحاسوب مضيعة للوقت	CI07
3	2	1	الحاسوب وسيلة سريعة وفعالة للحصول على المعلومات	CI08
3	2	1	يضر الحاسوب أكثر مما ينفع	CI09
3	2	1	أفضل أن أعمل الأشياء بيدي على أن أعملها بالحاسوب	CI10
3	2	1	سأحاول تجنب الحاسوب قدر المستطاع	CI11
3	2	1	أود تعلم المزيد عن الحاسوب	CI12
3	2	1	لا أنوي استخدام الحاسوب في المستقبل القريب	CI13
3	2	1	لا أجد أية صعوبة في فهم الوظائف التقنية للحاسوب	CI14
3	2	1	يستأثر ذوو المهارة بالحاسوب على مزايا لا يحصل عليها غيرهم	CI15
3	2	1	يشجع الحاسوب على انتشار اللاأخلاقيات	CI16

القسم الثاني: B توجهات وانطباعات معلمي المدارس تجاه استخدام الحاسوب في التدريس			
الرجاء وضع دائرة حول الرقم الذي يحدد مدى موافقتك أو عدم موافقتك مع كل عبارة من العبارات التالية			
غير موافق	محايد	موافق	
3	2	1	سوف يحسن الحاسوب التعليم	CI17
3	2	1	الحاسوب يجب أن يكون من أولويات التعليم	CI18
3	2	1	ستكون المدارس أفضل بدون الحاسوب	CI19
3	2	1	لا أظن أنني سأحتاج الحاسوب في الصف أبدا	CI20
3	2	1	يعزز الحاسوب تعلم الطلاب	CI21
3	2	1	يحفز الحاسوب الطلاب على مزيد من الدراسة	CI22
3	2	1	يمنح التدريس باستخدام الحاسوب حقيقية أكثر من الطرق التقليدية	CI23
3	2	1	لا يمكن لتقنية الحاسوب أن تحسن نوعية تعلم الطلاب	CI24
3	2	1	استخدام تقنية الحاسوب في التدريس يجعل المادة التعليمية أكثر تشويقا	CI25
3	2	1	يتوافق استخدام الحاسوب تماما مع أهداف المنهاج الدراسي	CI26
3	2	1	يتناسب استخدام الحاسوب مع ميول طلابي التعليمية	CI27
3	2	1	من الصعب علي تعلم استخدام الحاسوب في التدريس	CI28
3	2	1	الحاسوب يجعل مهمتي في الصف أكثر تعقيدا وصعوبة	CI29
3	2	1	أثبت الحاسوب أنه وسيلة تعليمية فعالة على مستوى العالم	CI30
3	2	1	لن يغير الحاسوب شيئا في صفوفنا أو مدارسنا أو حياتنا	CI31
3	2	1	يحتاج الطلاب إلى معرفة استخدام الحاسوب في مهنهم المستقبلية	CI32
3	2	1	هناك الكثير من المسائل الاجتماعية التي يجب التطرق إليها قبل تطبيق الحاسوب في التعليم	CI33
3	2	1	للحاسوب قدرة على خلق أجواء تساعد الطلاب في حل المشاكل الدراسية	CI34
3	2	1	يساعد الحاسوب الطلاب على التعاون مع الآخرين	CI35
3	2	1	يساعد الحاسوب الطلاب على الابتكار مثل تصميم مواقع الكترونية أو نشرات اعلامية	CI36
القسم الثالث: C مستوى المعرفة باستخدام الحاسوب			
الرجاء وضع دائرة حول الرقم الذي يحدد مستوى معرفتك ومهارتك باستخدام الحاسوب مع كل عبارة من العبارات التالية			
غير موافق	محايد	موافق	
3	2	1	تحميل برنامج جديد على الحاسوب	CI37

		1	2	3
CI38	استخدام الطابعة	1	2	3
CI39	استخدام لوحة المفاتيح	1	2	3
CI40	تشغيل برنامج معالجة النصوص (مثل وورد، Win word)	1	2	3
CI41	تشغيل برنامج عرض الشرائح (مثل بور بوينت، Power point)	1	2	3
CI42	تشغيل برنامج جداول البيانات (مثل إكسل، Excel)	1	2	3
CI43	تشغيل برنامج رسومات (مثل فوتوشوب، Photo shop)	1	2	3
CI44	استخدام الشبكة العالمية (الانترنت) من أجل البريد الالكتروني	1	2	3
CI45	استخدام الشبكة العالمية (الانترنت) للاتصال مع الآخرين مثل غرف الدردشة (Chatting)	1	2	3
CI46	استخدام الشبكة العالمية (الانترنت) للوصول إلى معلومات مختلفة	1	2	3
CI47	استخدام الكمبيوتر لتقييم نتائج تعلم الطلاب وحفظ العلامات	1	2	3
CI48	انشاء الملفات وتنظيمها على الحاسوب	1	2	3
CI49	استخدام الحاسوب للتعاون مع المدرسين الآخرين	1	2	3

يرجى الإجابة ب (نعم، لا) عن استخدامك لكل من العناصر التالية للحصول على المعلومات ذات الصلة بالحاسوب

		نعم	لا
CI50	التعلم الذاتي	1	2
CI51	المؤتمرات	1	2
CI52	ورش العمل ودورات تدريبية في وقتك الخاص وجهدك الذاتي	1	2
CI53	ورش العمل وبرامج التدريب التي تنظم من قبل المدرسة أو الوزارة	1	2
CI54	دورات ومساقات مقدمة من الجامعات ومراكز التعليم المستمر	1	2

القسم الرابع: D الدعم المقدم للمدرسين

يرجى الإجابة ب (نعم، لا) حول توفر الدعم لكل مما يلي: (إذا كانت الإجابة بنعم الرجاء تحديد الشخص الذي يوفر الدعم)

		نعم	لا	الشخص الذي يوفر الدعم			
				معلم الحاسوب	المدير	المشرف التربوي	الزملاء
CI55	استخدام الحاسوب	1	2	1	2	3	4
CI56	استخدام الانترنت	1	2	1	2	3	4
CI57	الدعم التقني (الفني)	1	2	1	2	3	4
CI58	بحث واختيار برامج الكترونية تربوية	1	2	1	2	3	4

		نعم	لا	لا أعرف	

لا أعرف	لا	نعم	هل تقوم المدرسة (مكتب التربية) بتوفير فرص تسمح لك بمشاهدة حصص صفية يستخدم فيها الحاسوب للتدريس؟	CI59
3	2	1		
3	2	1	خلال الخمس سنوات السابقة هل شاركت في ورشات عمل تتعلق باستخدام الحاسوب في التدريس؟ (إذا كانت الإجابة ب لا الرجاء الانتقال إلى CI64)	CI60

إذا كانت الإجابة على CI60 ب نعم، أي من الحوافز التالية دفعتك للمشاركة في التدريب؟

لا أعرف	للا	نعم		
3	2	1	المدرسة تعفيك من الحصص الصفية والواجبات الأخرى خلال فترة انعقاد التدريب	CI61
3	2	1	نفقات الورشة مغطاة	I62
3	2	1	وجود مكافأة مالية للمشاركة في الورشة	CI63

القسم الخامس: E معوقات أمام دمج الحاسوب في التعليم

يرجى الإجابة على مدى وجود المعوقات التالية أمام دمج الحاسوب في التعليم:

لا ينطبق	لا تشكل عائقا	عائق ثانوي	عائق رئيسي		
4	3	2	1	لا يوجد عدد كاف من الحواسيب	CI64
4	3	2	1	الحواسيب قديمة غير ملائمة للبرامج الحديثة	CI65
4	3	2	1	محدودية توفر الانترنت	CI66
4	3	2	1	قلة توفر البرامج التعليمية المحوسبة	CI67
4	3	2	1	عدم ملاءمة الدورات التدريبية المتاحة	CI68
4	3	2	1	كثرة الأعباء التدريسية لا تسمح بتعلم/ ممارسة استخدام الحاسوب أو الانترنت	CI69
4	3	2	1	قلة الدعم الإداري من الجهات الرسمية	CI70
4	3	2	1	قلة الدعم من المشرفين لايجاد طرق تعليمية لدمج الحاسوب في المنهاج	CI71
4	3	2	1	قلة الدعم والارشاد الفني	CI72
4	3	2	1	الوقت المتاح في جدول الطلاب غير كاف (وقت الحصة لا يكفي)	CI73

		1	2	3	4
CI74	الخوف من دخول الطلاب إلى بعض المواقع غير الملائمة	1	2	3	4
I75	المنهاج طويل	1	2	3	4
CI76	أخرى، حدد/ي..				

القسم السادس: F معلومات لها علاقة بالحاسوب			

		نعم	لا
CI77	هل تتوفر حواسيب في الغرف الصفية لاستخدام الطلاب؟	1	2
CI78	إذا كانت الإجابة بنعم على CI77، كم عددها؟..		
CI79	هل الحواسيب موصولة مع شبكة الانترنت؟	1	2
CI80	هل يتوفر لدى المدرسة مختبر حاسوب؟	1	2
CI81	إذا كانت الإجابة بنعم على CI80، هل الحواسيب موصولة بالانترنت؟	1	2

القسم السابع: G توفر الحاسوب للاستخدام					

الرجاء تحديد عدد المرات التي تستطيع فيها الوصول إلى الحاسوب في كل من الأمكنة التالية:

		يوميا	2-3 مرات في الأسبوع	مرة في الأسبوع	مرة في الشهر	أبدا
CI82	في المنزل	1	2	3	4	5
CI83	في المدرسة (مختبر الحاسوب أو المكتبة)	1	2	3	4	5
CI84	في أمكنة أخرى (مثل مقاهي الانترنت...الخ)	1	2	3	4	5

القسم الثامن: H البيانات الديمغرافية	

CI85	الجنس؟ 1. ذكر 2. أنثى
CI86	العمر؟..
CI87	المستوى التعليمي؟ 1. دبلوم 2. بكالوريوس 3. ماجستير فأعلى
CI88	عدد السنوات التي قضاها المعلم في سلك التعليم؟..
CI89	ما هي الصفوف التي تدرسها؟ 1. العاشر 2. الحادي عشر 3. الثاني عشر
CI90	ما هي المواضيع التي تدرسها؟..

CI91	اسم المدرسة..
CI92	اسم التجمع..
CI93	ما هي اقتراحاتك لبرامج إعداد المعلمين لدمج استخدام الحاسوب في التدريس؟.. ....

APPENDIX D

PERMISSION LETTER

تقوم الطالبة كفاح برهم بإعداد دراسة تتعلق بدمج الحاسوب في المدارس الثانوية الفلسطينية، وذلك

استكمالا للحصول على درجة الدكتوراه في التربية من جامعة ماستشيوستس، أمهرست في الولايات المتحدة الأمريكية. يرجى

تسهيل مهمة الطالب وتقديم المساعدة الممكنة لها.

Kefah Barham is a doctoral Student at Center for International Education at University of

Massachusetts Amherst. She is conducting a research study on computer integration into

Palestinian secondary schools. Please facilitate her mission in collecting data.

Gretchen B. Rossman, PhD

Faculty Member

Center for International Education

INFORMED CONSENT PART II:

PARTICIPANT'S RIGHTS

Principal Investigator: <u>Kefah Barham</u>

Research Title: "<u>Integrating computers into Palestinian Schools.</u>

- I have read and discussed the Research Description with the researcher. I have had the opportunity to ask questions about the purposes and procedures regarding this study.

- My participation in research is voluntary and without financial compensation. I may refuse to participate or withdraw from participation at any time.

- The researcher may withdraw me from the research at her professional discretion.

- If, during the course of the study, significant new information that has been developed becomes available which may relate to my willingness to continue to participate, the investigator will provide this information to me.

- Any information derived from the research project that personally identifies me will not be voluntarily released or disclosed without my separate consent, except as specifically required by law.

- If at any time I have questions regarding the research or my participation, I can contact the investigator, who will answer my questions. Her email address is kbarham@educ.umass.edu

- If at any time I have comments, or concerns regarding the conduct of the research or questions about my rights as a research subject, I should contact the University of Massachusetts, School of Education Institutional Review Board/IRB. I can reach the IRB by calling (413) 545-1056 or I can write to the School of Education, University of Massachusetts, 813 North Pleasant Street, Amherst, Massachusetts 01003.

- I should receive a copy of the Research Description and this Participant's Rights document.

- If video and/or audio taping is part of this research, I (   ) consent to be audio/video taped. I   (   ) do NOT consent to being video/audio taped.

- Written, video and/or audio taped materials (   ) may be viewed in an educational setting outside the research, (   ) may NOT be viewed in an educational setting outside the research.

- **My signature means that I agree to participate in this study.**

Participants signature: _____ Date: _____

Name: _____

APPENDIX F

PROTOCOL FOR TEACHER INTERVIEW

Section A: Mainly this section is aiming to explore teachers' use of computers.

1- Let me start this interview by asking what grades do you teach and for which subjects?

2- How long have you been teaching in this school?

3- And before that, did you work in different school?

4- How many students do you have in your classes?

5- Do you have computers inside classrooms?

   - If yes, do you use computer inside classroom?

   - If yes, how

   - What is your role when students you computers inside classes?

   - If No, do you have computer lab in your school?

   - If yes, do you take the students to the lab to use computers?

   - If yes, how often

6- In the times that you use computer in teaching, how the structure of class does change?

7- How to you apply computers in the classroom practices, in other word, how do you assign students to use computers in the classroom?

8- Since when did you start using computers for teaching?

9- Do you use computers for planning lessons or for administrative work?

10- Do students get a specific course related to teaching them about computers?

Section B: This section is mainly exploring teachers' attitudes and beliefs toward using computers into teaching.

1- What kind of instructional software do you know?

2- Do you use it in class?

3- From where did you learn or know about these instructional strategies?

4- What kind of training or professional development that you took relates to computer integration?

5- Do you collaborate with other teachers either in this school or in other schools to use and integrate computers into teaching?

6- Does the school here encourage the use of computers,

   - If yes, how?

7- Could you please tell me why did you choose to use computers in your teaching?

   - If the teacher does not use computer, could you please tell me why you don't use computers in your teaching?

8- What do you think the benefits from using computers?

9- What kind of skills that students develop while using computers?

10- What changes do you think using computers may bring to the classroom?

11- Do you think students' level of engagement differs from the time using computers to times you are not using it? Or how do you students feel in the times that use computer?

12- What kind of concerns that you have when you use computers?

13- From your experience why do you think some teachers still not ready to use this new instruction in the classroom?

Section C: this interview is going to explore factors that influence teachers in integrating computers in their teaching.

1- How many classes do you teach per day or week?

   - Do you think this load is too much for you and needs a lot of time for planning?

2- Did you get any training from school relates to technology?

3- Do you think lack of professional training can hinder you or teachers generally about using computers?

4- Do you think there is enough flexibility in the curriculum to encourage you to integrate computers?

5- Do you think students are ready to use computers and this may encourage you to use computers?

6- If there are students in your class that who are not ready to use computer, how do you deal with them and does this affect your decision in using computers?

7- Do you think fixed class time hinders you from integrating computers?

8- How about accessibility and having the resources you need to integrate computers, do you think having all the resources may encourage you to integrate computers?

9- What problems do you face when using computers?

10- What recommendations you have for effective use of computers?

APPENDIX G

INTERVIEW GUIDE (SUPERVISOR & POLICY MAKERS)

View and attitudes

I. How long have you been serving as …………

   -   What your current view about the role of computers in teaching?

   -   Have this changed? How and why have your view changed?

II. What does "computer integration" means to you?

III. What expectations do you think the teachers have regarding using computers in their teaching?

   Support:

IV. Does the ministry have specific policy or strategy regards to integrating computers into education system?

   -   If yes, what types of policy you have?

   -   What kind of technology tools that the ministry is considering very important in the policy?

V. Does the ministry encourage the universities to have courses to help the pre services teachers be ready to use computers in teaching when they become teachers? How is that

VI. What kind of training does the ministry provides for in service teachers relates to using computers into teaching?

   Infrastructure and resources:

   Right now, can you give me an idea the status of the schools in regards to technology infrastructure?

   -   Computer labs

   -   Internet connections

   -   Technical support

   -   Teacher training

VII. What are some of the challenges that you and others face in regards to integrate computers into classroom

APPENDIX H

EXAMPLE OF UNIT BREAK

كفاح:	هل بتعتقد انه طبعا اذاً انت حكيت اجوابة بطريقة ثانية بتعتقد انها قلة الدورات هاي بتحد من استخدام المعلم، بس هاي مش منطبقة عليك معلش؟
مدرس:	لأ انا في ممكن غيري بس في ناس بيخذوا دورات بحكيلك في عنا 10 او 12 استاذ قبل فترة لسه، غير الـ ICDL اخذوا دورة هون بالمركز اللي جنبنا طبعا على حسابهم، ليش؟ لأنه بده يتابع بهاي الشغلة بس مش كفاية انه بروح يوخذ دورة ويوقف، بده تشجيع، كمان في ناس بقولك انا ما بقدر اشتري واجيب جهاز عندي عاليبت وما بقدر اشبك نت لانه في النهاية برجع المردود المادي بحكمه، وهاي مشكلة اذا احنا بدنا نرفع مستوى التعليم في اي بلد المفروض تكون الوسائل متوفرة، يكون المعلم حتى مرتاح ما يروح بعد المدرسة يدور على شغل ما واحد، يعني احكيلك كل الاساتذة بحكي عن الاساتذة تقريبا 80% بروح يشتغل لانه متزوج عنده اولاد، اولاد بالمدرسة، اولاد بالجامعة ما بقدر يعبلهم او يصرف عليهم، بـ 2000 او 3000 شيكل يا دوب يكفو مواصلات وخبز بس، وهاي مشكلة وهاي بتحد مثلا يعني اذا بدنا نتطلع على غيرنا برّه موفرله كل اشي وكثير شغلات مثلا ممكن تكون له مجانية او عليها نحكي مثلا خصومات بس احنا لأ، كله برجع بالنهاية العقبة الرئيسة اللي هي المال والمردود المالي في كل اشي بالذات بالتعليم ما بس باستخدام الحاسوب يعني مثلا استاذ بقولك ماشي بروح عالحصة بس يروح يأسان نحكي بصراحة بروح يأسان

هل وقت الحصة الدراسية اللي هي 40 او 45 دقيقة هل بتعتقد انها كافية للفترة اللي انت بدك تستخدم الكمبيوتر فيها؟

	اكيد لأ اذا بدي استخدم اكمبيوتر لأ، يعني مثلا في درس المفروض يعني هو المشكلة كمان تقطيع الدرس يعني مثلا بعطي اليوم جزء بكره جزء، في دروس بتوخذ اربع او خمس حصص، لأ يعني ممكن انه بعض الاحيان انه ليش ما نوفر او اكون اشي مدروس انه مثلا الحصة هاي بتلزمني كذا يكون حصتين ورا بعض او يكون مجال ساعة ونص زي كيف نظام الجامعات مثلا يكون بهاي الطريقة
	وطبعا انت ذكرتها بديش ارد اعيد السؤال انك ذكرتها مفش مصادر كمبيوتر فش انترنت فبالتالي هاي بتعيق؟
مدرس:	اكيد بتعيق فمش كل واحد قادر انه يجيب نت لانه النت بده مبلغ مش يعني هي كمان بتأثر على استخدام الحاسوب.
كفاح:	الاجهزة اللي بجيبولكم اياها هي بتكون فيها بعض الـ Programs مثل الـ Words مثل ... **مدرس:** هاي احنا بنزلها عالاجهزة هون. **كفاح:** يعني بعطوكم بدون برامج؟
مدرس:	اه، الجهاز حتى هذول الاجهزة السنة اللي مرقت جداد جبناهم فاضي فش فيه حتى مش منزل عليه Windows. فطبعا بمساعدة الاساتذة اللي نزلوا عليهم

Importance of computer   How computer is being used   Where computer is being used   When he/she started using computer Ways of using computer Reasons for integrating computer Support from Supervisors Programs that teachers know How teacher learn to use computer   From where teacher get the support to use computers Who encouraged teacher to use computers Why there are some teachers not convinced in using computer technology Ways to encourage teachers Challenges Teacher's working load Projects or training pitfalls Students' view and attitudes

toward computer Student's number in classroom Suggestions Thoughts & beliefs Examples and stories Accomplishments Support from Prin

200

Arabic Qal	Arabic Ra	Deen Qal	Deen Ram	E. Qal	E. Ram.
برضو شو التوقعات اللي بحملها المعلمين لاستخدام الحواسيب؟ هل النظرة ايجابية بيحملوها ومقتنعين بأهمية استخدام الحاسوب. كفاح:					

Arabic Qal:

اختلفت النظرة بين اساتذة في سن متقدمة واساتذة اسعاتن حديثى العهد بالتعليم، اما الفكرة الاولى "يا بنتي اتحمليني خليني احكيها بدقة" لاحظنا انه في معلمين درجوا على انا وجدنا آبائنا على امة وانا على آثارهم مقتدون، يعني انه احنا نسير تعلمنا على النظام القديم واصبحنا معلمين، وتعلمنا بالطريقة التقليدية وكذا ميدعين، الان اليه ان يجلس امام الحاسوب، بقول انا الان منذ 20 عام او 25 عام وانا ادرس لا استطيع يا استاذ سلامة اني اقوم بفتح الحاسوب، ولدي اللي بالخامس والسادس بيقوم بعملية الادخال عالحاسوب وطباعة واكسل وبوربوينت وما شابه ذلك، اما انا ابعش هيتي؟ الاجابة فتكون فئتين من الناس، رح تجدي فئة في المدارس

Arabic Ra:

كل فكرة جديدة تُحارب في البداية، يعني على مستوى كان عنا مشروع هان في مديريات التربية وفي فلسطين اسمه الاشراف العام، الاشراف العام معناه انه المدير يكون مشرف على المدرسة اشراف عام من حيث جوانب او محاور فيها التعاون مع المجلس المحلي تفعيل دور التقنيات في المدارس، تنظيم البيئة المدرسية وبناءها من جديد وترميمها ... الخ. الان في البداية عندما بدأت الدورات حُوربت من قبل المديرين السابقين، فأخذوا الدورة الاساسية يعني بدي اقول نسبة 50-60% أصبح كل مدرسة فيها جهاز أو اثنين، LCDعرض فيها عشرات الحواسيب، فيها تجديد في مركز للصيانة في في .... الخ، وبالتالي الامر بصراحة مشجع، الان بعض

Deen Qal:

المشرف:- كل إنسان يحمل نظره للمستقبل،وهم متوقعون أن يدخل الحاسوب للتعليم شاءوا أم أبوا فعندما استدعيناهم لدورة الطباعة فوجدنا لديهم رغبه للتواصل مع الحاسوب،وكثير منهم شارك في دورات للحاسوب فهناك Intelو word link مثل world مشروع تشاركي ل links عن الأعشاب في فلسطين ويستقبل أية تجربة من غزة أو جنين فكل من يعرف عشبه أو لديه معلومات عنها أن يضيفها لهذا الموقع،وهذا الموقع مفتوح للطلبة والمعلمين ولم نجد أية معارضة رغم أن البعض ينظر إلى بعض السلبيات للحاسوب ولكننا نبحث عن الايجابيات في الحاسوب،وكثير من المعلمين يتفهمون للايجابيات في هذا الأمر ونحن علينا أن نوجه طلابنا الأعزاء بشكل ايجابي لاستخدام الحاسوب وننمي الايجابيات؟ المشرف:-لاشك أن كبير السن الذي وصل إلى مرحلة ما قبل التقاعد يعلم أنه لو أراد التعلم

Deen Ram:

نعم الوزارة بتقوم بعقد دورات حتى للمشرفين في مجال التكنولوجيا وكذا،هاي دورات الـ هاي الوزارة اللي SDL عقدتها وأعطونا شهادات على ذلك، هم بيقوموا بمثل هذا الدعم، الان مثل هذه الامور: استخدام الحاسوب، استخدام الانترنت وكذا، ليس بقتصر فقط على اني اعلمك كيفية الاستخدام، انا بدي اعطيك جهاز ، انا بدي ازودك بأجهزة، الان انا اعطيت دورة دون استخدام، هذه الدورة مبتنفعش، يعني انا علمت سائق وقعدت 5 سنين ما بسوق عليها انا نسيت، انا بدي كأني اتدرب من جديد، فالمفروض ان تزود المدارس او حتى المشرف المعني بلاب توب مثلا من الوزارة ولكي يفيد المعلم في مثل هذه المجالات، فهيك لازم انهم ازودونا نحن شخصيا في اجهزة لكل واحد فيما يتعلق بمجال

E. Qal:

بتلاقي هيك وهيك، المعلم اللي عنده مهارة استخدام الحاسوب، مائة بالمائة معندوش مشكلة، وهم في الوقت الحالي في العام 2010/2009 ما زال عدد محدود جدا، يعني في بعض المعلمين في بعض المدارس بستخدم الحاسوب بيحاول يؤثر على غيره، بس مش هالتأثير اذا ما اجا التأثير من مسؤول، ، هناك بعض المعلمين عندهم شخصيا لاب توب وهذا كثير بساعد على استخدامه في الصف، بتوخذ ال LCD ، الموجود في المدرسة وبستخدم اللب توب تبعها، بينما بعض المعلمين بيقول اذا خرب جهاز الحاسوب معي في المدرسة المدير لا يقبلها مني، بتبقى الناحية الاقتصادية بتحكم على طريقة التعامل، بشكل عام التوجه نحو استخدام الحاسوب بس في المرحلة الحالية قليل جدا، يعني بنعدو على الاصابع فقط اللي بيستخدموا ، يعني انا بحب بقوللي المعلم قبل اسبوعين استخدمت الحاسوب وبشهد مديره بذلك، عن انه ما يستخدموش بالمرّه، بقل وبشجعه وبقوله لو مرة علة مرة رح تلاقي حالك انك لازم تستخدم

E. Ram.:

مشرف : هم مندهشين بدهم ياه يعني بدهم بس اول اشي اعطيني جهاز وعلميني حتى بحاولش يتعلم لحاله، ليش اول ا بجوز انه المادة بجوز انه ضغط الشغل بجوز ضغط الحياة يتعرفي ، بس بقولك ا هانا بدي بس ايش انت علميني انت جيبيلي ، فش حدا بتعلم لحاله كفاح : اذا المعلمين كلهم بيحملوا نظرة ايجابية ؟ مشرف : اه ٫ بيقولك يعني اذا عندي باستخدمه في مدرسة بتذكر يعني كانت كثير معارضة للكومبيوتر اخذو دورة المعلمة الي في المدرسة اعطنهم دورة فلاحظت المديرة انه الي معندهاش كومبيوتر او لاب توب راحت تفتش عن واحد مستعمل وتجيبه فسار عندها الدافع يعني صار عندها معرفة انه كاستخدامه في المدرسة بده ايش انو يتدرب عليه انه يكون موجود في المدرسة نفسها ٫ الطلاب نفسهم يكون عندهم حتى يصير هو يفكر

تقول لا استخدم الحاسوب مطلقا وليس ضعفا فيه، انما جاء الحاس	المعلمين امتلكوا هذه المهارة وبعضهم المعلمين لم يمتلك هذه المهارة، لكن الاغلب لحد الان لم ي.	سيستغرق ذلك وقتا طويلا ويكون قد وصل إلى التقاعد لكن الشباب مستعدون.	عمله، وهذا شيء مطلوب، لانه مش كل واحد عنده امكانيات انه يشتري لنفسه من هالمشرفين لاب توب.	الحاسوب، هيك بعفوية، أنا متخيلة انه رح يأتي الوقت اللي يكون استخدام الصبورة شيء نادر ويصير توجه المعلمين لاستخدام الحاسوب	كيف بده يتواصل مع طلابه يعني في استاذ حاول انه , مثلا يستعيض بدل الحصص

Importance of computer How is being used going on\ projects sequences of not having computer Thoughts & beliefs Projects or training pitfalls Challenges stories Facts Accomplishments Support from Supervisors Support from the Ministry Suggestions Ways to encourage teachers/ Teachers' beliefs in computer technology Examples and

APPEDIX I

DETAILED DESCRIPTION OF PEI TRACKS

Overall Objective: Improving the Quality of Learning Environments at Schools		
Specific Objectives: Improve the curricula for selected subjects / grades; update them into modern high quality curricula by developing demanding learning objectives and challenging problems (Develop modern high quality curricula).		
Tracks		Activities
Track 1	Curriculum Development	1. Clarify what curriculum and modern learning theory means (e.g. learner- centered, problem-based learning; curriculum is more than a textbook), develop a concept paper including the state of the art in learning and a framework for curriculum development. 2. Develop a glossary on relevant terms for the work in track 1. 3. Select appropriate subjects and grades (in the workshops, it was recommended to choose Science, Maths, and Arabic and to target all grades). 4. Set up curriculum development teams for the various subjects and grades, considering the involvement of different expertise and experiences. 5. Involve all stakeholders (i.e. curriculum developers, teachers, principals, parents, community, and older students). 6. Define clear, competence-based and measurable learning objectives. 7. Ensure that the curriculum is based on a learner-centered, problem-based learning philosophy. 8. Develop different teaching strategies for the curricula in order to enhance creativity of teaching and assist the teacher (see also specific objective no 3). 9. Consider extra-curricular activities as part of the curriculum (e.g. ICT-projects, sports). 10. Evaluate the curricula periodically. 11. Establish an electronic platform making the curricula easily accessible and thus facilitating the implementation process
Specific Objectives: Align tests and assignments with learning objectives and the standard of international assessment.		
	Tests and Assignments	1. Define national standards for selected subjects and grades based on international assessment standards. 2. Develop standardized tests, also corresponding to the standard of international assessment. 3. Set learning objectives for students and criteria which student will judge work: once students understand what the instructional goals, they will be able to take more responsibility for their own learning. 4. Develop assignments for students with regard to the learning objectives. 5. Develop formative assessment methods in addition to summative assessment: providing the means for detecting students' weaknesses and strengths and for self- evaluation will support students' development throughout the course.
Specific Objective: Develop material for the subjects selected (e.g. lesson plans, media, assignments, guidelines for		

		teachers).
	Development of material	1. Develop student-centered activities, such as motivating tasks for self-regulated learning, group projects, hints for further research, e.g. on the internet or in other resources. 2. Develop instructional material by applying problem-based learning methods. 3. Involve all stakeholders, i.e. students, parents, teachers, and community 4. Integrate various media into the material, e.g. technology-based media, newspaper articles, film material etc. 5. Develop instructional guidelines for the teachers, including lesson plans.
Overall Objective: Upgrading the competences of teachers, principals and educational managers
Specific Objective: Select a group of experienced promoters & institutions competent to train mentor and support 'master trainers'.
	Selection of promoters & institutions	1. Specify the expectations to be met. 2. Set up a selection committee including independent experts in teacher education. 3. Needs assessment: assess the necessary competences of promoters and institutions. 4. Invite potential promoters & institutions to apply for the project. 5. Assess the profiles of the applicants. 6. Decide on which promoters and institutions meet the standards best.
Specific Objective: Develop and implement a coherent and modern training program for the training of 'master trainers'.
	Training program for 'master trainers'	1. Select a group of 15-20 experienced, highly-committed and advanced teachers. 2. Conduct a needs assessment of the 'master trainers'. 3. Develop a modular curriculum for the training of 'master trainers'. 4. Design challenging learning environments for the training of 'master trainers'; let them experience the pedagogical principles they are supposed to apply in their training of teachers (e.g. student-centered learning, ICT-application). 5. Implement the training program by alternating phases of training, coaching and practicing. 6. Evaluate and revise the training program. 7. Certify the successful completion of the program 8. Use an electronic platform to engage a community of practice.
Specific Objective: Design a program for the training of the teachers (e.g. learning objectives, content, material, assessment).
Track 2	Training program for the teachers	1. All teachers involved in the project from the pilot schools are informed about the pedagogical objectives. 2. Conduct a needs assessment of the teachers in the pilot schools. 3. Develop a modular curriculum for the teacher training. 4. Design challenging learning environments for the teacher training and apply modern pedagogical principles (e.g. student-centered learning, ICT-application).

		5. Implement the training program through alternating phases of training, coaching and practicing. 6. Evaluate and revise the training program 7. Certify the successful completion of the program 8. Establish knowledge exchange and the sharing of good practices among teachers (e.g. file-sharing, e-portal, cf. Belgian initiative).
Specific Objective: Develop training for educational managers, principals, policy makers and further stakeholders.
	Training for educational managers and principals	Select a group of 30-40 promoters including the principals of the pilot schools. 1. Conduct a needs assessment of these promoters. 2. Select (and if necessary develop) up-to-date content for the management of change processes at schools. 3. Develop a curriculum for specialized training of educational managers, principals, policy makers and further stakeholders (e.g. university leaders, etc.). 4. Use challenging learning environments for training of educational managers and principals and applying modern pedagogical principles (e.g. problem- based, active learning, ICT-application). 5. Implement the training program by alternating phases of training, coaching and practicing. 6. Evaluate and revise the training program. 7. Certify the successful completion of the program. 8. Establish knowledge exchange and the sharing of good practices among promoters (e.g. file-sharing, e-portal, cf. Belgian initiative).
Overall Objective: Raising the bottom-line in ICT for education literacy and ICT-infrastructure
Specific Objective: Promoting ICT for education literacy for priority groups; build on established initiatives if appropriate; Priority groups are teachers, ICT people principals from the pilot schools, educational managers and policy makers participating in the PEI.
Track 3	ICT for education literacy for priority groups	1. Design a master plan identifying and selecting the different stakeholders of the priority groups, roles and target-groups casted for promoting ICT for education literacy (e.g. teachers of pilot projects, ICT people, educational manager, policy makers, etc.). 2. Conduct needs assessment of the pilot schools (link to Track 2). 3. Conduct survey of existing programs promoting ICT for education literacy (e.g. existing modules at universities, etc.). 4. Analyze gaps, appropriate (modules of) already existing programs; 5. Design program, adapt and/ or adopt existing programs for addressing the different perspectives of the target groups, mainly: - Educate ICT-people, teachers, on how ICT can be used in education with focus on low-cost solutions (e.g., social networking, building and being part of communities in practice, searching, finding and using relevant content, educational tools),- ICT people on how ICT can

		be used in education for the design and offering of ICT solutions,- Policy makers and relevant stakeholders (e.g. university leaders) for specialized training on ICT for Education. 6. Produce the training action plan (in coordination with track 2), the development plan (joint pilot implementations) and funding needs. 7. Implement the training action plan, conduct the training, monitor progress; formatively evaluate the training process. 8. Implement the development plan: Bringing together trained education people and ICT people in pilot developments; jointly conceptualize and design learning solutions (link to track 1); 9. Engage external evaluators for feedback on training and for impact evaluation at the end of the pilot stage. 10. Evaluate the impact at the end of the pilot stage. 11. Produce a revised training program according to the evaluation results. 12. Provide recommendations to institutionalized program and dissemination
Specific Objective: Providing and maintaining ICT-infrastructure according to appropriate models (e.g. "computer on wheels" model at pilot schools, ICT infrastructure at community centers, providing teachers and families with laptops).
	ICT-infrastructure at pilot schools	1. Conduct a needs assessment of hardware, software, security, connectivity, etc. of the pilot schools and the community centers available to the schools. 2. Elaborate on the requirements for much-needed ICT-infrastructure at pilot schools (in coordination with Track 1: learning environments); this step should be conducted in collaboration of education and ICT people. 3. Design concepts of flexible use of ICT (e.g. 'computer on wheels', ICT infrastructure at community centers, providing teachers and families with laptops) to allow the largest number possible to make use of the equipment. 4. Conduct procurement in order to get sufficient tenders providing ICT infrastructure. 5. Design a master plan for the equipment of the pilot schools or other learning locations (e.g. community centers) and deploy the needed ICT infrastructure. 6. Design a maintenance strategy for the ICT in operation and deploy management and maintenance needs. 7. Ensure the usability of ICT and allow for privileged access on ICT for teachers in phases of advancing their ICT-based education competences. 8. Monitor the process and evaluate the results. 9. Provide recommendations on dissemination policy, procedures and point of references at pilot schools (e.g. ticketing system), lessons learned, and feedback on experiences to be considered for the roll-out.
Specific Objective: Provide low-cost, easy-to-use and sustainable systems, software tools, platforms to mobilize the ICT

Infrastructure. Definition: - Systems = packages for communication and information technologies, e.g. video streaming, or standards such as SCORM- Software Tools = Flash, Adobe, etc., for uploading files, creating material - Platforms = Moodle, Learning Management System		
	ICT-systems, tools, plat-forms at pilot schools	1. Elaborate requirements of needed ICT software at pilot schools (in coordination with Track 1: learning environments); this step should be conducted in collaboration with education and ICT people. 2. Conduct a survey of available software systems, tools, platform and international security standards. Clear focus should be on low-cost, easy-to- use and sustainable solutions that can be scaled within the local context. 3. Conduct a needs assessment of systems, tools, platforms, etc at the different pilot schools respectively learning locations (e.g. community centers). 4. Run international expert workshop to review findings of needs assessment. 5. Based on the recommendations of the expert workshop, design an IT strategy, e.g. platform strategy, open source or not, etc. 6. Conduct procurement in order to get sufficient tenders providing ICT software (if not purely open source). 7. Customize the platform (such as Moodle) if necessary, according to the results of the expert workshop and keeping in mind the low-cost approach 8. Deploy systems and tender customized solutions. 9. Deploy management and maintenance needs. 10. Train the technical personnel for the administration process of the selected software systems, tools and platforms at the pilot schools. 11. Ensure usage of software systems, tools and platforms and allow for privileged access on ICT for teachers in phases of advancing their ICT-based education competences. 12. Secure sustainability of software systems, tools and platforms. 13. Monitor the process and evaluate the results. 14. Provide recommendations on the policy for dissemination, procedures and point of references at pilot schools (e.g. ticketing system), lessons learned, and feedback on experiences to be considered for the roll-out.

EXAMPLE OF TEACHER NARRATIVE MEMO

Math Teacher/ Qalqilia Use

- Ms. Aya has 17 years teaching experience: two years in Jordan and 15 in this school. Ms. Aya teaches 12th grade Math. She is also vice principal for the same school.

- Ms. Aya mostly uses computer in teaching by using Power Point, Word and Excel. She focuses a lot on Power Point because she uses colors, movement and sounds and that attract students. Last year she used the Internet and email connection with students.

- She does not ask students to design PowerPoint for her lessons like some teachers do, and that is due to the kind of subject that she is teaching. According to Ms. Aya, Math is different from the other subjects because it requires her to focus on certain issues more than the other and students can't do that

- Ms. Aya decided to use computer in her work because it saves time especially in doing yearly lesson plans. Every year, she just changes dates and makes small corrections.

- Computer technology also saves time in teaching, instead of writing on the board, things are already written on PowerPoint slides and the teacher just presents them. According to her, she uses the saved time to interact more with the students. Instead of turning her back to students writing on the board, she communicates more with students. The teacher also is able to explain things that is very hard to do

- She observed changes in her students when she started using the computer in the classroom; students became more active. When she did not use computers, students were sleepy or busy talking with their friends.

- Keeping pace with the development is another reason that made her integrate computer in teaching. By using the Internet and she can access examples or Math Power Point Presentations, from other Arab countries.

- The teacher took a training workshop which was organized by the British Council. The workshop was about train teachers how to design attractive lessons using sounds and colors and how to present them. During that workshop, the organizer of the training gave each teacher a laptop and LCD to use them in their schools. The teacher was using the laptop and LCD in the classrooms until the laptop got broken last year.

- Ms. Aya learned to use the computer through participating in training courses that were organized by education directorate office, some of these training were about Word, Excel, Photoshop, The Internet, and PowerPoint (ICT project). Besides all of that her husband encouraged and supported her a lot. She spends hours at home

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