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The American University in Cairo

FACTORS AFFECTING ELEMENTARY TEACHERS' DECISION TO INTEGRATE
INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) IN AN EGYPTIAN
INTERNATIONAL SCHOOL

A Thesis Submitted to

Graduate School of Education

in partial fulfilment of the requirements for

the degree of Master of Arts in International and Comparative Education

Pre-K – 12 Teaching and Learning Major

By

Shaimaa Mohamed Hafez

Supervised by

Dr. Gihan Osman and Dr. Ted Purinton

May 2013

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Abstract

Integrating Information and Communication Technology (ICT) is a desired educational outcome. Schools invest substantially in technological hardware and software as well as teacher training to encourage ICT integration. However, the results often do not match the investment. The current case study examined the factors that affect elementary teachers' decision, in an Egyptian international school, to integrate ICT in education with the aim of using the results to inform future ICT related decisions, policies and practices at this particular school. Using a modified form of participatory evaluation (Cousins & Whitmore, 1998; Zukoski & Luluquisen, 2002) and Wagner's and Kegan's 4 C's model (Wagner et al., 2010), the researcher used quantitative and qualitative methods to investigate the conditions, context, competencies, and culture that impact ICT integration at the individual and organizational levels. An online survey was administered to all elementary teachers at school X to examine the current status of the school in terms of the 4Cs. This was followed by a focus group for which low-ICT and high-ICT integration teachers were selected to discuss 1) the current state of the school for ICT integration in terms of the 4Cs; 2) the desired state of the school; and 3) recommendations that would enable the school to bridge the gap between both states. It was expected that the participatory nature of the research would enhance teachers' ownership of the ICT integration process and outcome. One of the main conclusions in this study is that almost all elementary teachers in school X believe in the importance of ICT integration in the teaching and learning process. Deficiencies in their ICT integration trends are not due to teachers' perception, rather they are caused by one or more of the factors identified in the four domains, culture, conditions, competencies, and culture such as lack of adequate instructional/pedagogical support or the low quality of some of the professional development sessions that teachers attend. The outcome of this research was a set of recommendations for a realistic, clear, and achievable action plan to enhance the

effectiveness of ICT integration in school X. Factors identified to affect elementary teachers' decision to integrate ICT in education included but were not limited to: training in ICT integration, technical support, pedagogical support, access to technology resources, teachers' competence in using multiple ICT tools and skills.

Keywords: ICT integration, institutional level factors, individual level factors, culture, conditions, competencies, context, teachers, school

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Chapter One - Introduction

"If we teach today as we taught yesterday, we rob our children of tomorrow."

(John Dewey, as cited in Turkmen, 2006, p. 71)

Being a 20th Century learner and a 21st Century teacher, Dewey's quote had always been inspirational for me from the beginning of my career path. According to Ertmer, Addison, Lane, Ross, & Woods (1999) to teach the 21st Century learners and give them the necessary skills to become ready for future employability in tomorrow's labour market, teachers should not teach their students today the same way they had been taught or the same way they had been traditionally teaching (Watson, 2001). When I was in high school, we used to enter the science class, sit in our assigned seats and spend the whole 45 minutes in the classroom copying silently from the blackboard. Learning was never expected to take place outside of the class boundaries and a lot of times not even within the class boundaries. Now technology has changed education enormously; even the teacher that is still teaching using the most traditional teaching methods is at least downloading worksheets from the Internet to use with her students.

Lately integration of Information and Communication Technologies (ICT) into education had been paid greater attention on all levels worldwide where it became an essential part of countries' politics. Policy makers globally have been following the adoption of ICT in education and have been ensuring enough funds are allocated, and that standards are set and met to guarantee better education for youth. According to David Blunkett, UK Minister for Education and Employment, "The use of digital technology for improving the delivery of education has enormous potential to raise standards and increase employability" (as cited in Watson, 2001, P. 252).

There are a number of global movements that are emphasizing the vital role ICT integration has on education. The UNESCO (2011), for instance, encourages integrating ICT

in education as part of Education for All (EFA) movement; they believe that technology can “contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers’ professional development and more efficient education management, governance and administration” (ICT in Education, para. 1). ICT integration does not fancifully mean that students’ academic achievement will be higher upon its diffusion and adoption into the educational process, but with no doubt it will increase students’ motivation, allow differentiated instruction, and engage students through varied interactive teaching tools.

Likewise, integration of ICT into education is not just about bringing some new devices into the classroom, downloading worksheets from the Internet for the students, or even using the interactive whiteboard as an LCD projector (or as referred to in Egypt as data show) to display a picture of the water cycle. The decision to integrate ICT will only be effective if it will facilitate and support the learning process, help students reach learning outcomes, and motivate them to create, communicate, and collaborate in ways that had never been possible before. One of the merits of ICT integration in education is taking learning outside of the class boundaries and opening the door for students to learn, unlearn and relearn each at his own pace, which will never be realized if the integration is neither meaningful nor supporting or supported by the teachers’ teaching pedagogy (Dyrli Kinnaman, 1994).

The success of any educational change, like ICT integration, mainly depends on the teacher as they are responsible for deciding the medium and the tools through which the educational materials are passed on to students (Watson, 2001). Through my ten years of giving ICT professional development training sessions for teachers, and the feedback I get from them, I realized that teachers’ decision to integrate ICT into education depends upon multiple variables including the level of their awareness of its influence on students’ learning, openness to stay up to date and accept change, confidence in their capabilities and

competence. It also depends upon the level of support given to them by the educational institution's administration through providing sufficient technological resources and technical support.

ICT integration in education can revolutionize the educational process of students (Kozma & Anderson, 2002). It is the 21st Century learners' language, so I continuously exert all the efforts to assist teachers through the ICT integration process and try to facilitate most difficulties they face. To maximize the efficiency of ICT integration in the school under study; referred to as "School X" in the remainder of the research to guarantee the anonymity of the school, and to provide better assistance to teachers, it is important to thoroughly study the factors that motivate or discourage teachers to use ICT to deliver instruction.

1.1 Problem Statement

Factors affecting integrating ICT in education have been commonly classified as institutional level (like infrastructure and training) or the individual level (like teachers' perceptions and ICT capabilities) factors.

School X is providing the latest available technology like having an up-to-date School Management System, a library management system, a highly interactive web portal, interactive whiteboards, five ICT labs, access to a software server that includes cutting-edge computer applications and various licensed electronic educational resources. Also school X often offers ICT training sessions and workshops for teachers during the school in-service days. Yet, technology resources are "Oversold and Underused" (Kotrlik & Redmann, 2009); where most elementary teachers are still not fully integrating ICT in education (Becker, Ravitz, & Wong, 1999; Becta, 2003; Corte, 1990; Pelgrum, 2001). Therefore, it is important to study the factors that motivate or discourage teachers in order to be able to design a plan of action that will help them enhance ICT integration in their classrooms.

1.2 Purpose of the Research

This research examines the factors that affect elementary teachers' decision, in an Egyptian international school, to integrate Information and Communication Technologies (ICT) in education. The expected outcome of this research was a set of recommendations for a realistic, clear, and achievable action plan to enhance the effectiveness of ICT integration in school X. After studying the factors that motivate and hinder teachers from using technology, action steps have been developed to encourage the motivators agreed on by teachers and to reduce the barriers and obstacles hindering them from efficient ICT integration.

Chapter Two –Literature Review

2.1 Importance of Integrating ICT in Education

Technology became a vital component of everyday activities worldwide, where most industries are now digitalized and the majority of people find it almost impossible to survive without ICT as it helps them stay connected to their families and businesses, as well as providing them with professional development opportunities (Buabeng-Andoh, 2012; Ertmer et al., 1999; Melita, 2005; Mikre, 2012). In Egypt, as a developing country, there is an increased awareness of the importance of digitalizing all the country's systems and various industries to catch-up with the world's fast rhythm and to revive its economy. Any country's reform plans should start with the educational system since it helps shape that youth's mentality - the future policy makers and business owners. Educational institutions should integrate ICT into all the curricula to provide the 21st Century learners with the required skills and knowledge to compete in the global market (Bingimlas, 2009).

Net generation students use technology fluently and naturally. They come to the class today expecting the teacher to speak their own language; even the 5 years old student can easily run a discussion about their iPads, smartphones and Facebook accounts. Most of these students spend hours daily interacting with technology, but unfortunately this time is often wasted based in terms of lost educational opportunities that those ICT tools could have facilitated if they were well guided.

To ensure quality education, teaching in most educational institutions is shifting from the traditional approach to the constructive approach (Mikre, 2012). Traditionally the teacher used to have full control over the whole learning process, where the transmission of knowledge was a one way communication; teacher talking time always dominated the class, activities decided by the teacher were very limited with little variation, students worked in an

individual manner (lack of teamwork) and did not have a chance to apply what they learnt, and students' different learning styles were neglected (Voogt, 2003).

According to Melita (2005) the learning process currently is becoming more collaborative in which the teacher is acting as the facilitator and the students have a range of activities to choose from to construct their own knowledge (Volman & Van Eck, 2001). Mikre (2012) argues that integrating ICT in education facilitates constructive learning as it opens opportunities for students to learn at their own pace, in the way that best suits them, and makes the learning process more engaging. Through ICT, students enhance their communication skills, where they get to work in teams that are sometimes in different countries, and support each other's learning. Once ICT integration is viewed as an add-on to the teaching load and will be used just to support the traditional lecturing philosophy then it should never be used because it will just be a waste of valuable teaching time (Mikre, 2012).

ICT should be used as an instrument to enhance education development plans (Voogt, 2003). It is a key factor in making education a real life practice where students get a chance to experience all what they learn in a hands-on way. ICT integration could shift education from a boring process into a challenging experience that would make students eager to wake up every morning, go to school and start a very interesting journey of exploring, understanding, developing new skills, researching and working in teams (Afshari, Bakar, Luan, Samah, & Fooi, 2009).

Integrating ICT in education allows students to view the world from a different perspective rather than limiting their vision to their teachers' knowledge and beliefs; it opens the door for them to interact, analyze, compare, criticize and develop their own knowledge.

According to Volman (2005) ICT integration is not just learning about and using computers in the classroom rather; it is learning through computers; it is mingling various technological tools to revamp the educational processes. However, the mere fact of having

computers, interactive whiteboards, and the entire latest technological infrastructure in the classroom does not mean that ICT is being integrated in the learning process. Rather ICT should be used to help students not only access information but also become able to analyze, make connections, assess and present the information to build knowledge and get more involved in the learning process (Antifaiff, 2000).

Besides supporting students' learning, ICT is also important for teachers' professional development, where it gives them opportunities to connect to teachers' social networks and podcasts from all around the world. Through those connections teachers get new ideas, instructional techniques, and projects that they can integrate in their teaching. They also bring to the classroom chances for their students to work on collaborative projects with others classes from different cultures, which prepare the students for the real world.

2.2 ICT between Planning and Implementation

It is often noticed that within the same school only a few teachers make the effort to integrate ICT while the rest do not, although the same technological equipment is available in all classrooms. Undoubtedly, one of the main reasons behind that is the absence of a clear school wide ICT policy that comprises the school vision, objectives, needs, short and long term goals, and/or takes into consideration teachers' capabilities and work load (Levine, 1998).

As Volman (2005) stated, in the past few years schools worldwide have invested a considerable amount of their budgets on the latest technological infrastructure in an effort to integrate ICT into education, but as discussed earlier, this did not yield the magical results that school administration anticipated. Before expecting teachers to integrate ICT, the school vision and plan to achieve that should be shared with the teachers who should be given enough curricular and technical support to help them achieve this goal (Antifaiff, 2000). The

more the plan is attainable and representative, the easier and more effective ICT integration will be (Levine, 1998).

Since the main goal of ICT integration is to enhance instruction to attain the learning objectives, it should begin in the curriculum rather than the classroom. School leaders and administrators need to provide teachers with curricular support training sessions, demonstrating how to make meaningful integration of ICT into the curriculum, in addition to technical training sessions that do not just show teachers how to use the technological tool but also emphasize on its practical usage in the classroom (Ertmer & Ottenbreit-Leftwich, 2010). Teachers need to understand that their teaching pedagogy should come before technology choice. They need to be clear on the learning objectives that should be delivered to the students, the affordances of the available ICT tools and then decide on the tool that will best achieve those objectives (Watson, 2001).

While training is a highly important factor to ICT adoption, its success depends also upon the feedback provided by the teachers after the training (Afshari et al., 2009). It is good to have a planned and structured training, yet it needs to take into consideration that teachers need some time to adopt the idea, implement it, evaluate it, then find a channel to voice their comforts and concerns. This feedback should be used by the trainers to tailor their training sessions.

2.3 Teachers and Change

Teachers are a key factor in integrating ICT in education together with the availability of technological infrastructure and tools (hardware and software). There are several factors that affect teachers' acceptance to shift from the traditional ways of transferring knowledge to students, to a learner-centred approach. Some of these factors are age, gender, years of experience (Afshari et al., 2009). Butler & Sellbom (2002) added to them awareness, beliefs and attitude, work-load, scheduling, reliability and training.

Borko and Putnam (1995) argued that the way teachers teach, is affected by their thinking, which is shaped by their knowledge. As a result, to study the teacher's teaching pedagogy we need to first examine what they know, and the way they think, judge, and take decisions, then study how their knowledge and thinking shapes the way they teach. Likewise, if we want teachers to change an aspect of their teaching pedagogy, we need to let them know more about the area where change is needed.

To learn more about the stages through which teachers choose either to accept or reject adopting a technological tool into instruction, it is important to look into Rogers' (1995) theory of "diffusion of innovation". Rogers proposed that the adoption process occurs in five stages, which starts with knowledge. Lee Shulman (1986; 1987) twenty years ago, defined teacher's knowledge to be about the subject, teaching techniques, classroom management, learners, contexts, and goals and believes determined teacher's success, with no reference to technology (as cited in Ertmer & Ottenbreit-Leftwich, 2010). In the 21st Century, the same ideology is not realistic as ICT is a vital component of effective teaching as discussed earlier, therefore it is indispensable that educational institutions would make all the efforts to increase teachers' awareness of the importance of ICT integration in education and provide the sufficient on-going training to support the implementation.

The second stage Rogers (1995) identified is Persuasion. Upon knowing about a specific technological tool, teachers build either a negative or positive attitude towards it. According to Mikre (2012) teachers might find it difficult to realise the significance of the tool to the learning process, so it is important while planning the teachers' training sessions to show them practical uses of the tool. Preferably, training should be in their own content area to get them to believe in its importance, build a positive attitude towards it, and feel encouraged to integrate it in their instruction.

The third stage is Decision. In this stage based on the knowledge and attitudes teachers have formed about the technological tool, they decide whether the integration of the tool will add up positively to the learning process through enhancing teacher's instruction and students' learning, or negatively through just adding to their teaching work load with no added value to the learning process. Upon settling on a judgment towards the technology tool, teachers decide either to adopt or reject it.

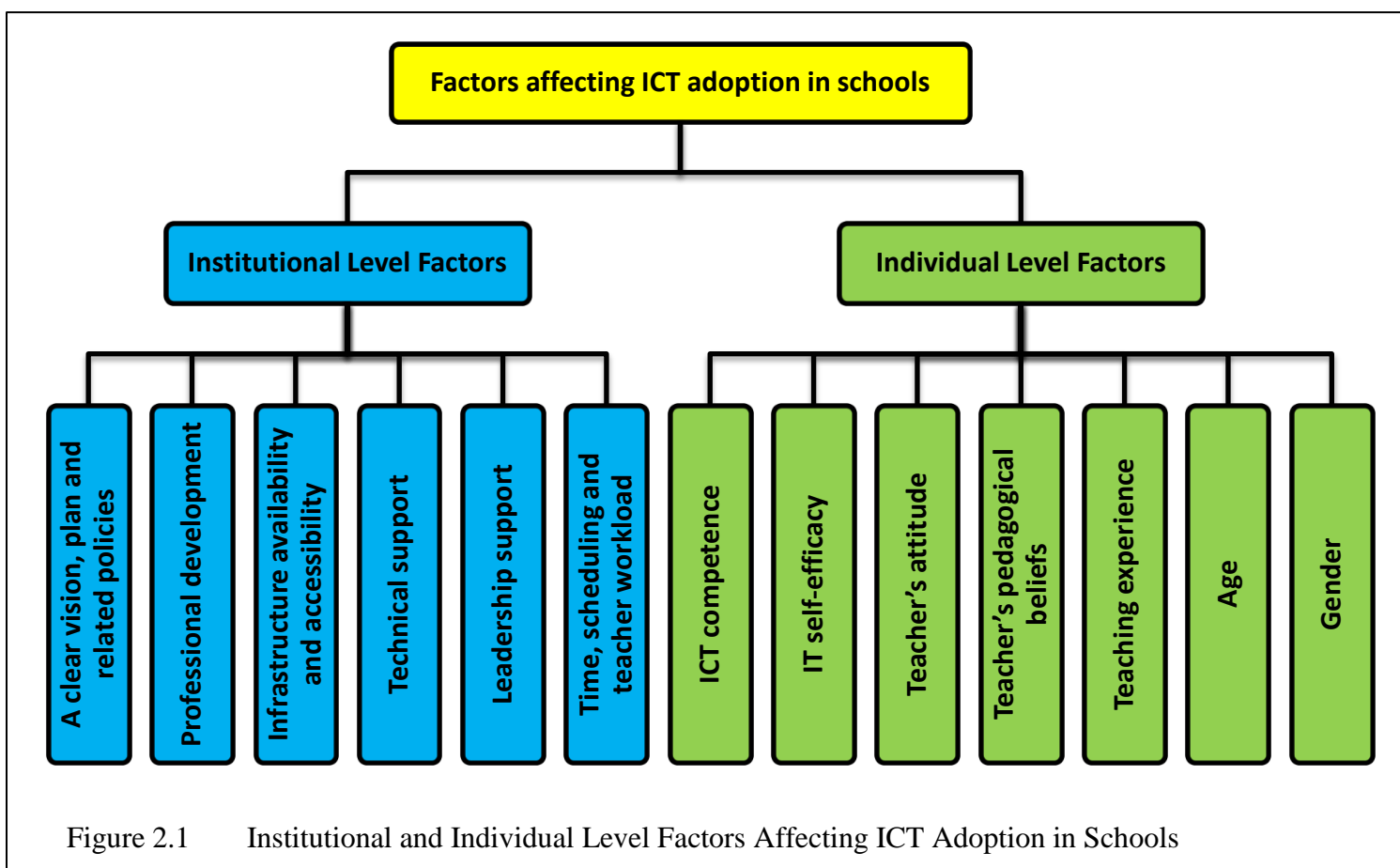
Implementation comes in the fourth stage. Teachers should still be offered training while using the technological tool, as they will need both technical support to know how to solve any technical glitches while using the tool and curricular support to get assistance in the teaching and learning difficulties they face during implementation (Tong & Trinidad, 2005).

The last step is Confirmation. At this step, teachers get to evaluate the success or failure of using the ICT tool which determines whether teachers will continue using it in the future or not. It is very important that school leaders and administrators would design an instrument to collect feedback from teachers and use it for future integration projects.

Rogers's diffusion model in my opinion should be a road map for educational institutions when planning for any change that would affect the teachers' pedagogical practices, even if this change is not related to technology, as it gives the teachers support in every stage of the adoption and implementation process. Rogers's model will be used in this research to ensure that the action plan developed will take into consideration support for teachers in every step in the change process starting from raising teachers' awareness about a specific technological tool (knowledge stage) until collecting feedback from teachers after they evaluate the success or failure of using the ICT tool (confirmation stage) in the classroom.

2.4 Factors Affecting ICT Integration

There are several factors affecting ICT integration in education. Literature divided them into two types; one related to the organizations and the other related to the individuals using the technology (see Figure 2.1). To refer to these two types, studies used different terminologies; extrinsic and intrinsic (Ertmer, 1999), external and internal, manipulative and non-manipulative (Afshari et al., 2009), teacher-level and school-level (Becta, 2004), material and non-material (Pelgrum, 2001). The following section will present in depth these various factors in an effort to study which of them affect teachers' decision to integrate ICT in the school under study and come up with an action plan that would be implemented to improve effective ICT integration.



2.4.a Institutional level factors. Those factors are not controlled by the teachers, but they affect the teachers' integration decisions; their availability helps teachers in building positive attitudes towards technology integration and vice versa.

2.4.a.i A clear vision, plan and related policies. The institution's vision of the goals and benefits of integrating ICT in education for both the teaching and learning process has to be very clear before the actual purchase of the IT resources (Bennett, 1996; Means & Olson, 1997). Strudler & Wetzel (1999) argued that the institution should then have a detailed plan and related policies that guide the steps, stages, and methods of ICT integration for teachers. Having a clear vision and plan increases the level of teachers' acceptance and implementation of the integration process (Sang, Valcke, Van Braak, & Tondeur, 2009).

2.4.a.ii Professional development. As previously mentioned in section 2.3, training is crucial for supporting teachers through any change process. To ensure efficient ICT integration, teachers must be provided with sufficient on-going training (Vannatta & Fordham, 2004). Similarly Mueller, Wood, Willoughby, Ross, and Specht (2008) proved in a research study of 400 pre-tertiary teachers that the degree of effectiveness of ICT integration highly depends on professional development. Training sessions should be about how to integrate ICT into teaching; research found that the majority of training sessions are about the technology itself rather than the ways to use it in the classroom (Schaffer & Richardson, 2004). Likewise, training sessions should be targeting teachers' varying competency levels (i.e., beginner, intermediate and advanced) to allow teachers with different ICT skills to increase their competence level in using the technology (Becta, 2004). The trainer should start with basic ICT knowledge then gradually move up with the teachers' skills to help them master integrating the new technology (Schoepp, 2005).

When planning these training sessions, it is essential to devote a time block where teachers get a chance to apply what they are trained for then share their feedback with the attendees and the trainer to reach a real understanding of the process and hence ensure higher integration success rate (Rosenthal, 1999). It is also very important that the institution would make extra training available for teachers who need it (Jones, 2004). Buabeng-Andoh (2012) argued that proper training works on dissolving the psychological barrier between teachers and ICT integration; it clearly focuses on showing teachers its benefits to both teaching and learning (Plair, 2008). It also simplifies and guides teachers to steps and methods of ICT integration and increases teachers' skills in using the technology in their teaching (Bauer & Kenton, 2005; Franklin, 2007).

2.4.a.iii Infrastructure availability and accessibility. Institutions adopting ICT integration need to have sufficient budgets for ICT resources to be able to purchase sufficient up-to-date hardware and software (Goktas, Yildirim, & Yildirim, 2009; Gülbahar, 2005). Resources availability should not be limited to computer labs and grade level centers; rather it should spread in the institution to facilitate access to technology to support ICT integration (Buabeng-Andoh, 2012). It is noticed that teachers with sufficient computers in their classrooms use them more in their teaching than teachers with less computers (Becker, 2001). When Pelgrum (2001) studied top ten factors affecting ICT integration, he found out that four of them were connected to accessibility; "These barriers were insufficient numbers of computers, insufficient peripherals, insufficient numbers of copies of software, and insufficient simultaneous Internet access" (Bingimlas, 2009, p. 240).

One of the challenges faced in Egypt is scarcity of educational resources for Arabic studies. Teachers find it very difficult to find resources online for the subjects they teach; where sharing resources is unfortunately not part of the culture. When planning training

sessions for Arabic studies' teachers will often use resources created by teachers in the Gulf area when it is not possible to locate online resources created by Egyptian teachers.

2.4.a.iv Technical support. Efficient technical support is a major factor affecting ICT integration as it increases system reliability which in turn increases ICT integration (Butler & Sellbom, 2002). According to Bingimlas (2009) technical problems act as a major obstacle in the way of ICT integration; if teachers are not confident that whenever they face a hardware, software or infrastructure problem somebody will quickly be available to fix it without wasting the class or teacher time, they will tend to refrain from using the technology in the targeted manner (Buabeng-Andoh, 2012). Sufficient technical support also ensures proper technical maintenance which in turn decreases system failure and increases stability (Becta, 2004). As concluded from many research studies, technical support is as important as technology acquisition; without it teachers will not be willing to integrate ICT in their classes (Tong & Trinidad, 2005; Yilmaz, 2011).

2.4.a.v Leadership support. Leadership support is basically providing teachers with a leader who is responsible for the whole school ICT integration plan. Leadership support can be achieved through a qualified coordinator who supports, facilitates and speeds-up the integration process in the educational institution as a whole (Jones, 2004). This coordinator should be hired solely to do an analytical job; where he/she should be analysing the school technology integration situation, putting plans of action, and monitoring the implementation process to support teachers and to further develop the integration process (Tondeur, Van Keer, Van Braak, & Valcke, 2008). This can be achieved through testing teachers' training needs and tailoring the training sessions accordingly, identifying integration problems faced by teachers and finding solutions for them, encouraging teachers to use the technology when planning their lessons as well as implementing plans to enforce using ICT on a daily basis

like communicating through emails, using a school management system for publishing students' grades, etc. (Yee, 2000).

2.4.a.vi Time, scheduling and teacher workload. According to Mumtaz (2000) there is no doubt that ICT integration into education requires some extra time. Time is needed to integrate the new technologies into the curriculum, add various digital activities to the learning process, dig through Internet websites, and time for extra research and discussion to make sure students get the best learning outcomes from this integration (Bingimlas, 2009). Availability of this time depends on scheduling and teacher workload; schedules with long blocks give the students a better chance to use technology in their learning than schedules with short blocks (Becker, 2001). Likewise, Bingimlas (2009) argues that teachers with heavy workloads lack the time to meet with colleagues and work as a team on interesting relevant activities. Likewise one of the 26 computer coordinators involved in a study conducted at high schools in Sydney affirmed that teachers' workload can threaten ICT integration efforts by teachers stating that: "Asking them to take on board yet another task in an already overcrowded curriculum and extremely busy work day is pushing many teachers to the limit and in some cases beyond" (Neyland, 2011, p. 162).

2.4.b Individual level factors. Building a strong IT infrastructure in a school is not a guarantee that ICT will be integrated in the educational process; it is the teachers' readiness to use and integrate ICT that ultimately determines its effective adoption (Jones, 2001). Therefore, it is very important to study the individual level factors. Individual level factors are very personal and are based on attitudes and perceptions, because they are related to persons unlike the institution level factors that are more related to organizations. Different research studies had contradicting outcomes (Buabeng-Andoh, 2012). For instance, some studies concluded in their research that the more experienced teachers tend to integrate

technology more than novice teachers as they are confident enough in their teaching pedagogy and have enough time to integrate ICT (Lau & Sim, 2008). Other studies concluded that novice teachers would be more into ICT integration as they would be more experienced in using computers, and most probably have received more training in using ICT (Smerdon et al., 2000).

2.4.b.i IT self-efficacy. Teacher self-efficacy is the level of confidence teachers have to use the technology and integrate it in the teaching and learning process. The higher the teacher's confidence in his/her success, capabilities and control, the better the teacher is able of integrating ICT in education (Peralta & Costa, 2007). According to Becta (2004) confidence is perceived as the most important factor in ICT adoption, it is "more important than skills and knowledge" (Ertmer & Ottenbreit-Leftwich, 2010). Teachers with ICT knowledge and lack of confidence are not able to integrate ICT due to their "fear of failure" (Beggs, 2000). Jones (2004) stated that due to the importance of this factor, the educational institution should make the effort to increase teachers' confidence by increasing their ICT skills through extensive training sessions for teachers so that they feel that they have higher control over the technology and hence feel more comfortable using it. Another method to increase self-efficacy is to give teachers enough time – before using the technology in class – to experiment the technology with a space for trial and error (Somekh, 2008).

2.4.b.ii ICT competence. ICT competence is having the sufficient knowledge and skills to handle multiple ICT applications. Teachers who are not proficient in using technology have less confidence adopting change and integrating ICT in education (Becker, 2001). As previously discussed, lack of confidence is a great obstacle to ICT integration in education. Therefore, sufficient training and tailored professional development is required to strengthen teachers' ICT skills and increase their knowledge, which will eventually increase

their confidence to use ICT in the classroom without fearing that their students might be more competent than them in using technology (Jones, 2004). Studies also show that teachers with high ICT competence are better motivated to integrate ICT in education and hence give their students a better chance to be more exposed to using computers in the classroom (Sang et al., 2009).

2.4.b.iii Teacher's attitude. There is a strong correlation between teachers' attitude and ICT integration in education; teachers with positive computer attitudes are more likely to use technology in their teaching process (Van Braak, Tondeur, & Valcke, 2004). This positive attitude supports innovation and helps the institution digitalize the learning process at a faster rate (Woodrow, 1992). Even with less ICT infrastructure, teachers can effectively integrate ICT in teaching if they have positive attitudes towards technology (Demirci, 2009). Teachers' positive attitude can be caused by teachers' competence in using the technology, their ICT experience, their clear knowledge of how much the integration will have a positive influence on both teaching and learning processes, and a supportive integration environment through leadership, colleagues and technical support (Becta, 2004; Rozell & Gardner, 1999; Schoepp, 2005). On the other hand, teachers can have negative attitudes towards ICT integration due to bad previous experience with ICT either on a personal level or vicariously through a colleague, or due to lack of time and training to understand the importance and benefits of ICT integration.

2.4.b.iv Teacher's pedagogical beliefs. Teachers' beliefs about the importance of ICT integration in education play a big role in their willingness and acceptance to engage in the integration process. Judson (2006) debated that teachers with traditional teaching beliefs tend not to integrate ICT while teachers with constructive teaching beliefs tend more to integrating ICT in education (as cited in Ertmer & Ottenbreit-Leftwich, 2010). Teachers' pedagogical

beliefs develop with the increased use of technology in education (Ertmer & Ottenbreit-Leftwich, 2010). When teachers see the great effect integration has on the students' learning, it alters their beliefs and makes them more open to the integration process (Sandholtz & Ringstaff, 1996). When a new technology is introduced, teachers begin getting sceptical about whether it will benefit the teaching and learning process. This is one of the reasons why training is very crucial. To help teachers alter their pedagogical belief towards this new technology, the training sessions should clearly show how this new technology will help enhance the education in the same subject the teacher teaches to dissolve the opposition of their pedagogical beliefs towards it (Hughes, 2005). Although institutions exert a lot of efforts to alter teachers' pedagogical beliefs, teachers who go through the integration are the ones who already believe in it (Higgins & Moseley, 2001).

2.4.b.v Teaching experience. Effective ICT integration in education is a new aspect for teachers. Some studies showed that technology integration is inversely related to teachers' teaching experience. Less experienced teachers tend to use ICT more extensively in the classroom (Baek, Jong, & Kim, 2008). This is due to the fact that fresh graduate teachers have more expertise in using the technology on a personal and professional level (Buabeng-Andoh, 2012).

On the other hand, some studies show that more experienced teachers have higher levels of ICT integration; their teaching expertise and classroom management provide the teacher with more time for technology use in the classroom (Lau & Sim, 2008). While fresh graduates consume much of their time in their first years of teaching accommodating with the system and have very little time to work on integration (Russell, Bebell, O'Dwyer, & O'Connor, 2003). Further researches found no significant relationship between ICT use and

teaching experience, which makes this factor a weaker factor affecting ICT integration (Buabeng-Andoh, 2012).

2.4.b.vi Age. Some literature concluded that integrating ICT in education decreased with the increase of age; older teachers got their education at a time when computers were a new invention that they had to learn about (Waugh, 2004). On the other hand Albrini's (2006) research suggests that a teacher's age is not an important factor in determining teachers' attitudes towards ICT integration in education.

2.4.b.vii Gender. Early researches showed that female teachers' use of ICT in education is less than male teachers; this is due to the lack of appropriate skills, availability of technology, and interest in ICT (Volman & Van Eck, 2001). Male teachers have more interest in technology (Becker, 2000). However, other research studies have suggested that female teachers use ICT more than male teachers (Adams, 2002; Beisser, 2006). Yukselturk and Bulut (2009) reported on a number of studies which argued that the gender gap has diminished recently. Other studies found that gender does not affect teachers' use of ICT in education (Kotrlik, Redmann, Harrison, & Handley, 2000).

2.4.c The 4 C's "arenas of change" model. Wagner and Kegan (Wagner et al., 2010) proposed a model to carry on transformations in schools. This model emphasizes the importance of the connection between the organizational and individual level factors (discussed earlier in sections 2.4.a and 2.4.b) and how these factors should be used as a base for the school community to evaluate the school current and targeted state regarding particular issues as well as create the action plan to close the gap between both states. Figure 2.2 shows how each of the institutional and individual level factors tie to the 4 C's "arenas of change" model. This model will be used to examine and work on enhancing ICT integration in the school under study through ensuring the involvement of teachers as the

main stakeholders in the technology integration process. Teachers' involvement is expected to enhance their ownership of the ICT integration projects and would consequently encourage them to act as catalysts of the change process. The four arenas of change identified by Wagner and Kegan are: culture, conditions, competencies, and contexts.

2.4.c.i Culture. Culture is the shared values, beliefs, expectations and behaviours between all the school stakeholders; it is the way things really happen (Wagner et al., 2010). Some indicators of culture are the level of teachers' involvement in setting school goals, the degree to which teachers' voice is heard, and the extent of parental involvement in their children's education. Thus, teachers' involvement in the school vision, plan and related Policies (section 2.4.a.i), and teachers' continuous engagement in professional development (section 2.4.a.iii) are both institutional level factors that would fall under Culture.

2.4.c.ii Conditions. Conditions are all the material factors that affect student learning; it is the way the school time, space, and resources are organised to shape the current school state (Wagner et al., 2010). Whether teachers receive adequate ICT training, adequate time to plan for lessons integrating ICT, and adequate technical and instructional support are examples of school conditions that form the current ICT integration situation in the school. Therefore, availability of a clear vision, plan and related Policies (section 2.4.a.i), infrastructure availability and accessibility (section 2.4.a.ii), providing adequate professional development (section 2.4.a.iii), technical support (section 2.4.a.iv), leadership support (section 2.4.a.v), and time, scheduling and teacher workload (section 2.4.a.vi) are institutional level factors that would fall under Conditions.

2.4.c.iii Competencies. Competencies are the knowledge and skills of teachers that impact the students' learning (Wagner et al., 2010). There are two types of competencies; hard competencies (e.g. the teachers' actual skills in using multiple ICT applications), and soft competencies (e.g. teachers' different teaching styles and confidence level in using ICT).

Accordingly, ICT competence (section 2.4.b.ii) factor falls under Hard Competencies while IT Self-efficacy (section 2.4.b.i), Teacher's Attitude (section 2.4.b.iii) and Teacher's Pedagogical Beliefs (section 2.4.b.iv) individual level factors fall under Soft Competencies.

2.4.c.iv Contexts. Contexts are any external factors that the school does not have control over, but have a great impact on the area that needs change in the school (Wagner et al., 2010). Some of these factors are the degree to which parents perceive using computers by their children as a waste of time, or whether the focus on exams reduces the time available in the curriculum to integrate ICT.

Hence Teaching Experience (section 2.4.b.v), Age (section 2.4.b.vi) and Gender (section 2.4.b.vii) individual level factors fall under Contexts for current teachers. However, if we were considering selecting teachers in the future, these factors might not fall into that category.

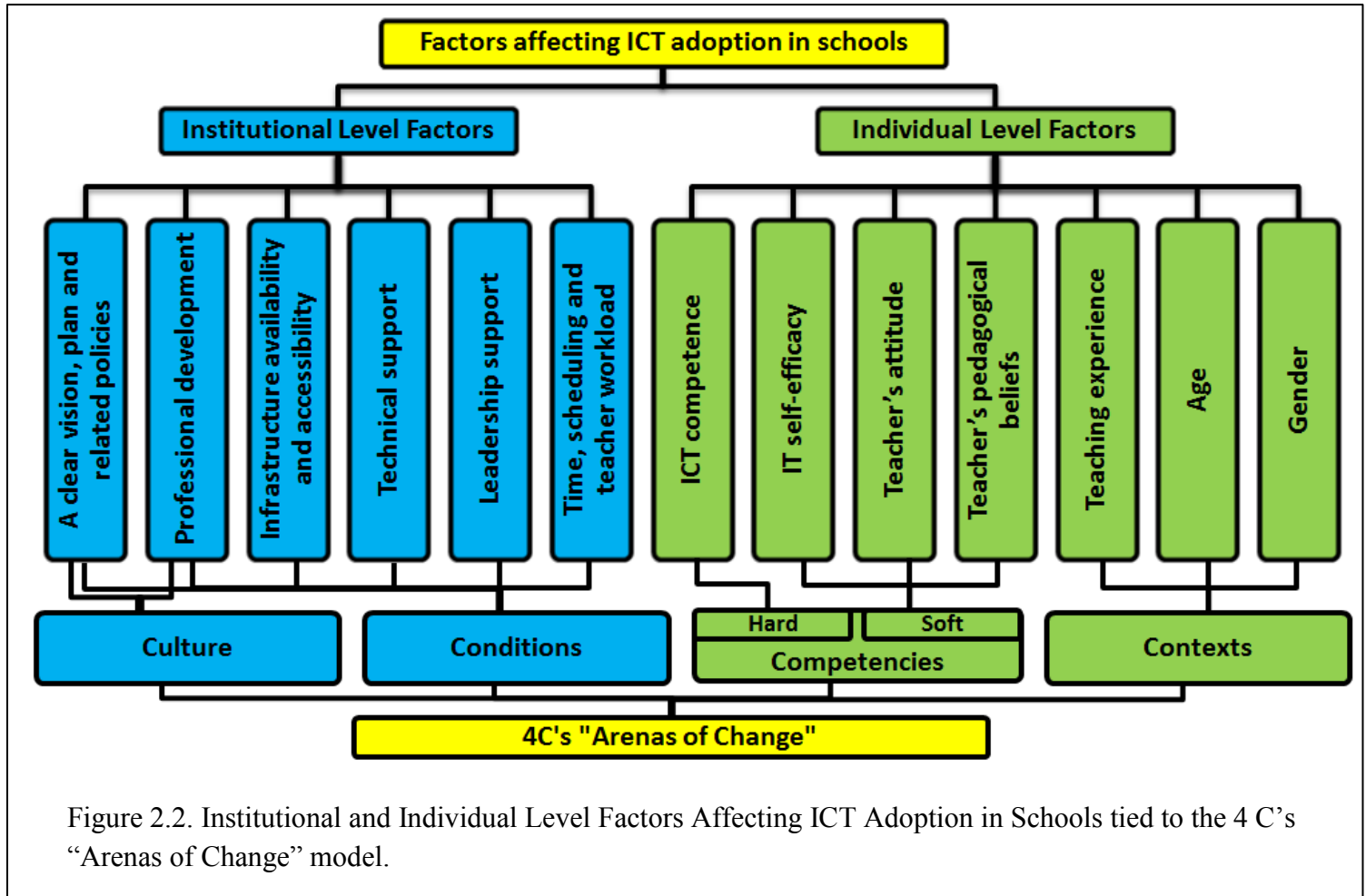


Figure 2.2. Institutional and Individual Level Factors Affecting ICT Adoption in Schools tied to the 4 C's "Arenas of Change" model.

Chapter Three – Methodology

This research was conducted in an effort to investigate which of the institutional level factors and the individual level factors, discussed earlier in section 2.4, affect school X elementary teachers' decisions to adopt ICT in education. The research methodology is based on Tony Wagner's and Robert Kegan's 4 C's model (explained earlier in section 2.4.c) where the research was carried out in three main phases. First, it studied the school culture, conditions, competencies, and contexts that are forming the current technology integration status in school X. Then it identified the ideal culture, conditions, competencies, and contexts that should be available to increase effective ICT adoption in education in the school. Finally, clear and detailed recommendations for an action plan were agreed upon to help school X make the shift from the current status to the optimum status to enhance the students' learning process.

The research followed a modified form of participatory evaluation (Cousins & Whitmore, 1998; Zukoski & Luluquisen, 2002) where teachers, as the main stakeholder in the technology integration process, took part in the evaluation process but were not involved in all of its phases. Teachers did not design the instruments, carry on data collection or design the evaluation process; rather they mainly analysed and evaluated the data collected then came up with the plan of action to implement change. Teachers' efforts to come up with the plan of action themselves should help in making the plan more realistic and achievable, and should also encourage the teachers to become agents of change as they will feel ownership of the action plan and thus support its implementation.

Although there might be some commonalities between school X case and other international schools in Egypt "Petite Generalization", the aim of this case study is not to generalize its findings to other international schools (Stake, 1995). Most of those schools have the latest ICT infrastructure (software and hardware) and expect teachers to integrate

ICT in their teaching. They also offer teachers some technical and curricular training sessions, but the majority of teachers still do not integrate ICT in their teaching or their integration efforts are not very effective to the students' learning. The research attempts to examine the following research questions:

1. Whether teachers perceive technology as an added value to the teaching and learning process?
2. Does school X culture support teachers' active engagement and collaboration for continuous improvement?
3. Whether the school conditions support ICT integration for the improvement of teaching and learning?
4. What external factors shape the context within which school X takes its decisions to integrate ICT?
5. Do school X teachers possess the required competencies to successfully integrate ICT into education?

3.1 Study Setting

The research studied the case of the elementary school in an international school in Cairo, Egypt. The number of teachers is 47 after excluding co-teachers (assistant teachers), P.E. teachers, and Quran teachers and including specialists. Co-teachers, P.E. teachers, and Quran teachers were excluded because they do not take part in planning or implementation of ICT integration in education. On the other hand, all specialists have data shows in their classrooms and some of them have interactive whiteboards as well; where they are expected to integrate ICT in their teaching by the school administration. Out of these 47 teachers, there are 10.6% males and 89.4% females. Their average years of experience are 11 years. Seventy percent earned their master's degree, and 30% have a bachelor degree.

The elementary school student body is comprised of 400 students. There are a total of 20 classes in the elementary school (G1 - G5); four classes in each of the five grade levels, with an average of 21 students per class. The elementary building has five main learning centers; one in the ground floor and two on each of the first and second floor. Each of the four classes within a grade level share one of these learning centers; where there are different learning stations like a math corner, a reading corner, and a board games corner.

Although teachers are expected by the administration to integrate ICT in their teaching, there is no clear written school wide policy for the integration process. Elementary teachers receive a couple of training sessions whenever a new technological product is introduced like new grading software, online school platform to send student work, or interactive whiteboards. Teachers rarely receive any training on the latest educational web tools that can be used in the classroom.

The core subjects' curriculum is based on the McREL (Mid-Continent Regional Education Lab) standards. The ICT curriculum is based on the NETS (National Educational Technology Standards). There is an integration project between the core subjects and the ICT curriculum within each grade level, where the grade level leader and the ICT teacher communicate to choose one of the themes that the students are learning about in the classroom. The students then are asked to create a product about this theme using the software application they are learning in the ICT class (e.g. creating a PowerPoint presentation about an endangered animal).

All elementary school classrooms and specialists' classrooms are equipped with a computer and a data show. The computers are connected to the Internet, intranet (the school internal network), network printers, school management system, library management system, and have access to a software server that includes cutting-edge computer applications and various licensed electronic educational resources. All grade one classes have an interactive

whiteboard, while grades two and three each have one interactive white board in its learning center in the hall outside the classrooms. There are two ICT labs in the elementary school each equipped with 22 student computers which is more than the number of students per class, in addition to a teacher computer, an interactive whiteboard, a data show, an A4 LaserJet printer, an A3 coloured printer, a scanner, a set of speakers, and 23 headsets.

3.2 Participants

3.2.a Survey. The survey was sent to the whole population of 47 elementary class teachers and specialists, after excluding co-teachers (assistant teachers), P.E. teachers, and Quran teachers as explained earlier in section 3.1. Out of these 47 teachers, there are 42 females (89.4%) and five males (10.6%). Their average years of experience are 11 years, 70% earned their masters, and 30% have a bachelor degree.

3.2.b Focus group. For the sake of studying in depth the case in the elementary school, participants in the focus group were chosen from the 47 elementary teachers according to stratified purposeful sampling. Stratified sampling guarantees that the main subgroups that need to be studied are represented in the sample (Crossman, 2012). Teachers that responded to the survey were divided into two subgroups based on their responses according to ICT integration level. Then a stratified purposeful sample of high ICT integrators and low ICT integrators was chosen to participate in the focus group to ensure pooling of diversified points of view during the discussion. The focus group was comprised of ten teachers.

3.3 Data Collection Methods

The research followed a mixed methods approach, where qualitative and quantitative methods of data collection were used. Using mixed methods gave the research the richness of

both, a deep and comprehensive but time-consuming understanding of qualitative research, and the more-representative and spread but shallow understanding of quantitative research (Creswell, 2008). The survey as a quantitative method of data collection gave a general understanding of the ICT integration status within the elementary school, while the focus group as a qualitative method of data collection offered a detailed and in-depth picture not only for the current ICT integration status but also for the desired status, and recommendations to bridge the gap between the two standings.

3.3.a Survey. The survey was conducted to the whole population of 47 elementary class teachers and specialists, for the sake of understanding the technology integration situation in the elementary school. Surveys are usually the best tool to use to collect large amount of data in the least time and cost (Russ-Eft & Preskill, 2001). An informed consent form was put at the beginning of the survey, to ensure that teachers understand the purpose of the research, their involvement level, and their expected participation time (see Appendix 1 and 3). Respondents were asked to fill the survey only if they agree to participate in the research. The survey was online and created using survey monkey for ease of data collection.

Survey questions were designed based on Tony Wagner's and Robert Kegan's 4 C's model, which suggests that there are four "arenas of change" that needs to be studied to carry out transformation with-in school - culture, competency, conditions, and contexts (Wagner et al., 2010). Surveys helped in getting a better understanding of the current technology integration situation in the elementary school "as is". The survey had 54 questions, all closed ended that required respondents to choose their response from a Likert scale. The survey was translated into Arabic, so that the Arabic and Religion teachers could respond to it. To encourage teachers to respond to the survey, two 50% discount coupons from top outlets and hangouts in Egypt were offered as an incentive. Teachers who emailed the researcher the code that appeared upon completion of the survey claimed their right to receive this

incentive. The code does not present a threat to the anonymity of the respondents as it was the same code for all completed responses.

The survey was used to learn about 1) the demographics of the elementary teachers, 2) the factors within the school's culture, conditions and context that shape the teachers' ICT integration patterns, 3) the teachers' competencies in using multiple ICT applications in education, 4) and also how they use technology in the classroom to enhance the teaching and learning process.

It is crucial to ensure the validity and reliability of the survey instrument. According to Joppe (2000) validity means that the instrument is precise as it measures what it is anticipated to measure (as cited in Golafshani, 2003). To ensure validity of the survey instrument, three experts in the field of ICT integration were asked to examine whether the survey answers the research questions. While reliability means that the survey results are consistent over time and that they represent the whole population studied (Joppe, 2000 as cited in Golafshani, 2003). Reliability of the survey was addressed by piloting it with group of teachers from different schools other than school X. After taking the survey, each member of the group was asked separately about his/her interpretation of key questions in the survey to confirm that the questions were understood in the same way by all teachers taking the survey. The pilot group also checked the accuracy of translation of the survey's Arabic version.

3.3.b Focus group. Focus groups help in studying a situation deeply as it generates an adequate environment that makes participants feel comfortable to honestly reflect about a specific matter (Nielsen, 1997). Participants in the focus group were chosen from the 47 elementary teachers according to stratified purposeful sampling. Teachers that responded to the survey were divided into two subgroups based on their responses according to ICT integration level. Then a stratified purposeful sample of high ICT integrators and low ICT

integrators was chosen to participate in the focus group to ensure pooling of diversified points of view during the discussion. To decide on the teachers' ICT integration level, the choice was based on the results of a self-selection question in the survey which examined the stage of ICT adoption and integration teachers believe they are currently in. This self-selection question was based on Rogers' and Shoemaker's (1971) Distribution of Adopter Categories model. In this model the degree of earliness to which individuals adopt new ideas (e.g. ICT integration) is divided into five categories; innovators, early adopters, early majority, late majority, and laggards. For the sake of clarity for teachers, the model was modified into four stages only; awareness, learning the process, understanding and applying the process, and facilitating the process. Accordingly, teachers who selected they are in the "awareness" and "learning the process" stages had been considered low ICT integrators, while teachers who selected they are in the "understanding and applying the process" and "facilitating the process" stages had been considered high ICT integrators (see Figure 4.5).

Upon collecting and analyzing the data from the surveys, the focus group of 10 teachers met to discuss the current ICT integration situation "as is" compared to where we want "to be" as a school. Teachers filled a consent form before meeting for the discussion (see Appendix 5 and 6). The discussion was moderated by the researcher and lasted for two hours (see focus group protocol, Appendix 7). They looked into the culture, conditions, competencies, and contexts that motivate or discourage ICT integration decisions by elementary teachers in school X. Teachers in the focus group came up with some recommendations for an action plan to reach the desired degree of technology integration in school X.

3.4 Data Collection Process

The first step in the data collection process was getting the thesis proposal approved by the research supervisors. Further approvals were obtained from the following two entities:

1) the Institutional Review Board (IRB) at the American University in Cairo (AUC); and 2) the Head Principal and Elementary Principal of school X to carry on the research in the school premises.

The survey was created using survey monkey (see Appendix 2 and 4) and upon receiving both approvals, participants were sent a link to the electronic survey on their school emails. Data collected using survey monkey was analysed, and focus group participants were identified (check section 3.2). Teachers participating in the focus group were contacted by email to determine adequate times in their schedules to carry on the focus group as they needed to meet once for two hours. The researcher moderated the focus group and data analysed was used to run the discussion within the focus group. Data collected from the focus group included recommendations for the plan that school X needs to carry on to change its current ICT integration situation to the desired situation to improve the teaching and learning process.

3.5 Data Analysis

3.5.a Survey. The quantitative data from the survey was coded, entered to Excel, and analysed using a Statistical Product and Service Solutions (SPSS); a program designed to analyze data to obtain descriptive statistics that identifies patterns and trends. The data was presented in the form of charts and tables to make it easy to read and analyze. Data and results obtained from the survey were used to stratify the focus group sample and to identify the integration trends in the elementary school to guide the focus group discussion.

3.5.b Focus group. The expected outcome of this research is a realistic, clear, and achievable action plan to increase the effectiveness of ICT integration in school X. As a result, the data was analysed exhaustively by the researcher to ensure correct interpretation for the current ICT integration situation of the school. Then it was further analysed in the

focus group to come up with the difference between the situation in school “as is” and where we want “to be”, with regard to the culture, conditions, competencies, and contexts that motivate or discourage ICT integration decisions by elementary teachers. This helped teachers in the focus group to come up with recommendations for the plan to carry on the change process.

Chapter Four – Findings

The purpose of this research was to examine the factors that affect elementary teachers' decision, in an Egyptian international school, to integrate information and communication technologies (ICT) in education. This research was conducted in two phases; the first phase was administering an online survey and the second phase was moderating a focus group. The survey and focus group helped in collecting and analyzing the data needed to answer the research questions. This chapter will present and elucidate the research findings. The research attempts to examine the following research questions:

1. Whether teachers perceive technology as an added value to the teaching and learning process?
2. Does school X culture support teachers' active engagement and collaboration for continuous improvement?
3. Whether the school conditions support ICT integration for the improvement of teaching and learning?
4. What external factors shape the context within which school X takes its decisions to integrate ICT?
5. Do school X teachers possess the required competencies to successfully integrate ICT into education?

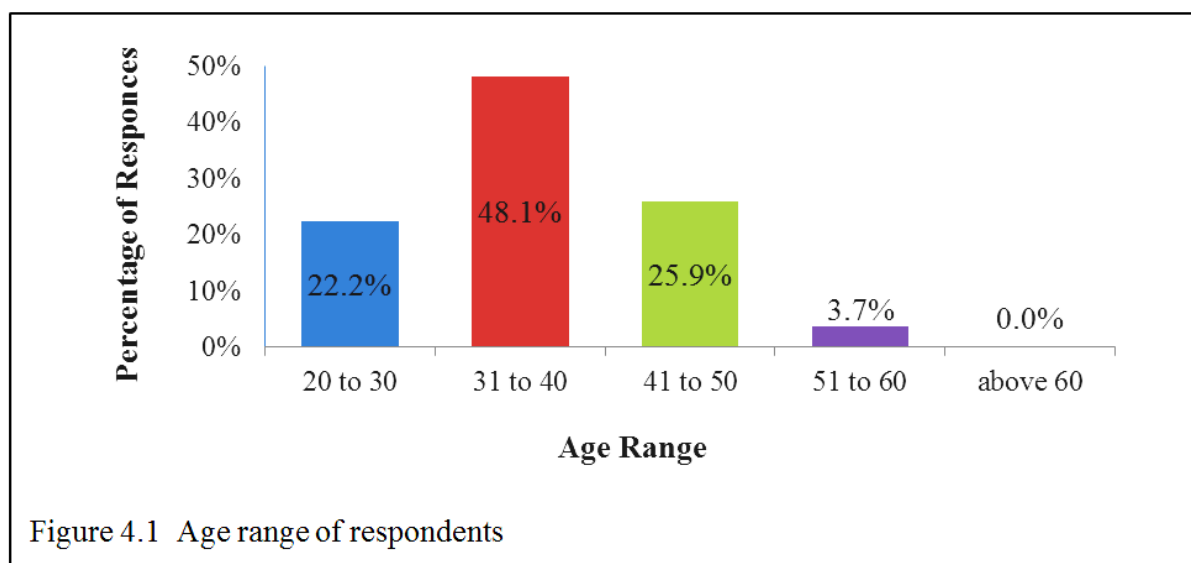
4.1 Demographics of Participants

4.1.a Survey respondents. A total of 27 out of 47 teachers responded to the survey; which represents 57.4% of the elementary teachers after excluding co-teachers (assistant teachers), P.E. teachers, and Quran teachers and including specialists (see section 3.1). Cohen, Manion, and Morrison (2000) affirm that it is sufficient to have a response rate of

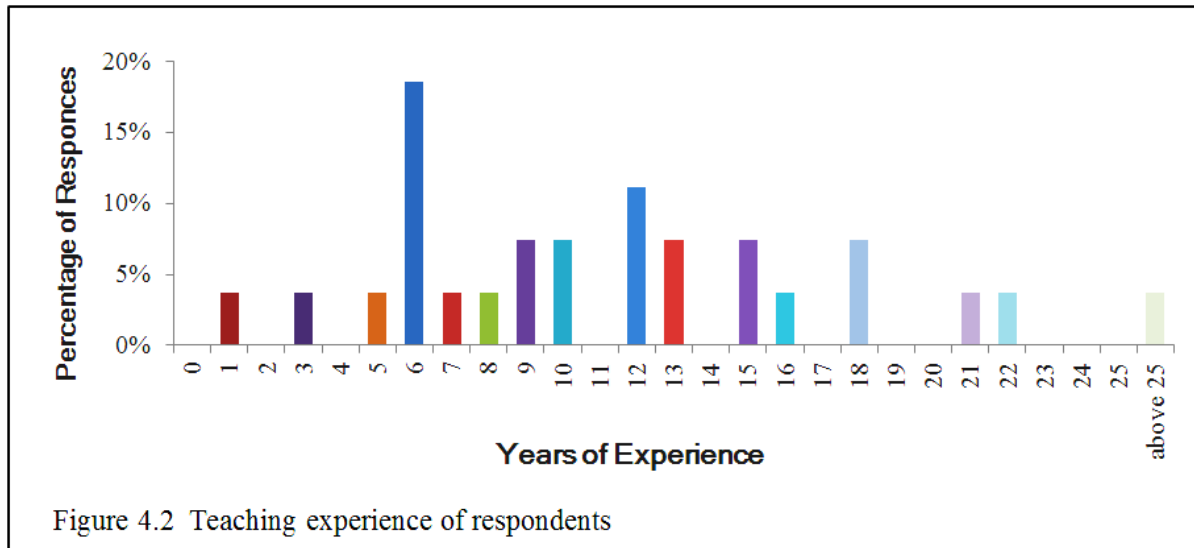
40% to 50%. Appendix 8 shows a list of the tables that represent the basic descriptive statistics of the survey respondents.

4.1.a.i Gender. Question one indicated that out of the 27 teachers that responded there were 24 females (88.9%) and only three males (11.1%). This percentage is representative of the whole population as the original distribution of the 47 elementary teachers was 42 females (89.4%) to only five males (10.6%).

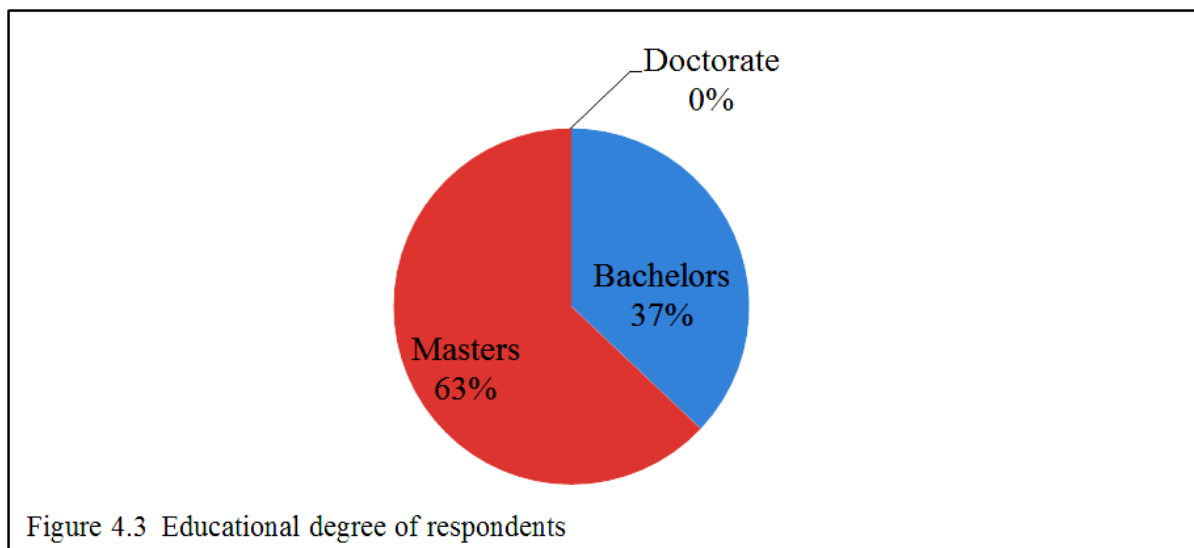
4.1.a.ii Age. Respondents' age varied between 20 and 60 years old; where the majority of teachers were between 31 and 40 years of age as represented in question two (Figure 4.1).



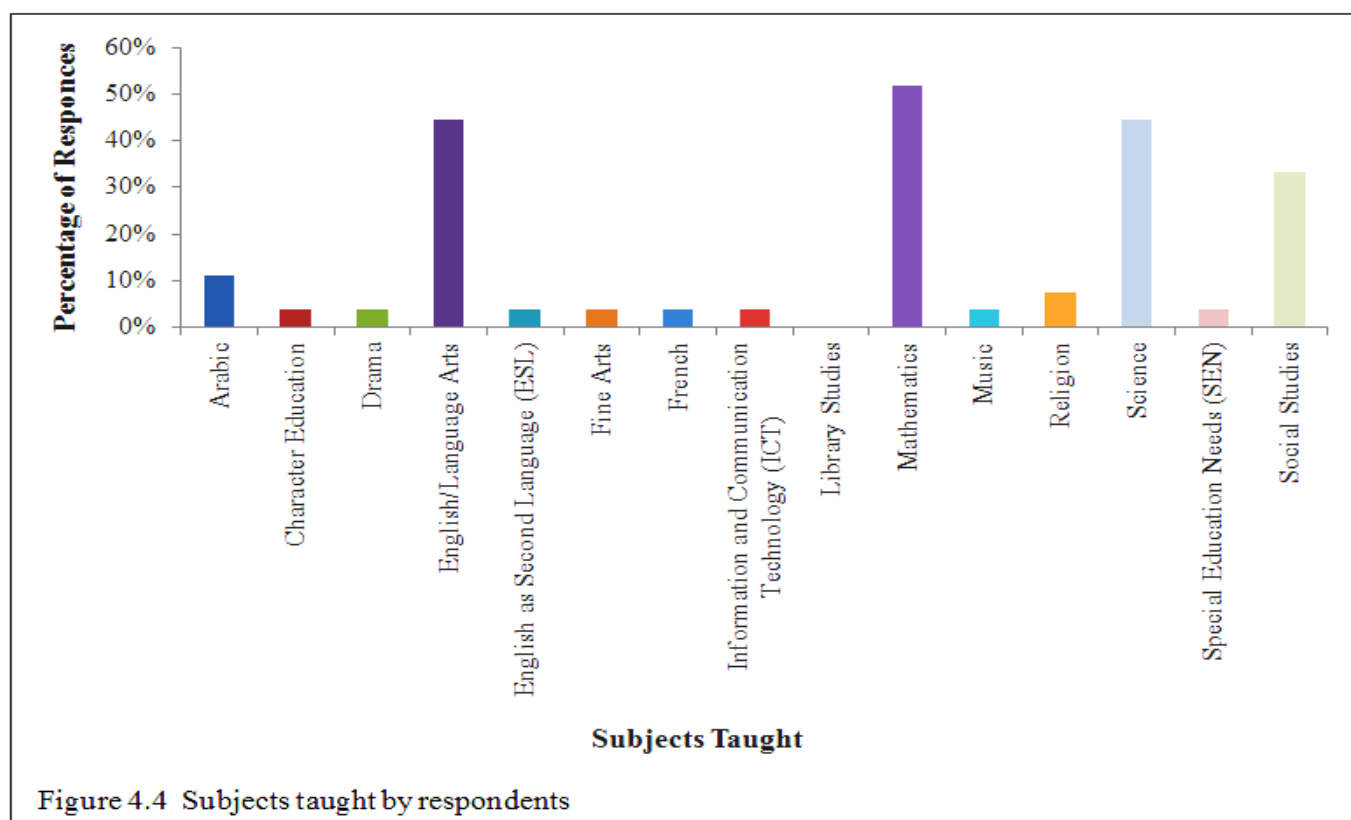
4.1.a.iii Teaching experience. Although the results of question three seem to be skewed towards six years of experience (18.5%), the average years of experience of the survey respondents are 11 years which implies that the majority of elementary teachers are highly experienced (Figure 4.2).



4.1.a.iv Educational degree. Respondents' highest educational degrees attained were represented in question nine as follows: 63% earned their masters' degree and 37% have a bachelors' degree (Figure 4.3). Teachers in school X are required to either be certified or have a degree in education. In this instance, a considerable number of teachers who have bachelors' degree were enrolled in masters in education programs or other educational degrees.

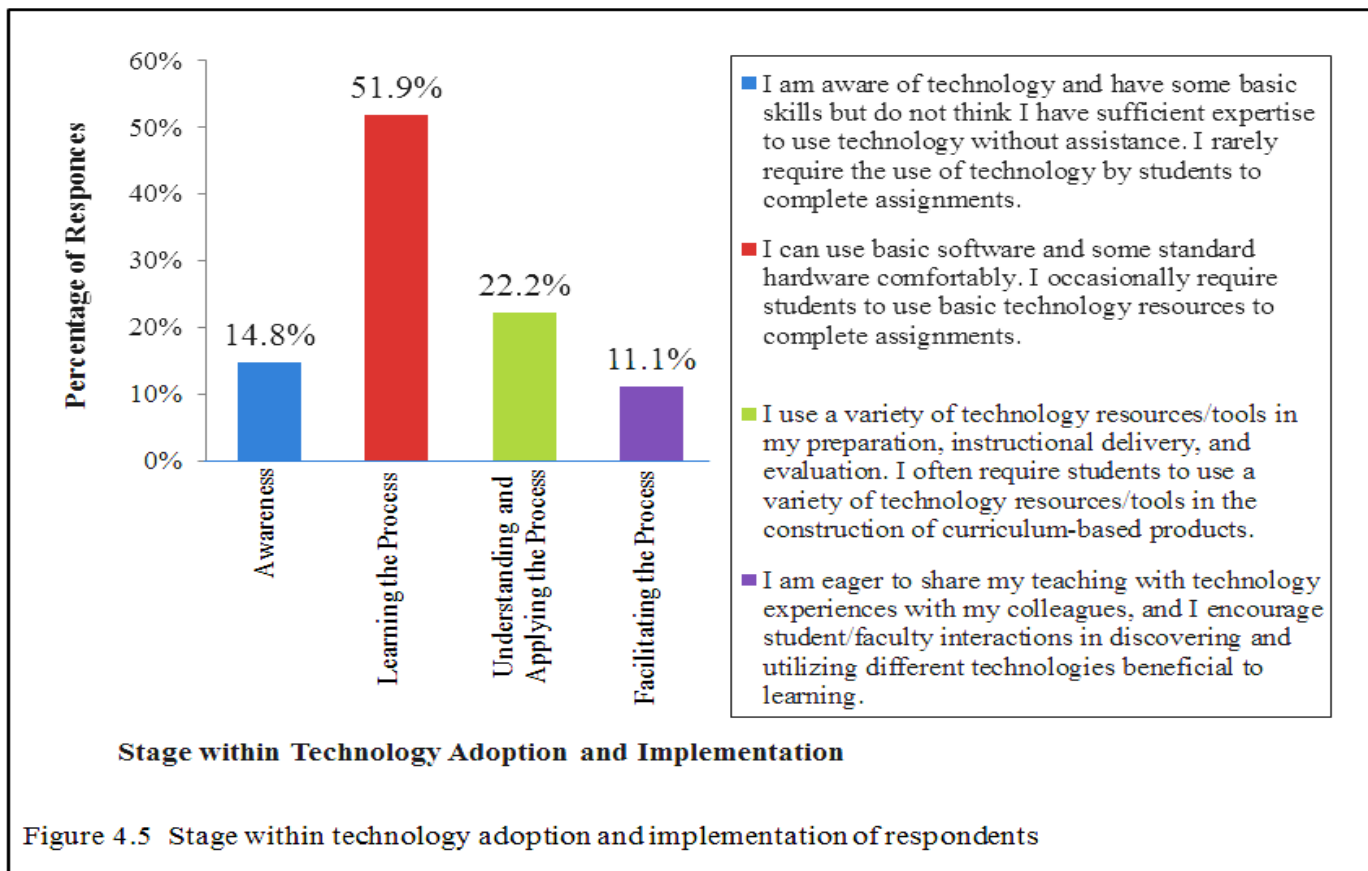


4.1.a.v Subjects taught. In elementary, class teachers teach the four core subjects; Language Arts, Mathematics, Science and Social Studies. Responses in question 5.a (Figure 4.4) show that the highest rates were in these four subject areas which imply that the majority of teachers who responded to the survey are class teachers. The results also show that specialist teachers from all subject areas were represented except for the library studies.



4.1.b Focus group participants. Ten teachers out of the 47 elementary teachers participated in the focus group which represents 21.3%. All ten teachers responded to the survey and were chosen according to stratified purposeful sampling based on their responses according to their ICT integration level. To decide on the teachers' ICT integration level, the choice was based on the responses of question 10 (Figure 4.5) in the survey which examined the stage of ICT adoption and integration teachers believed they are currently at. Where five of the ten teachers chosen selected that they were either in the "awareness" stage or in the "learning the process" stage while the other five teachers chosen selected that they were

either in the “understanding and applying the process” stage or in the “facilitating the process” stage.



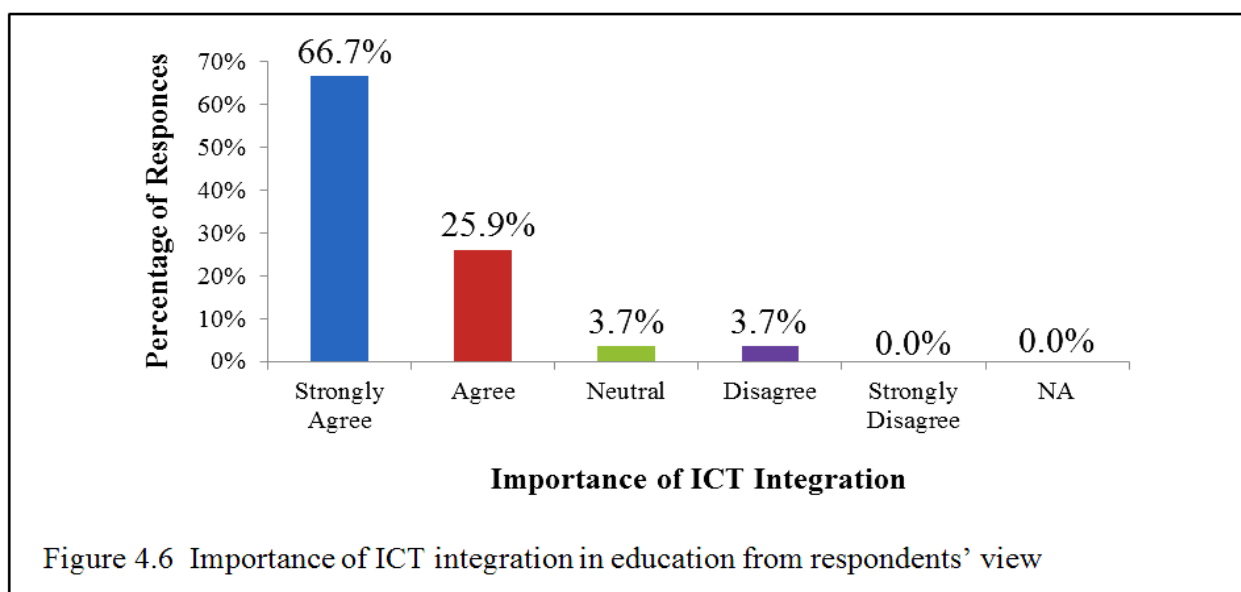
All focus group members were females. Seventy percent were class teachers and 30% were specialists. Seventy percent earned their masters' degree and 30% have a bachelors' degree. Forty percent were between 20-30 years old, 40% were between 31-40 years old and 20% were between 41-50 years old. The teachers' years of experience ranged between 3 and 16 years, and the average was 8.5 years.

The following sections of this chapter will be summarizing the findings of both data collection methods used in the research, where the results from the survey and the focus group will be combined together and presented under the umbrella of each research question. In reporting the findings of the survey, the “strongly agree” and “agree” percentages will be

added together and referred to as “agree” and the “strongly disagree” and “disagree” percentages will be added together and referred to as “disagree”.

4.2 Importance of ICT Integration

The first research question was designed to study the degree to which teachers perceive technology as an added value to the teaching and learning process. Question 11 in the survey addressed this issue. The results (Figure 4.6) showed that 92.6% of the respondents perceived that ICT integration in instruction is important for enhancing students' learning while less than 4% regarded ICT integration as less important. These percentages indicate that the majority of elementary teachers had a positive attitude towards ICT integration.



In the following three sections data from responses for survey questions are reordered for ease of reading the graphs and looking at trends where the questions are sorted from highest “strongly agree” and “agree” response percentages to the lowest “disagree” and “strongly disagree” response percentages.

4.3 Culture

The second question investigated whether school X culture supports teachers' active engagement and collaboration for continuous improvement. Studying the current school culture was very essential as it shapes all school processes. Having a school culture that highly considers its shareholders' input enforces a positive spirit which enhances the educational process through increasing teachers' and students' desire for accomplishment. Hence, eight questions were investigated to determine the degree to which all stakeholders (including the school administration) contributed to form school X culture. Figure 4.7 summarizes responses for the eight questions.

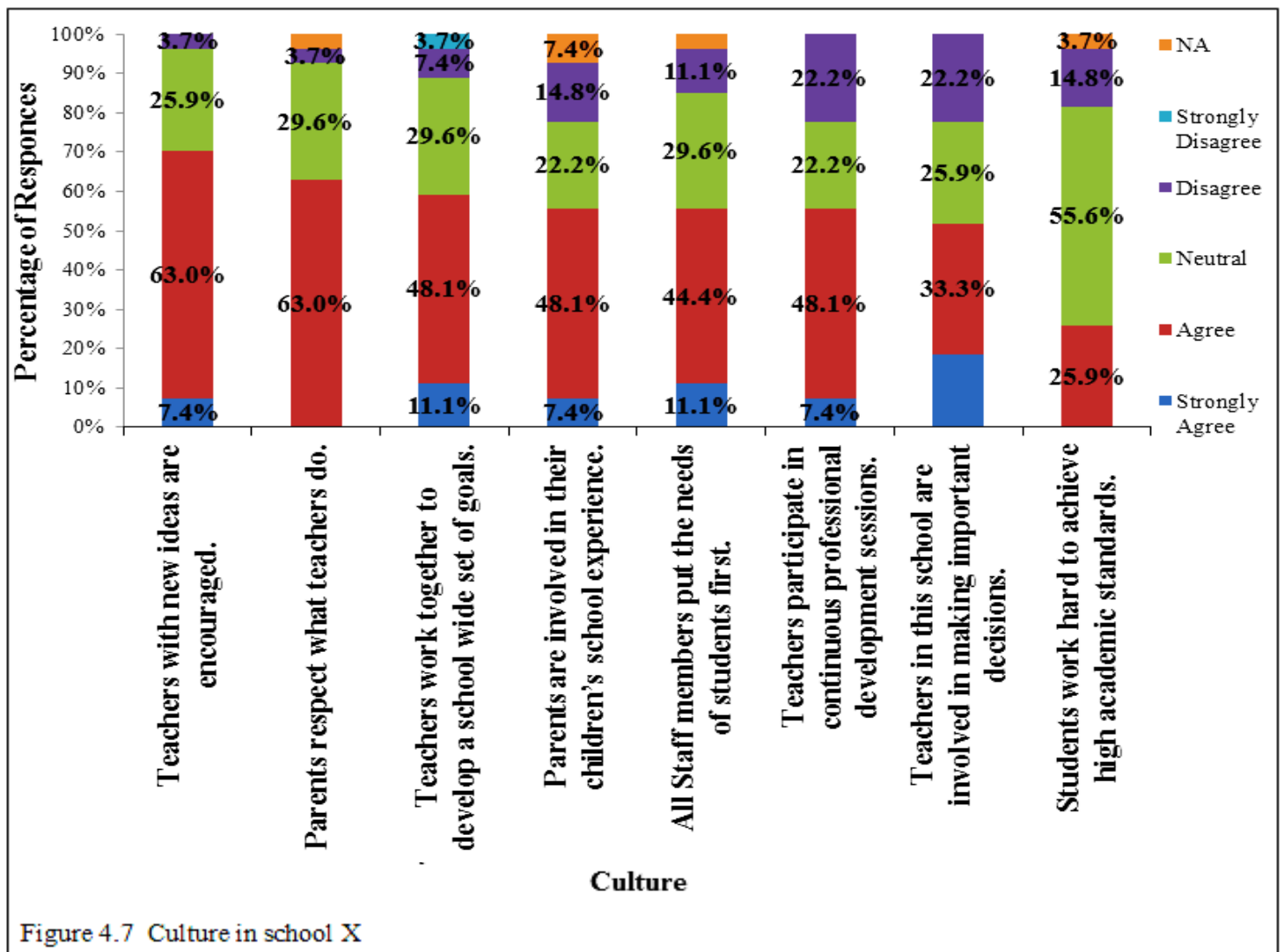


Figure 4.7 Culture in school X

The majority of the teachers believed that their new ideas are encouraged by the school, where 70.4% agreed to this aspect, 25.9% were neutral, and only 3.7% disagreed. Focus group participants agreed that no change is needed in this area as the survey results and their own personal experiences confirmed that the school encourages teachers to bring forward their new ideas and suggestions to develop the curriculum, teaching strategies, behaviour management systems, or any other areas related to the teaching and learning process.

A relatively high percentage of teachers (63%) agreed that parents respect what teachers do while only 3.7% disagreed. Based on this agreement level, the majority of elementary teachers believed that parents have high confidence that teachers always act towards the best interest of their children where teachers are committed to provide high academic, behavioural and emotional support for them. There was an agreement within the focus group participants that the results of this question were adequate as parents would not show such confidence if the whole school environment was not working towards making parents feel this way.

The third question responses showed that 59.2% of respondents agreed that teachers in this school work together to develop a school wide set of goals, while 11.1% disagreed. This rate showed that the school has reasonable two way communication to ensure that teachers are frequently involved in improving students' education. Focus group confirmed this relatively high agreement percentage by giving examples of school keenness to discuss and analyze students' scores and reports from standardized tests (e.g. Measures of Academic Progress tests – MAPs) after each testing session to decide on a set of academic goals for enhancing the quality of education students receive. On the other hand, the group noted the importance of taking into consideration that this is the only item in the culture section where some teachers strongly disagreed. They proposed that this might be due to some contextual

factors like the school commitment to abide by the accreditation bodies' recommendations. Still focus group participants believed that to improve the school culture and teachers' commitment, perhaps it is time to revisit the school goals to increase teachers' input in them.

Parents' involvement in their children school experience was agreed upon by 55.5% of respondents and disagreed upon by 14.8%. Parents' involvement is one of the main factors that facilitate and support the educational process as students need to feel that the same expectations are required from them from both school and home. During the focus group discussion, teachers explained how parents' involvement is encouraged by the school; the teachers' and administrators' email addresses are updated yearly on the school website so that parents can request a teacher or administrator meeting whenever they need. Likewise, the Parents Teachers Association (PTA) has an active role in the school where they take part in organizing events for students and families as well as voicing parents' concerns to the school administration through monthly meetings. The focus group participants believed that parents' involvement level could still be increased through offering workshops for parents that would provide them with tools to learn more about the curriculum, ways to help their children study and do their homework, ways to deal with behavioural issues and work habits, etc.

When teachers were asked whether they perceive that all staff members put the needs of students first, 55.5% agreed while 11.1% disagreed. This question was inquiring about all staff which includes teachers and administrators. Teachers' responses showed that there is no general agreement on this cultural factor, where a considerable amount of teachers believed that sometimes some teachers or school administrators make decisions that would contradict with the students' needs. During their discussion, focus group participants mentioned that teacher's failure to use differentiated instruction in the classroom or administrator's failure to carry on regular supervision for teachers are examples of not putting students' needs first. The focus group agreed that teachers and administrators should be continuously reminded of

the school mission and vision in all staff meetings which take place throughout the year to ensure that all staff members are putting students' needs first.

About 55% of teachers agreed that they participate in continuous professional development sessions, while 22.2% disagreed. School X devotes several professional development sessions/days for its staff; one week in the beginning of the academic year before students return to school, a whole day twice a year where students take these days off, and every other Tuesday where students leave early and teachers stay for about 2 hours. Nevertheless, the results showed a relatively high disagreement level. The focus group participants pointed out that this disagreement percentage is due to teachers' feeling that some of these development sessions are imposed on them, their topics are not in the areas they need or their quality is not up to their expectations. The group proposed that 1) professional development workshops for teachers should be chosen by teachers, 2) Tuesday after school sessions should be better planned to ensure their quality especially that they are the most frequent ones teachers get, and 3) sessions should supply teachers with knowledge in areas they really need. Teachers added that there is a need to rebuild teachers' trust in these sessions as they believed that these concerns were not sufficiently addressed in the past academic years.

The survey showed that more than half of the teachers (51.8%) agreed that the school administration involves them in important decisions like developing different curricula, adopting new textbooks, introducing new software or programs, etc. However, a significant percentage of respondents (22.2%) disagreed to this point. This survey item raised a lot of argument within the focus group where teachers had opposing opinions regarding their involvement in decisions. Teachers pointed out that these polarized opinions are due to the fact that although the school in many occasions involves teachers in decision making, this involvement is sometimes at a late stage where feedback and change becomes difficult. All

focus group participants agreed that policies and decisions in any school related matter would be much more effective if teachers were part of it where they will feel more ownership and responsibility towards applying them.

Students have different levels of obligation towards excelling in their academics. In regards to the extent to which students work to achieve high academic standards, only 25.9% of elementary teachers agreed that students work hard, while 55.6% were neutral and 14.8% disagreed. The response trend of this question was noticeably different than all the other culture questions. The focus group participants related this high percentage of responses of neither agreeing nor disagreeing to the way they thought of the question while answering it. Teachers explained that they thought about each student in their classroom to determine their level of commitment to high academic achievement and upon finding that students are almost evenly distributed between high achievers and low achievers, they tended to respond with “neutral” rather than agreeing or disagreeing. The focus group participants recommended that teachers should set high academic expectations for students by showing them samples of the expected work and that effective ICT integration might also increase student interest in the educational process and consequently increase their commitment to achieve high academic standards.

4.3 Conditions

The third research question examined whether the school conditions support ICT integration for the improvement of teaching and learning. Studying conditions provides a good understanding of the school regarding its policies, facilities, infrastructure, professional development, leadership and technical support. These factors shape the environment within which teachers can effectively integrate ICT into education. School X conditions were analysed through 12 questions in the survey, and a summary of the responses is represented below in figure 4.8.

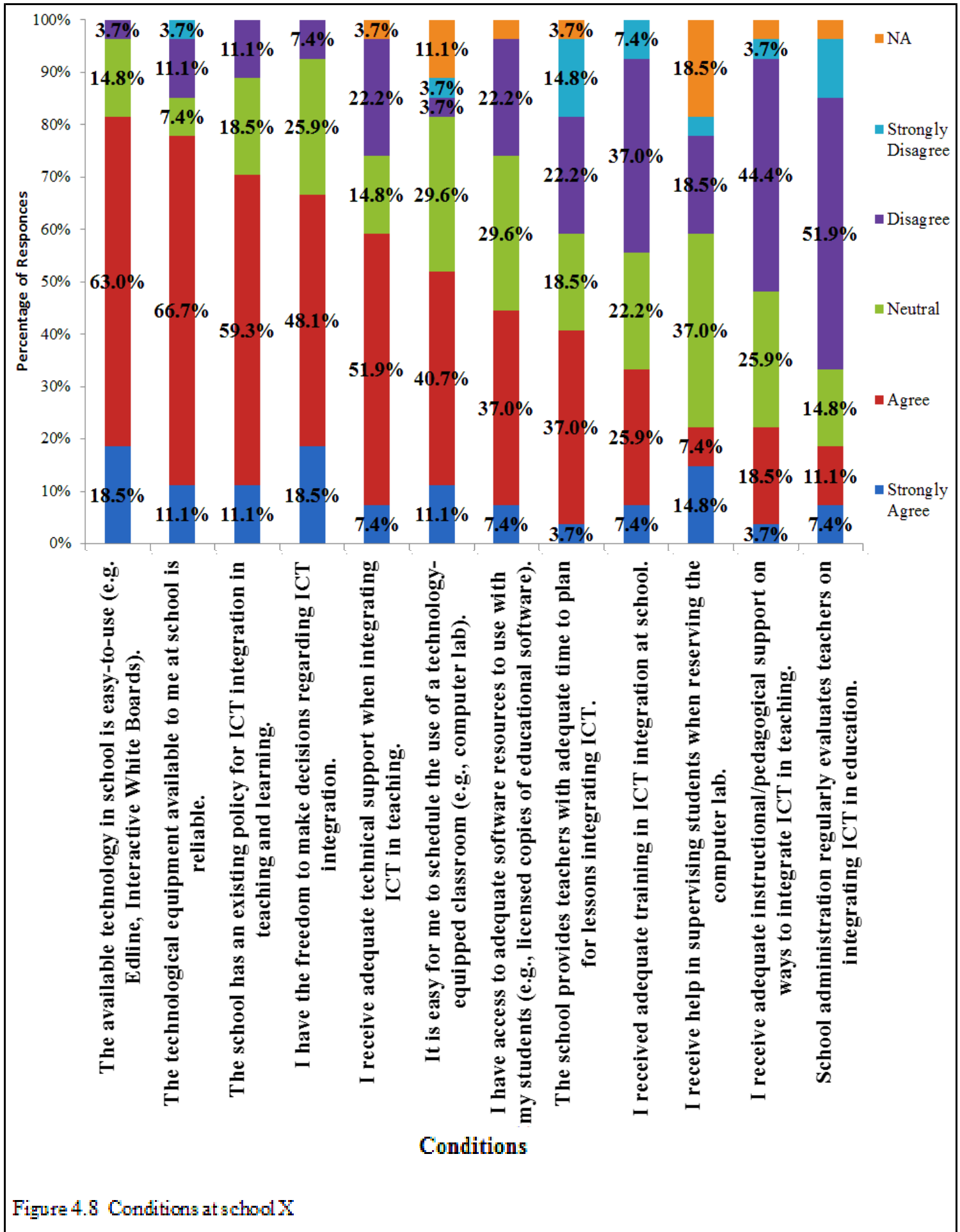


Figure 4.8 Conditions at school X

There was a great agreement by respondents with regard to the ease of using the available technology where 81.5% agreed and only 3.7% disagreed. The focus group participants agreed that the available technology is easy to use but that there are minor problems which can be resolved to enhance the situation, like having printers available in each grade level center rather than in the workrooms for ease of accessibility.

When teachers were asked whether the technological equipment available for their use at school is reliable, an extremely high percentage of teachers agreed (77.8%), while only 14.8% disagreed. It is essential to have reliable technological equipment to encourage teachers to integrate ICT in their teaching. Internet connections should be speedy and stable, computer hardware and software should be up to date with high processing speed, and printers need to be available. Although the agreement percentage was high, the focus group participants argued that computers in classrooms are outdated and that there are no student stations in their classes; there is only one computer for the teacher's use. The focus group participants recommended that all computers in classrooms be renovated and that at least two students' computers should be available in addition to the teacher computer.

Most of the elementary teachers agreed (70.4%) that the school has an existing policy for ICT integration in teaching and learning, and only 11.1% disagreed. Upon discussing this point with the focus group, they argued that the responses for this question do not reflect the real situation. They believed that teachers including themselves gave such a high agreement percentage as they considered that as long as the school invests in technological infrastructure, software, and ICT training sessions then the school must have a policy for ICT integration. Focus group teachers recommended that the school should have a clear written ICT integration policy, because in spite of those school efforts some of those processes (like ICT training) need to be evaluated to ensure their effectiveness to the integration process.

The survey results showed that 66.6% of elementary teachers agreed that they have the freedom to make decisions regarding ICT integration, and only 7.4% disagreed. This implies that the majority of teachers believe that it is their decision to integrate ICT into their teaching since the school administration encourages them - if they choose - to integrate ICT in every lesson they are teaching. Focus group participants saw that this factor is one of the conditions that does not require change.

About 59% of the respondents agreed that they receive adequate technical support when integrating ICT in teaching while 22.2% disagreed. Technical support in the school is facilitated through the presence of an IT service desk which provides multiple ways of communication with the IT department and ensures speed and efficiency of technical support. The focus group supported the results of this question and agreed that this condition factor does not raise major concerns so there is no need for change in this area.

When teachers were asked about the process of scheduling the use of technology-equipped classroom (e.g. computer lab), 51.8% agreed it is easy while only 7.4% disagreed. The computer lab schedules are posted on the door of each lab in addition to a reservation sheet in order to identify the free slots and make lab reservation easy for teachers. Teachers bring students to the computer lab to practise some skills they learnt in the classroom through using the Internet or educational software programs. They also use it to produce a technological product on a topic they had studied e.g. creating a story using a word processor, or designing a PowerPoint presentation. Focus group participants argued that although it might be easy to reserve the computer lab, the decision to bring students from the classroom to the computer lab is sometimes hard because of wasted transition time from and to the classroom.

The next question in the school conditions section required teachers to select their agreement level to having adequate access to software resources to use with their students

like licensed copies of educational software. Approximately 44% of the teachers agreed that they have access, 22.2% disagreed, and 29.6% were “neutral”. There is a multimedia server on the school network and extra-curricular educational CDs for teachers to check out from the library, but many teachers are unaware of the availability of such resources. During the focus group, teachers mentioned that they sometimes coincidentally bump into a great resource that they could have used in the classroom but they were never aware of its existence in school. They believed that this makes students lose on important educational opportunities. Teachers proposed that the school administration develop a database of all multimedia resources available in school and make it simple and easily accessible for teachers.

Upon examining whether the school provides teachers with adequate time to plan for lessons integrating ICT, 40.7% of teachers agreed while 37% disagreed; these close percentages indicate that teachers' opinions are almost split equally as this factor highly depends on teachers' workload and how they can use it in planning for ICT integration. The focus group participants recommended that teachers' schedules should have adequate time allotted for planning lessons integrating ICT and that the school should provide teachers with lesson plan models to get ideas for creating their own innovative lesson plans. Supplying teachers with such resources could minimize the time required to plan for the integration.

About 44 % of the teachers disagreed that they receive adequate training in ICT integration at school, while only 33.3% agreed. This relatively high disagreement percentage implies that teachers do not feel that they are given enough professional development sessions in ICT integration, i.e. they will not be competent to effectively adopt ICT in teaching. Focus group participants affirmed that they all disagreed in their responses to this question as the keyword in it was “adequate”; whereas they might be given some training, it is not adequate in most cases because of its timing within the academic year and/or the frequency of receiving follow up sessions. Teachers gave the example of training for the

interactive white board which was insufficient; one session was offered at the beginning of the academic year – this did not give them enough confidence to use it on their own in the classroom. Teachers proposed that the training sessions should be offered more frequently all through the year targeting varying competency levels, i.e., beginner, intermediate and advanced to allow teachers with different ICT skills to increase their competence level in using this technology.

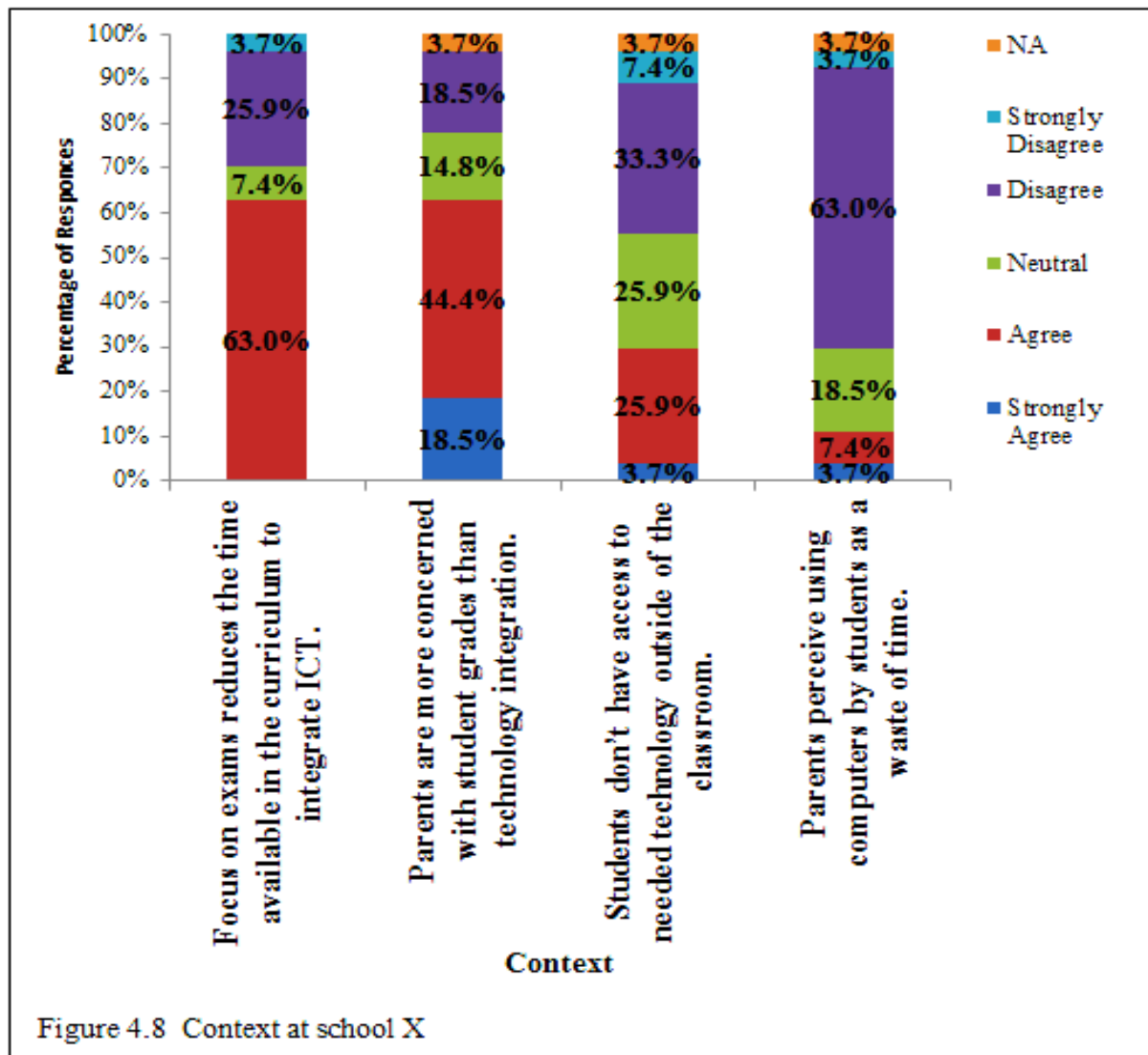
Receiving help in supervising students when reserving the computer lab had equal response rates of agreement and disagreement (22.2%), while 37% responded “neutral”. Whereas some ICT teachers believed that they are committed to stay in the lab to offer teachers technical and pedagogical support, other ICT teachers believed that they are not responsible for offering such support and felt that their schedules were tight enough. Teachers in the focus group agreed that the school policy regarding offering teachers support while they are in the computer lab with students needs to be clear for classroom teachers and ICT teachers so that all students would be offered similar technology integration opportunities.

A very high percentage of respondents (48.1%) disagreed that they receive adequate instructional support on ways to integrate ICT in teaching and only 22.2% agreed. A lot of teachers do not know about the available technological tools they can use in instruction, e.g., online web 2.0 tools, and do not know about ways to integrate these tools into their lesson plans. Focus group participants explained that some teachers need help knowing how to design lessons using the software for technological tools available at the school, e.g., interactive whiteboard. The focus group members agreed that the monthly training sessions on ways to integrate educational technology into teaching need to be provided. They also proposed hiring an ICT specialist that would mainly be responsible for supporting teachers by giving them the required pedagogical and technical knowledge and skills needed for effective ICT integration.

The majority of teachers disagreed (63%) that the school administration regularly evaluates them on integrating ICT in education, while only 18.5% agreed. The absence of regular evaluation gives teachers the impression that they are not required to integrate ICT in their teaching. The focus group participants agreed with the elementary teachers' responses that there is lack of evaluation. Nevertheless, some of them felt that evaluation would not be fair for teachers due to the unavailability of other conditions in school which should enforce the integration process such as inadequate training and not having a clear written policy for ICT integration. Consequently the focus group recommended that regular evaluations for ICT integration should take place after looking into all school conditions that raised concerns during the focus group discussion.

4.4 Context

The fourth research question analyzed the external factors that shape the context within which school X takes its decisions to integrate ICT. As these factors depend on the external environment including pool of existing parents, students, teachers, and accreditation bodies, the school has minor influence on all aspects enforced by them. The following four survey questions examined some of the context factors that affected the level of ICT integration at the school. Figure 4.9 shows the results of these survey questions.



The focus on exams reduces the time available in the curriculum to integrate ICT; this context factor was supported by 63% of the respondents, while 29.6% disagreed. The students have to undergo several exams throughout the year between standardized and local tests which require spending a considerable amount of time in getting students prepared. The focus group confirmed that MOE exams, MAP tests, and the school's on-going tests and quizzes lessen the time available to fit in lesson plans that integrate ICT into the curriculum and that those tests are indispensable to the educational process. As a result, the group believed that no change could be proposed for this factor.

The results of the second question suggested that teachers believe that parents are more concerned with student grades than technology integration; whereas 62.9% of respondents agreed to that, only 18.5% disagreed. The focus group pointed out that in spite of parents' perception of the importance of using computers, as suggested by teachers responses to question 1, they rank lower on their priority list as an educational outcome than do grades which parents regard as critical to students' future. Teachers believe that this result is a typical representation of the Egyptian parents' culture, which is evident in some parents' concern in checking their children's core subjects' grades only and neglecting meeting specialist teachers even if their children are failing in one of those subjects.

Upon inquiring whether students do not have access to the needed technology outside of the classroom, 41.1% of elementary teachers believed that students have access, 29.6% believed otherwise and 25.9% were "neutral". The focus group perceived the level of students' access to technology as very low in spite of the fact that technology is becoming a highly essential component of everyday life. Teachers pointed out that some students do not own a printer, and either do not have a stable Internet access or their elder siblings take control over the only computer available at home. Focus group participants recommended that the school should inform parents at the beginning of the year with all technology requirements students would need to have access to at home to be able to accomplish the required work like research and science fair projects.

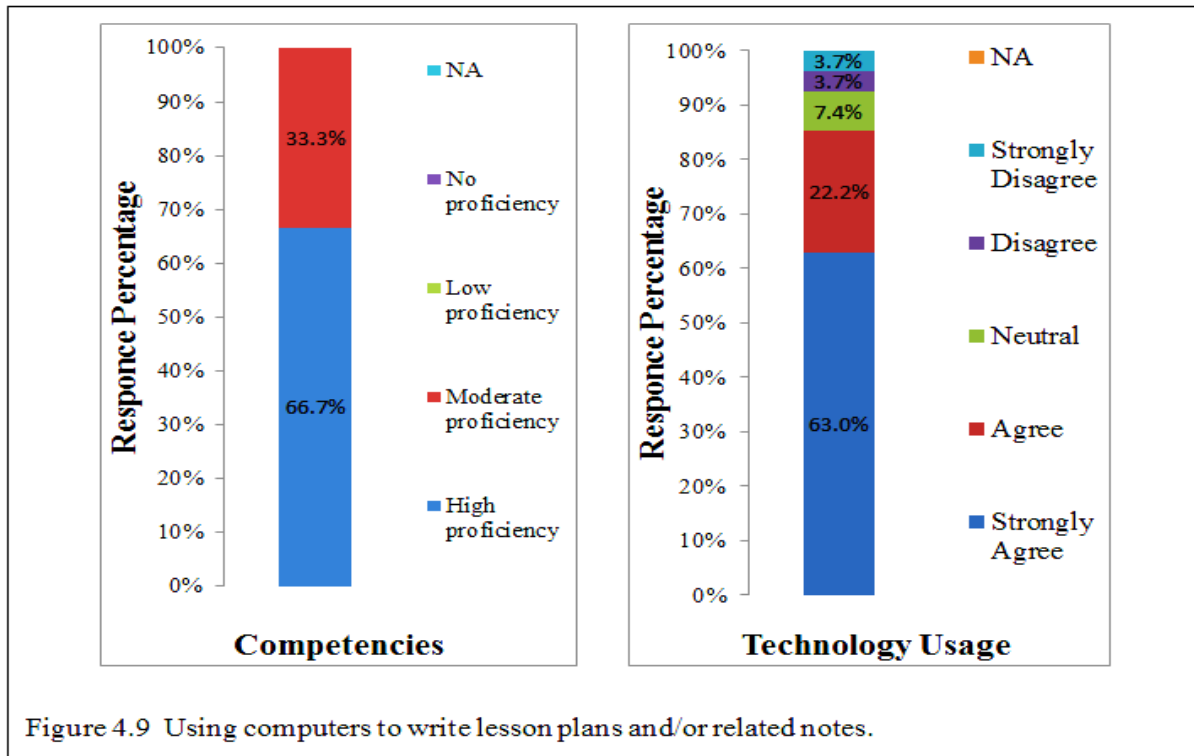
The next question assessed whether parents perceive using computers by students as a waste of time. The majority of elementary teachers (66.7%) confirmed that parents believe in the importance of using computers in education while only 11.1% disagreed. Upon analysing the results, the focus group participants inferred that the school does not have a problem with this factor and that the majority of parents feel the importance of using computers to cope

with the dynamic changes worldwide and to become up-to-date in the current globally challenging environment.

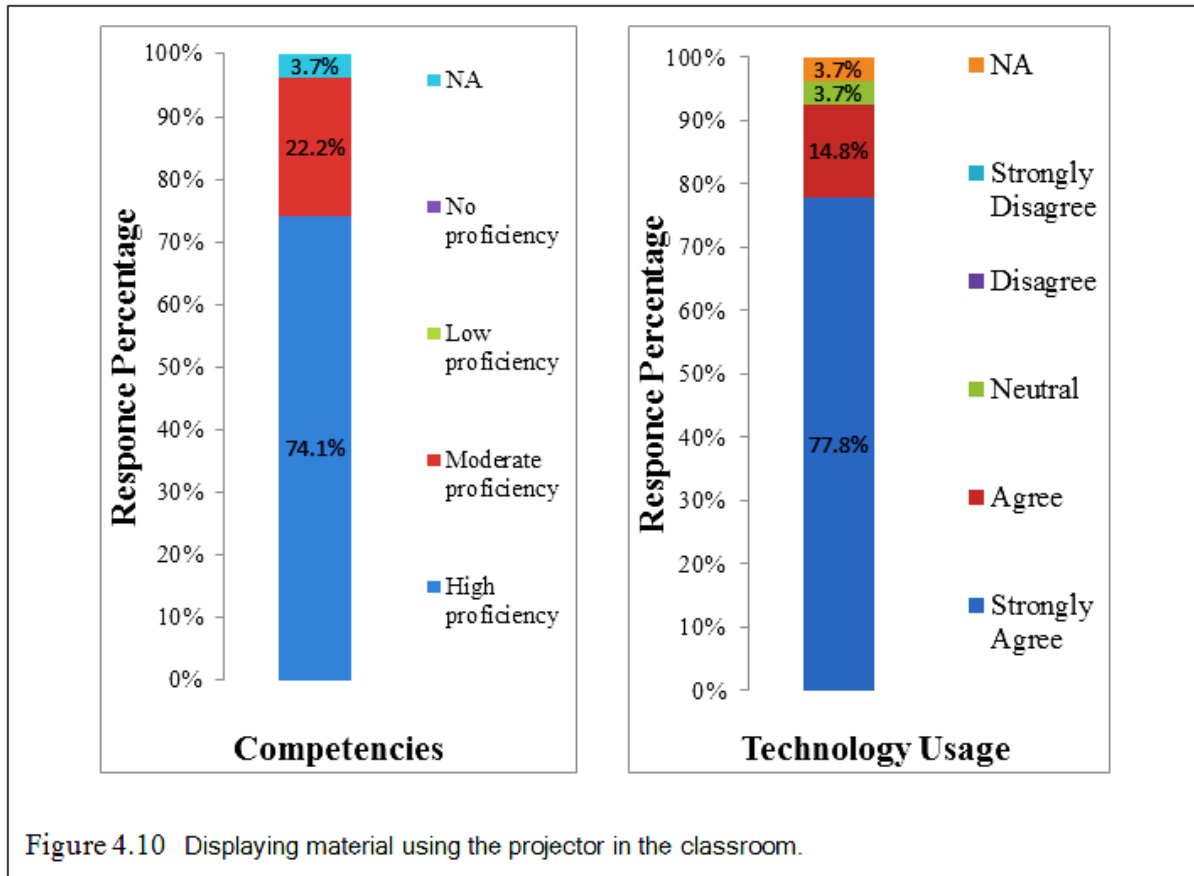
4.5 Competencies

The fifth research question was related to measuring whether school X teachers possessed the required competencies to successfully integrate ICT into education. The following section will analyze the results of two main parts in the survey: 1) teacher's proficiency level in a set of specific technological skills and tools; and 2) teacher's usage level in the classroom for the same set of skills and tools. This is done in an effort to identify and understand gaps between perceived competencies of using technologies and actual uses of these tools and applications so that the focus group can propose recommendations to address this gap.

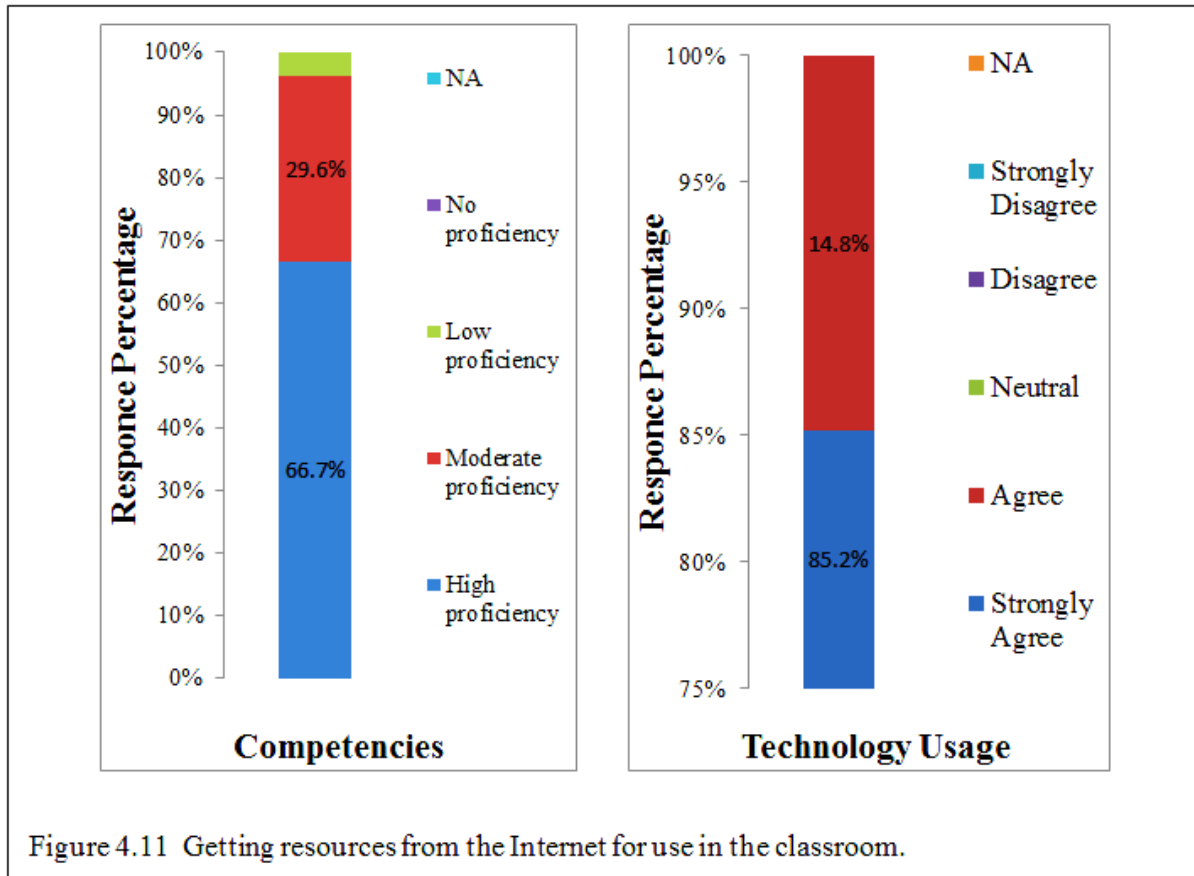
One of the main job requirements of teachers is writing lesson plans (see Figure 4.9); hence teachers showed the highest proficiency level in this area, where 66.7% showed high proficiency and 33.3% showed moderate proficiency. This is also reflected in the results of inquiring about regularly using computers to write lesson plans and/or related notes where 63% strongly agreed, 22.2% agreed, 7.4% were neutral, 3.7% disagreed and 3.7% strongly disagreed. The focus group participants agreed that this high proficiency and usage levels were up to the expected level, and, therefore, no change was needed.



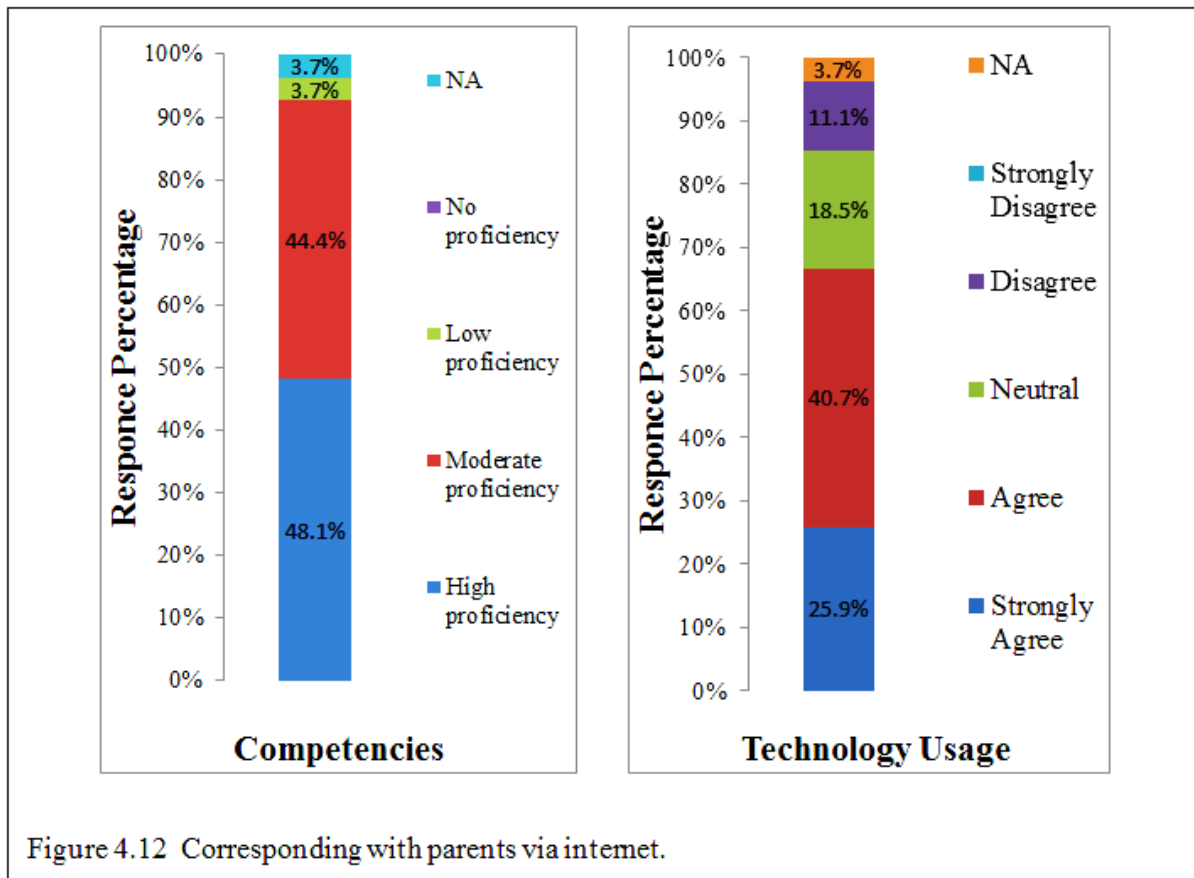
Displaying materials using the projector in the classroom (see Figure 4.10) was one of the questions that received the highest percentage of proficiency level, where 74.1% of respondents showed high proficiency, 22.2% showed moderate proficiency, while 3.7% only responded not applicable. This high proficiency level was reflected in the usage level of this factor, where 77.8% of teachers strongly agreed that they use the projector in the classroom regularly, 14.8% agreed, 3.7% were neutral, and 3.7% responded not applicable. The focus group participants agreed that no changes were required for this factor as it had a high level of both proficiency and usage.



The degree of teachers' proficiency in getting resources from the Internet for use in the classroom (see Figure 4.11) was really high where 66.7% responded that they are highly proficient, 29.6% are moderately proficient, while only 3.7% have low proficiency. Consequently teachers had the highest agreement percentage in all competencies factors examined, where 85.2% strongly agreed, and 14.8% agreed. The focus group participants commented that this area does not have a need for change since technology usage was already 100%.

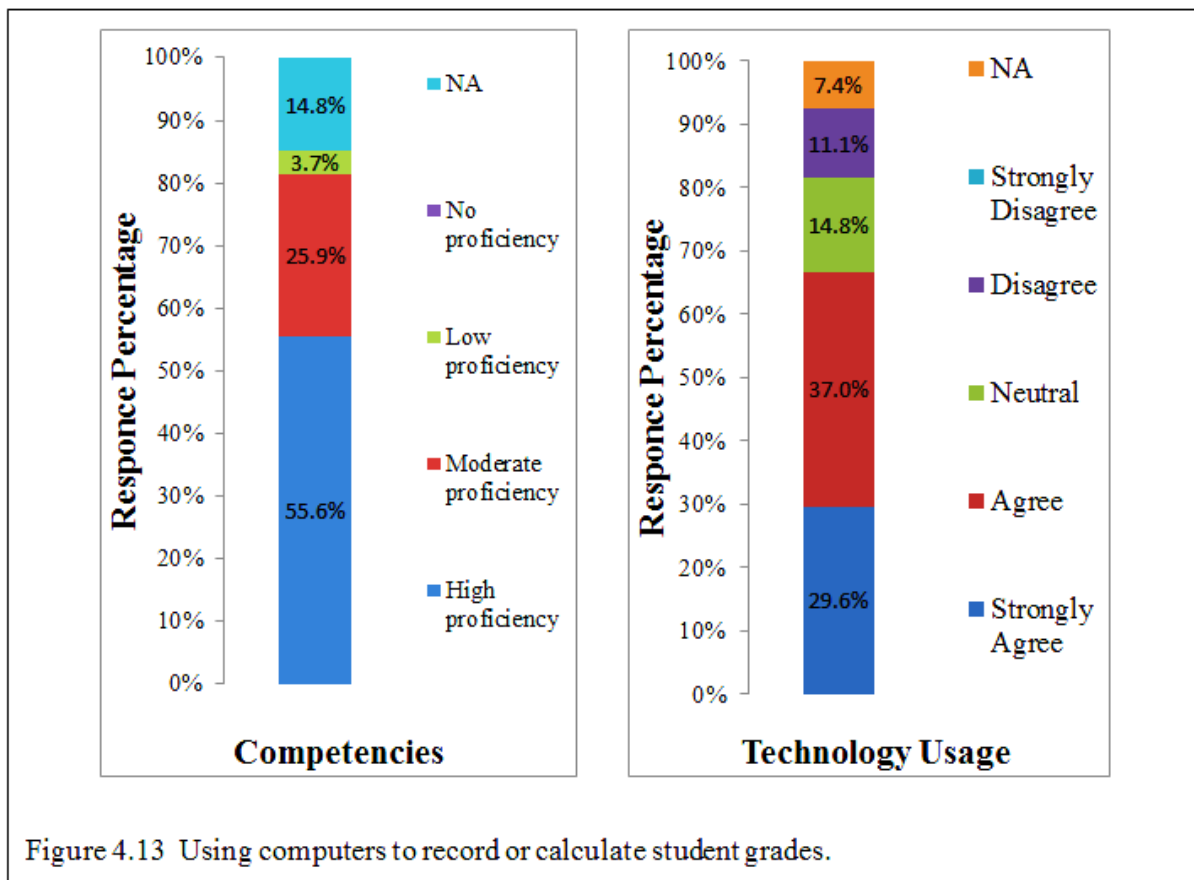


Almost all elementary teachers are proficient in corresponding with parents via the Internet (see Figure 4.12), where 48.1% responded that they have high proficiency, 44.4% have moderate proficiency, only 3.7% have low proficiency and 3.7% responded not applicable. Two thirds of teachers confirmed that they regularly correspond with parents via Internet, where 25.9% strongly agreed, 40.7% agreed, 18.5% were neutral, 11.1% disagreed, and 3.7% responded not applicable. The focus group considered these results as sufficient where teachers are proficient in this area and their usage percentages are high, but they still proposed that communication with parents could be better if each teacher would collect the email addresses of parents of her students at the beginning of the year.



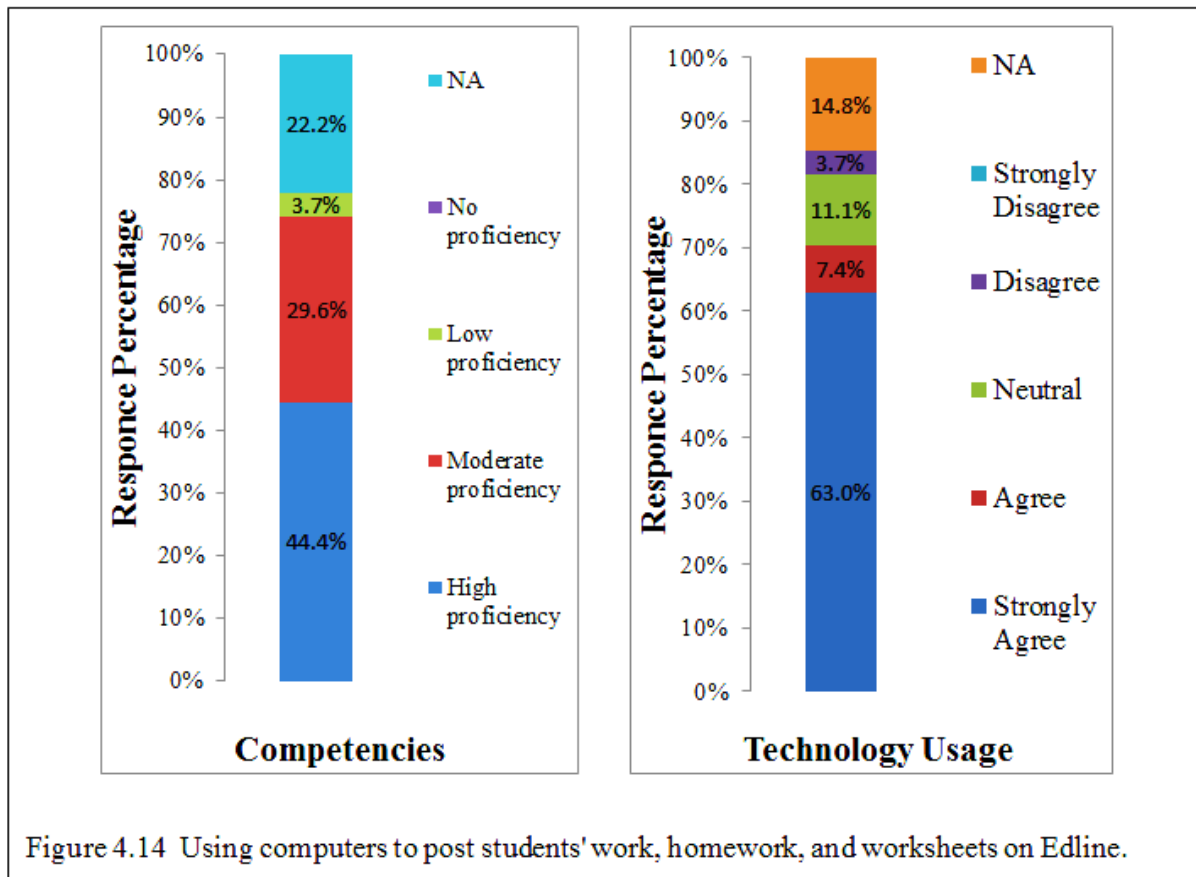
In response to inquiries about teachers' proficiency in recording or calculating students' grades (see Figure 4.13), 55.6% showed high proficiency, 25.9% showed moderate proficiency, 3.7% showed low proficiency and 14.8% responded not applicable. In spite of this high proficiency level of teachers, the results of inquiring about regularly using computers to record or calculate students' grades were relatively low, where 29.6% strongly agreed, 37% agreed, 14.8% were neutral, 11.1% disagreed and 7.4% responded not applicable. The focus group participants pointed out that the teachers in the elementary school are not required to calculate students' grades on the school's grading software; rather they just record the final grade in the system. So if they need to be able to calculate all grades' breakdown (like tests, quizzes, and projects) then they need to do the calculations on an Excel sheet. The focus group participants believed that entering grades on a statistical program (like Excel) reduces the time teachers need to spend on grading as it will automatically calculate final grades and reduce human calculation errors too. Subsequently,

the group recommended that the school should provide teachers with training sessions on using Excel, to increase the usage level of ICT in recording and calculating students' grades.



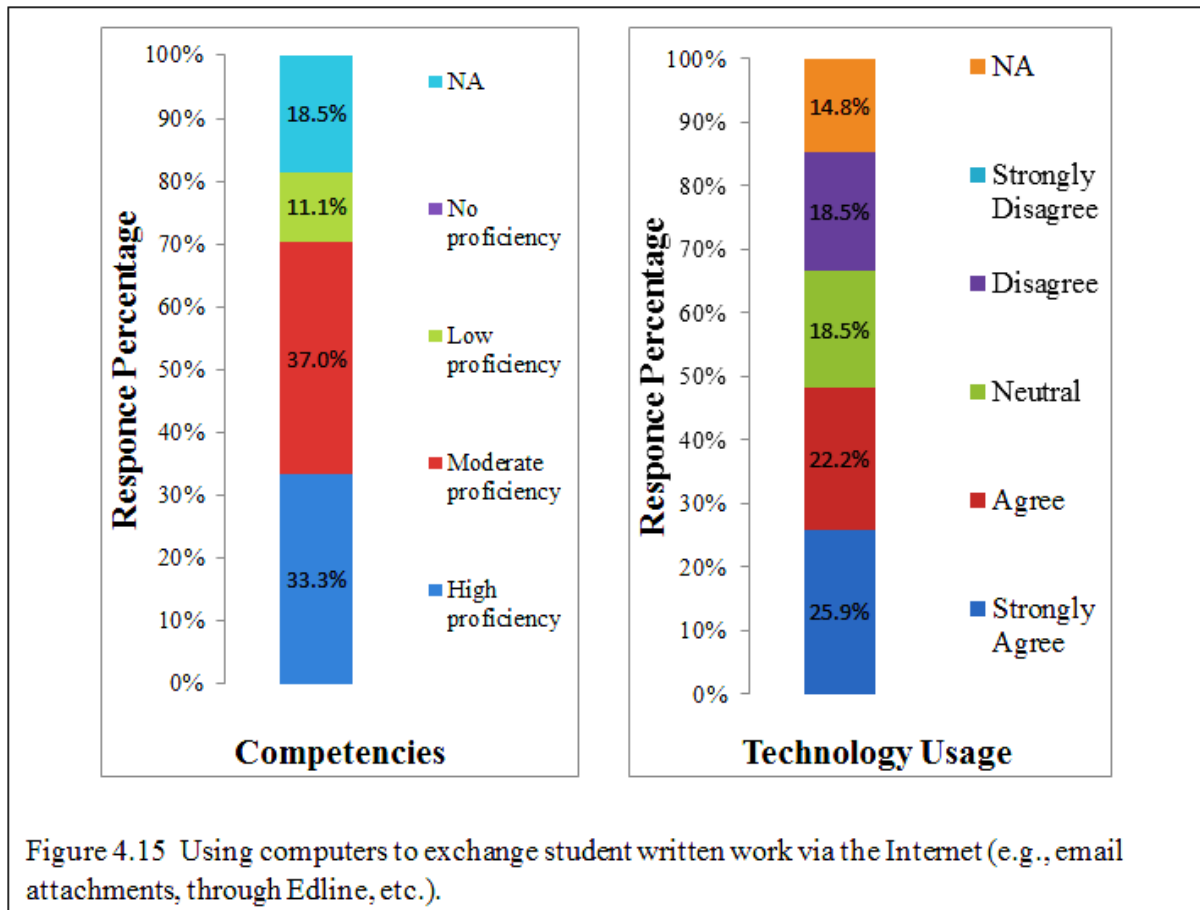
Teachers are expected to post students' work, homework, and worksheets on Edline (see Figure 4.14). Accordingly, they have been given multiple training sessions and support by the school. This was reflected in the relatively high proficiency level of elementary teachers where 44.4% showed high proficiency, 29.6% showed moderate proficiency, only 3.7% showed low proficiency, and 18.5% responded not applicable. The usage level of posting students' work, homework, and worksheets on Edline was also relatively high where 63% strongly agreed, 7.4% agreed, 11.1% were neutral, 3.7% disagreed and 14.8% responded not applicable. In their discussion, focus group participants shared that all elementary teachers were using Edline to post homework at the beginning of the year, until some parents complained several times that they were more comfortable using the channel books for recording homework as they often face Internet or printing issues. In response to

parents' pressure, the elementary principal asked teachers to return to using both the channel book and Edline, which made some teachers reduce their use of Edline. The focus group recommended that the school needs to be firm in enforcing the policy of using Edline by teachers as well as parents so that the school would continue progressing rather than going a step back in this area of development.



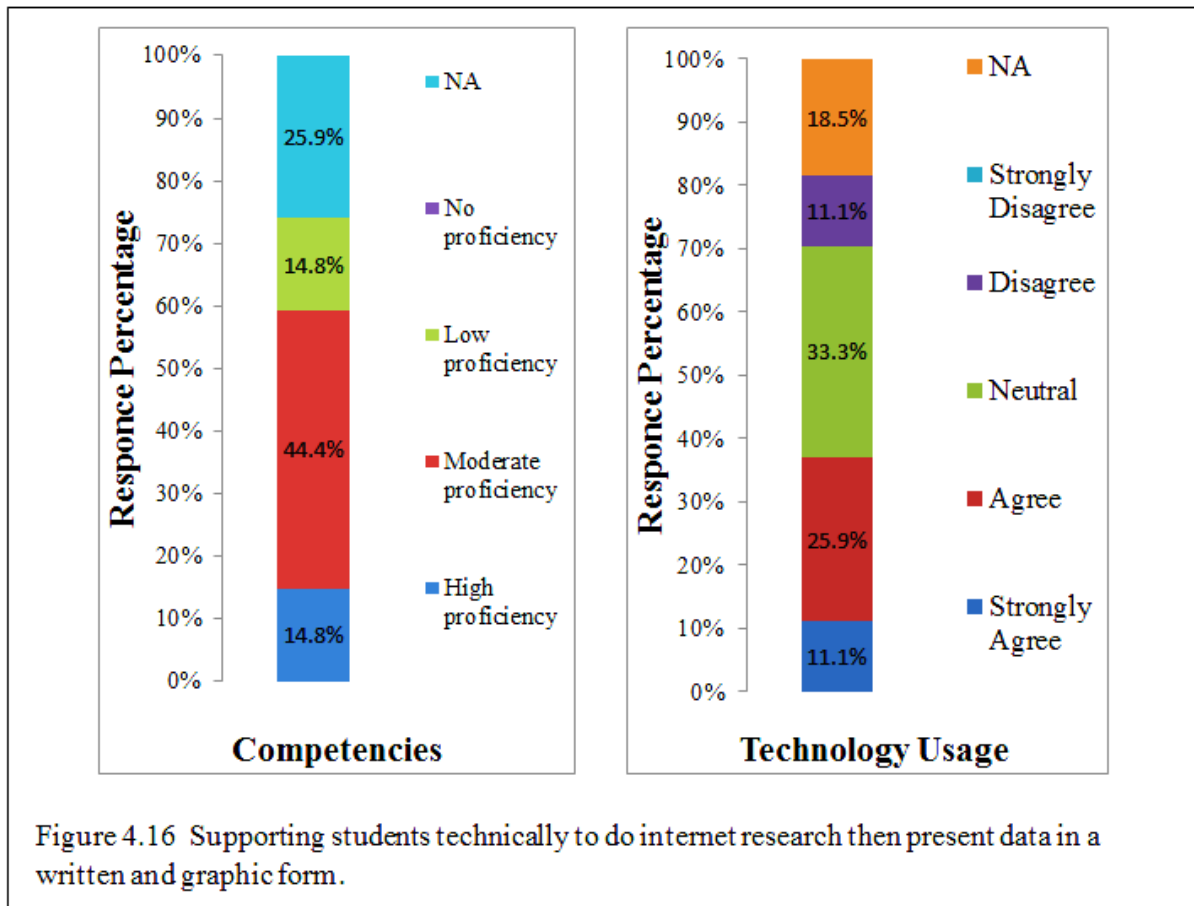
Teachers' proficiency level in exchanging students' written work via the Internet (see Figure 4.15) was relatively high where 33.3% showed high proficiency, 37% showed moderate proficiency, only 11.1% showed low proficiency, and 18.5% responded not applicable. While the usage level of this factor was almost equally distributed where 25.9% strongly agreed that they regularly use computers to exchange students' written work via the Internet, 22.2% agreed, 18.5% were neutral, 18.5% disagreed and 14.8% responded not applicable. The focus group participants argued that the usage level of this factor is relatively low; they related this to problems faced by students in accessing their email accounts or their

lack of knowledge in using them (e.g. attaching documents). Focus group participants recommended that ICT teachers should give students more intensive training and support in accessing and using their email accounts.



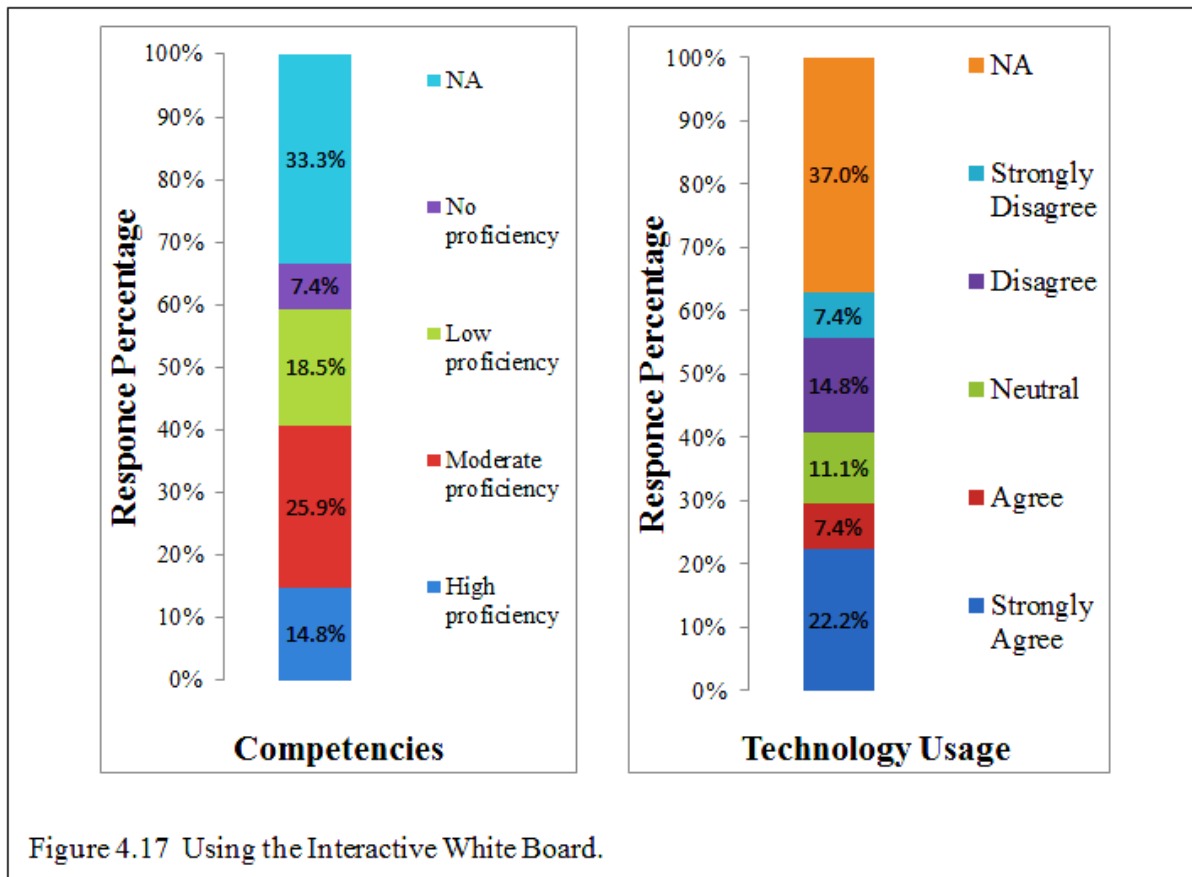
Results showed high proficiency level of 14.8% and moderate proficiency level of 44.4% in teachers' ability to support students technically to do Internet research and then present data in a written and graphic form (see Figure 4.16), while only 14.8% showed low proficiency and 25.9% replied "not applicable". On the other hand, 11.1% strongly agreed that they regularly ask students to do Internet research, 25.9% agreed, 33.3% were neutral, 11.1% disagreed and 18.5% replied "not applicable". The focus group pointed out that these results imply that the majority of teachers are relatively proficient in this area yet they do not regularly use it in the classroom which might be due to one or more condition factors that required change (referred to earlier in section 4.3) like lack of time and instructional support.

The focus group suggested that ICT standards in each grade level should be conveyed to the teachers to know about the technical skills acquired by students because teachers are often concerned about giving students a project they do not have the required skills to perform.



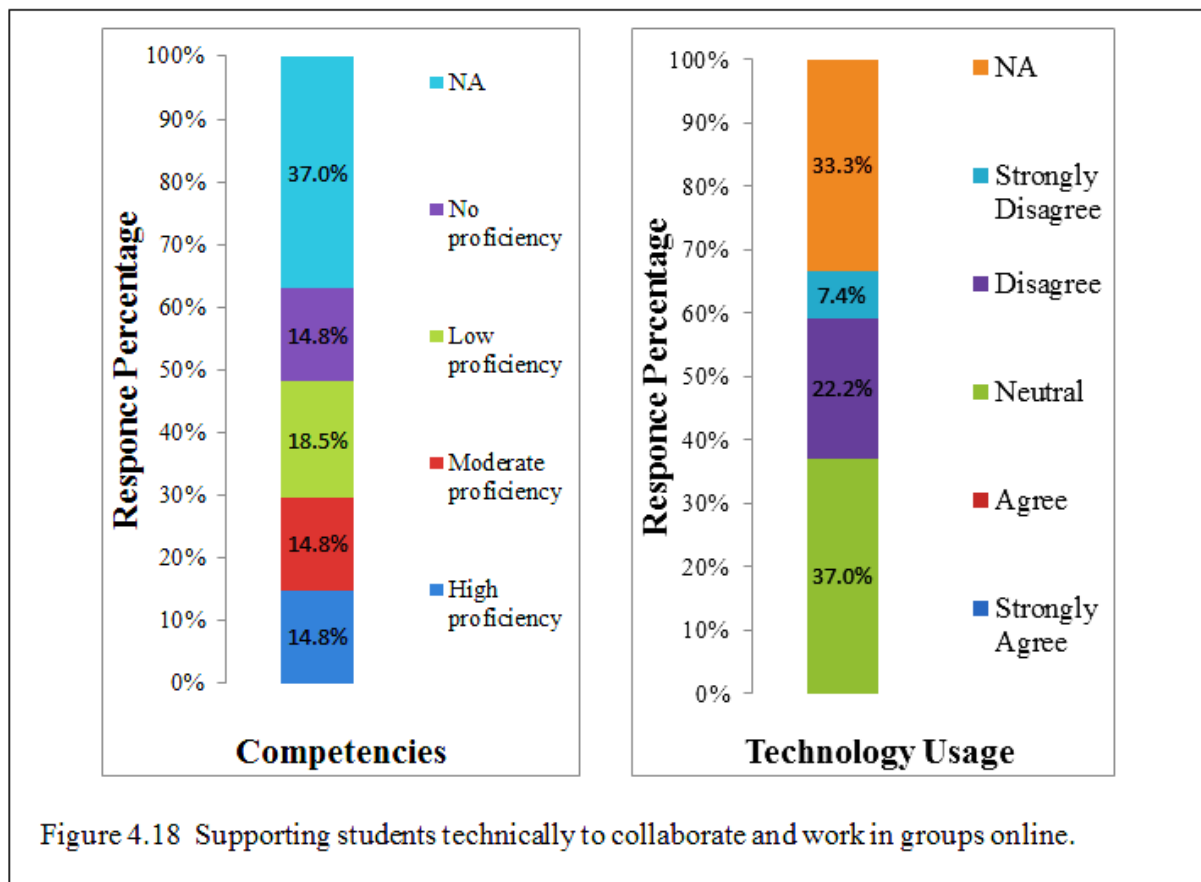
Teachers' proficiency level in using the interactive white board (see Figure 4.17) varied as follows; 14.8% of the respondents had high proficiency, 25.9% had moderate proficiency, 18.5% had low proficiency, 7.4% had no proficiency and 33.3% replied as not applicable which is not an alerting percentage as it implies that they do not have an interactive white board installed in their classroom yet. When analysing teachers' regular use of the interactive white board, 22.2% strongly agreed that they regularly use it, 7.4% agreed, 11.1% were neutral, 14.8% disagreed, 7.4% strongly disagreed and 37% replied "not applicable". In that instance the relatively low usage level of interactive white boards was explained by the percentage of low and no proficiency levels in knowing how to use it.

Consequently, the focus group recommended that as the school policy is to use the interactive white boards as a tool to enhance students' learning, then teachers' proficiency level in using them needs to be improved by providing teachers with adequate training and support especially since approximately 16 new interactive white boards will be installed in different elementary classrooms for the next academic year.



It was evident from responses that elementary teachers had the lowest proficiency levels in supporting students technically to collaborate and work in groups online (see Figure 4.18), where 14.8% of the respondents had high proficiency, 14.8% had moderate proficiency, 18.5% had low proficiency, 14.8% had no proficiency and 37% replied as not applicable. Accordingly, it was the only question that had 0% for both strongly agree and agree i.e. all teachers confirmed that they were not offering students opportunities to work collaboratively in groups online. Teachers' responses varied between 37% neutral, 22.2% disagreed, 7.4% strongly agreed and 33.3% replied "not applicable". Teachers' responses

revealed that most teachers were not competent in this area and that even the few teachers that believed they are highly and moderately proficient in it were still not using it in the classroom. Based on this data, all focus group members agreed that the school should offer training to teachers about new online technology tools that can be used in the classroom (e.g. Web 2.0 tools), this training should not only be about how to technically use the tool, rather how to effectively use it to promote students collaborative work online.



Chapter Five – Conclusions, Recommendations, Limitations, and Further Research

This research study was designed to analyze the factors that encourage or hinder elementary teachers in school X to integrate ICT in education. The main outcome of the study was to develop recommendations for a plan of action to enhance the ICT integration situation in school X. Research in this study followed both quantitative and qualitative research methods to collect a pool of data that was used to reach conclusions and draw recommendations based on the research findings. Factors identified had been categorized into four main domains; culture, conditions, context and competencies, where each domain was analysed in depth to study the way it contributes to the success or failure of the ICT integration process.

One of the main conclusions in this study is that almost all elementary teachers in school X believe in the importance of ICT integration in the teaching and learning process, which implies that deficiencies in their ICT integration trends will not be related to teachers' perception, rather they will be caused by one or more of the factors identified in the four domains. All of the factors studied in this research showed a direct or indirect influence on a specific segment of the teachers' ICT integration process.

5.1 Conclusions

5.1.a Culture. It is evident that school X culture is moderately supportive to teachers' and parents' active engagement and collaboration for continuous improvement, but the main concern is in students' active engagement and collaboration. The school culture should be motivating all students to achieve high academic standards. While elementary teachers do have a voice in much of how things are run within the school, sometimes, that voice is not accounted for where the policies come out with no reference to the recommendations that the

teachers made. Also sometimes teachers' voice is asked for at a late stage in the decision-making effort when opportunities of real change are limited.

5.1.a.i Teachers. Survey results showed that teachers are highly encouraged to share new ideas and suggestions to develop the curriculum, teaching strategies, behaviour management systems or any other areas related to the teaching and learning process; moreover they were given the tools to try those ideas out. Elementary teachers are also given the chance to work together to develop a school wide set of goals such as setting academic goals for students based on reports from standardized tests and setting behavioural goals to improve the students' behaviour management system applied in the elementary school.

Although teachers are offered a significant number of hours for participation in continuous professional development sessions, they feel that some of these development sessions are imposed on them, their topics are not in the areas they need or their quality is not up to their expectations. A similar trend is noticeable in the extent and quality of teachers' involvement in making important decisions, where despite the fact that the school in many occasions involves teachers in decision making, this involvement is sometimes at a late stage where feedback and change becomes difficult.

It is noticeable that staff members generally put the needs of students first, but in some cases it is disregarded like a teacher's failure to use differentiated instruction in class to accommodate students' different learning styles.

5.1.a.ii Parents. Parents in the elementary school are encouraged to get involved in their children's school experience. Communication channels are always open between the school and home and the Parents Teachers Association (PTA) has an active role in the school. It is also evident that parents respect what teachers do and are confident that teachers will always act towards the best interest of their children.

5.1.a.iii Students. Students seemed to have varying levels of active engagement and collaboration in the school where teachers feel that about half of their students do not work hard enough to achieve high academic standards. This is a major concern about school X's culture is encouraging students to be high achievers and to enjoy the learning process.

5.1.b Conditions. The twelve factors studied in the school conditions showed high significance to the ICT integration process in school X where patterns were easily identified in the results which indicate whether each factor contributes negatively or positively to teachers' efforts to integrate ICT.

5.1.b.i Factors with positive influence. A set of six condition factors appear to positively influence the ICT integration process which are: a) the ease of using the available technology in school; b) the reliability of the available technological equipment; c) the school existing policy for ICT integration in teaching and learning; d) the freedom of teachers to make decisions regarding ICT integration; e) the adequate technical support teachers get when integrating ICT; and f) the ease of scheduling the use of a computer lab.

The available technology in school X like Edline, data show and grading software are easy to use, and the available technological equipment are reliable where Internet connections are stable, computers are regularly maintained, and IT support team is readily available for any required support. The school has an existing policy for ICT integration in teaching and learning and teachers have the freedom to make decisions regarding ICT integration where the school leaders always welcome teachers' efforts and ideas in integrating ICT. Leadership support facilitates and speeds-up the integration process in the educational institution as a whole (Tondeur et al., 2008). Teachers receive adequate technical support when integrating ICT where they can easily contact an IT staff member to immediately resolve a technical problem the teacher is facing. As emphasized by Buabeng-Andoh (2012) teachers will tend to

refrain from using the technology in the targeted manner if they are not confident that whenever they face a hardware, software or infrastructure problem somebody will quickly be available to fix it without wasting the class or teacher time. Moreover it is ease to schedule the use of a computer lab where teachers can sign up in a reservation sheet available at the lab door.

5.1.b.ii Factors with negative influence. The other six factors form challenging conditions that contribute greatly to reducing the teachers' willingness to integrate ICT. The six factors are: a) not having access to adequate software resources to use with students; b) not having enough time to plan for lessons integrating ICT; c) not receiving adequate training in ICT integration; d) not receiving help in supervising students when reserving the computer lab; e) not receiving adequate instructional/pedagogical support when integrating ICT in teaching; and f) teachers are not regularly evaluated on integrating ICT in education.

Teachers in school X do not have access to adequate software resources to use with students where they lack the knowledge about available resources in the school and they are not provided enough time to plan for lessons integrating ICT due to some teachers' high work load. One of the 26 computer coordinators involved in a study conducted at high schools in Sydney affirmed that teachers' workload can threaten ICT integration efforts by teachers stating that: "Asking them to take on board yet another task in an already overcrowded curriculum and extremely busy work day is pushing many teachers to the limit and in some cases beyond" (Neyland, 2011, p. 162). Teachers also do not receiving adequate training in ICT integration which makes them feel that they are not competent enough to effectively integrate ICT. Similarly Mueller et al. (2008) proved in a research study of 400 pre-tertiary teachers that the degree of effectiveness of ICT integration highly depends on professional development. Teachers do not receive enough help in supervising students when reserving the computer lab, so they often refrain from reserving the computer lab as they fear to lose

control of the class if a technical problem which they are not capable of solving occurred while they are in the lab on their own with the students. Moreover teachers do not receive adequate instructional/pedagogical support when integrating ICT in teaching, consequently teachers do not have enough knowledge about the available technological tools they can use in instruction and do not know about ways to integrate those tools in their lesson plans in an effective pedagogically sound fashion. Plair (2008) also ensured that teachers need to have access to a skilful technology curriculum specialist who would discuss methods, tools, and techniques with the teachers to help them integrate ICT effectively to enhance students' learning. Furthermore, teachers are not regularly evaluated on integrating ICT in education which gives them the impression that they are not required to integrate ICT in their teaching.

5.1.c Context. The Four context factors were tested through this research to determine whether they hinder or support teachers' efforts to integrate ICT in their teaching. Results showed that only one of these factors is considered a point of strength that facilitates the ICT integration process. Participants in this research believe that parents do not perceive students' use of computers as a waste of time, rather they believe in the importance of using computers to cope with the dynamic changes worldwide and to become up-to-date in the current globally challenging environment.

On the other hand, the three other factors contribute to reducing the effectiveness of the ICT integration process. According to participating teachers, parents, in spite of their awareness of computers' importance, are more concerned with students' grades than with technology integration. This is a part of the Egyptian parents' cultural perception of academic excellence which considers grades as the main indicator of current and future success within the educational system. In the same context, teachers' concern about the students' performance in standardized assessments, ministry of education exams, local tests and quizzes challenges them to spend a considerable amount of time in preparing students for

these exams. This results in reducing the time available in the curriculum to integrate ICT. The third factor is the lack of students' access to the needed technology outside of the classroom which is due to the priority given to elder siblings in using the technology available at home, instability of Internet access, or lack of essential computer accessories like printers.

5.1.d Competencies and Technology Usage. Some of the culture, conditions, and context factors discussed earlier have contributed to developing the teachers' competence level in some areas like the availability of easy-to-use technology in the school and the reliability of the technological equipment. There is a strong relationship between the levels of teachers' competency and their use of a specific technological skill or tool where the usage level increases with the increase of teachers' proficiency level and vice versa. Peralta and Costa (2007) proved the same in a qualitative multiple case study of 20 teachers from five European countries (Greece, Italy, Portugal, Spain and The Netherlands), where one of their conclusions was that teachers that have more experience in using computers get more confidence in their capability to use it effectively in education.

There are three competence factors that showed high proficiency level and consequently high technology usage level in classroom; a) regularly using computers to write lesson plans and/or related notes, b) regularly displaying material using the projector in the classroom, and c) regularly using computers to get resources from the Internet for use in classroom.

The three competence factors; a) regularly using computers to record or calculate students' grades, b) regularly corresponding with parents via Internet, and c) regularly using computers to post students' work, homework, and worksheets on Edline showed high proficiency levels and adequate usage levels.

While regularly using computers to exchange students' written work via the Internet and regularly asking students to do Internet then presenting data in a written and graphic form showed adequate proficiency levels and low usage levels.

Two competence factors showed low proficiency levels and accordingly low usage levels; a) regularly using the interactive white board, b) regularly offering opportunities for students to work collaboratively in groups online.

5.2 Recommendations

This section will display recommendations for the plan of action identified by the focus group participants to increase effective ICT integration in education of school X. This plan should help the school to change its current ICT integration situation to the desired situation that would enhance the teaching and learning process.

5.2.a Culture. Focus group participants recommended the following to enhance school X culture to support teachers' active engagement and collaboration for continuous improvement.

- 1) Teachers should take part in formulating school policies and decisions to feel more ownership and responsibility towards applying them.
- 2) The school should revisit its goals to increase teachers' input in them.
- 3) Teachers and administrators should be continuously reminded of the school mission and vision in all staff meetings to ensure that all staff members are putting students' needs first.
- 4) Professional development workshops for teachers should be chosen by teachers.
- 5) Workshops should be offered to parents to increase their involvement level in students' learning process.

- 6) Teachers should set high academic expectations for students through showing them samples of the expected work to increase their obligation towards academic excellence.

5.2.b Conditions. The following recommendations were made by the focus group participants to improve the school conditions that support ICT integration for the improvement of teaching and learning.

- 1) The school should have a clear written ICT integration policy.
- 2) The school needs to be firm in enforcing the policy of using technological applications that facilitate communication with parents (e.g., Edline). That enforcement should apply to both teachers and parents.
- 3) The school policy regarding offering teachers support while reserving the computer lab needs to be clear for classroom and ICT teachers.
- 4) The school should hire an ICT specialist to be responsible for supporting teachers and giving them the required knowledge and skills in ICT integration.
- 5) Regular evaluations for ICT integration should take place after working on other school conditions that raised concerns.
- 6) Teachers' schedules should have adequate time allotted for planning lessons integrating ICT
- 7) The school administration should develop a database of all multimedia resources available in school and make it simple and easily accessible for teachers.
- 8) All computers in classrooms should be renovated and at least two students' computers should be available in addition to the teacher computer.
- 9) Printers should be available in each grade level centre rather than in the workrooms for ease of accessibility.

5.2.c Context. The focus group participants had only one recommendation regarding the external factors which shape the context within which school X takes its decisions to integrate ICT. The school should inform parents at the beginning of the year with all technology requirements students would need to have access to at home so they can accomplish the required work like research and science fair projects.

5.2.d Competencies. Focus group participants recommended the following to enhance teachers' competencies to successfully integrate ICT in education.

- 1) Training sessions should be offered throughout the year, rather than only at the beginning of the year. Monthly training opportunities were suggested.
- 2) Training sessions should be offered at varying instructional levels i.e. beginner, intermediate and advanced to allow teachers with different ICT skills to increase their competence level in using this technology.
- 3) Tuesday after school training sessions should be better planned to ensure their quality since they are the most frequent ones teachers receive.
- 4) Professional development sessions should provide teachers with knowledge in areas they really need.
- 5) Some areas of suggested training are: a) Excel to record and calculate students' grades; b) ways to integrate educational technology into teaching ; c) new online technology tools that can be used in the classroom; d) the interactive white board.
- 6) ICT standards in each grade level should be conveyed to the teachers so that they know about the technical skills required by students. This will encourage teachers to develop the competencies needed.

5.3 Limitations of the Study

One of the biggest limitations of this study was the fact that the survey was administered online; although it made data collection and analysis easier but it might have contributed in the relatively low response rate of 57.4% of the elementary teachers. The second limitation to the study is the absence of Arabic studies teachers in the focus group due to scheduling reasons. Also the fact that this research was carried in the elementary school of one international school in Egypt represents a limitation to the study where it does not make the case and findings generalizable to other international schools in Egypt.

5.4 Further Research

This study opened a number of venues for further research both within the school under study and on a wider scale to include different schools in Egypt.

The scope of this research was only the elementary level; further research should be conducted to expand the scale of the study to include all levels in the school; early childhood, elementary, middle school, and high school. This will give a broader and more accurate view of the ICT integration situation within the whole school where differences in integration trends will be apparent between the different levels, more teachers' opinions and experiences will be considered, and the recommended plan of action will be inclusive enough to reflect all students', teachers' and parents' technological needs. Also, further research in the school should consider more involvement of the Arabic studies teachers in the focus group. Due to the nature of the subjects they teach, they might have specific technological needs for their departments that should not be overlooked. Another area to be considered for further research is the inclusion of students as participants in the research where they are the main stakeholders in the educational process, hence their opinions are essential.

The research studied the ICT integration situation in one international school in Egypt. Further research should be undertaken in multiple national, public, and international

schools to be able to study the general ICT integration situation of schools in Egypt and to compare the effect of variations in culture, condition, context and competence factors on the ICT integration situation within each of these schooling systems. Conducting such a research will be considered a very important milestone in the country's reform process where all nations' development starts with upgrading the educational level of its youth.

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Appendix

Appendix 1: Online Survey Consent Form – English Version



Documentation of Informed Consent for Participation in Research Study

Project Title: *Factors Affecting Elementary Teachers' Decision to Integrate Information and Communication Technologies (ICT) in Education*

Principal Investigator: *Shaimaa Mohamed Mohamed Hafez*

*You are being asked to participate in a research study. The purpose of the research is *to identify the factors that affect your decision to integrate ICT in your teaching to come up with a whole school plan of action that would help in increasing the effectiveness of ICT integration in the teaching and learning processes*. The findings may be *published and presented*. The expected duration of your participation is *10 to 15 minutes to fill out the online survey*.

*There *will not be* certain risks or discomforts associated with this research. *I assure you that all your responses will remain confidential*.

*There *will be* benefits to you from this research *as your contribution in this study may help shape the future of ICT integration at our school hence increase the effectiveness of the teaching and learning processes*.

*The information you provide for purposes of this research *is confidential where your identity (name, initials, or any other identifying factors) will not be revealed. All information contributed during this session will be reported in an aggregate form*.

In case you have any pertinent questions about the research, your rights, or whom to contact in the event of a research-related injury to you, you need to contact Shaimaa Hafez at 01001955862.

*Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or the loss of benefits to which you are otherwise entitled.

If you agree to participate in this study, please click the "Continue" button.

If you do NOT agree to participate in this study, please click the "Exit" button.

Appendix 2: Online Survey– English Version

Please supply the following information regarding your experiences and background:

1. Gender:

Male

Female

2. Age:

20 to 30

31 to 40

41 to 50

51 to 60

above 60

3. Teaching Experience:

Drop down menu from 0 to above 25 years

4. Number of years working in the school:

Drop down menu from 1 to 10 years

5. Subject(s) I Teach (Check all that apply):

Arabic

Character Ed

Drama

English/Language Arts

English as Second Language
(ESL)

Fine Arts

French

ICT

Library Studies

Mathematics

Music

Religion

Science

Special Education Needs
(SEN)

Social Studies

6. Grades I Teach (Check all that apply):

PS

Pre K

K

G1

G2

G3

G4

G5

G6

G7

G8

G9

G10

G11

G12

7. BA Major (e.g. Commerce, Education, English Literature, Chemistry):

8. BA University: (e.g., Cairo University, Al Azhar University, German University in Cairo): _____

9. Highest Educational Degree Attained:

___ Bachelors

___ Masters

___ Doctorate

___ Other

Please specify:

10. The stage that best describes where I am within the technology adoption and integration into teaching and learning process is:

___ I am aware of technology and have some basic skills but do not think I have sufficient expertise to use technology without assistance. I rarely require the use of technology by students to complete assignments.

___ I can use basic software and some standard hardware comfortably. I occasionally require students to use basic technology resources to complete assignments.

___ I use a variety of technology resources/tools in my preparation, instructional delivery, and evaluation. I often require students to use a variety of technology resources/tools in the construction of curriculum-based products.

___ I am eager to share my teaching with technology experiences with my colleagues, and I encourage student/faculty interactions in discovering and utilizing different technologies beneficial to learning.

11. Please indicate your level of agreement with each of the following statements:

	Culture	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	NA
A	Teachers in this school are involved in making important decisions.						
B	Teachers with new ideas are encouraged.						
C	Teachers work together to develop a school wide set of goals.						
D	All Staff members put the needs of students first.						
E	Staff members participate in continuous professional development sessions.						
F	Parents are involved in their children's school experience.						

G	Parents respect what teachers do.						
H	Students work hard to achieve high academic standards.						
	Conditions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	NA
I	The school has an existing policy for ICT integration in teaching and learning.						
J	I received adequate training in ICT integration at school.						
K	School administration regularly evaluates staff members on integrating ICT in education.						
L	The school provides teachers with adequate time to plan for lessons integrating ICT.						
M	I receive adequate technical support when integrating ICT in my teaching.						
N	I receive adequate instructional/pedagogical support on ways to integrate ICT in my teaching.						
O	I have the freedom to make decisions regarding ICT integration.						
P	It is easy for me to schedule the use of a technology-equipped classroom (e.g., computer lab).						
Q	I receive help in supervising students when reserving the computer lab.						
R	I have access to adequate software resources to use with my students (e.g., licensed copies of educational software).						
S	The technological equipment available to me at school is reliable.						
T	The available technology in school is easy-to-use (e.g. Edline, Interactive WhiteBoards).						
	Context	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	NA
U	Parents perceive using computers by students as a waste of time.						
V	Parents are more concerned with student grades than technology integration.						
W	Students don't have access to needed technology outside of the classroom.						
X	Focus on exams reduces the time available in the curriculum to integrate ICT.						

12. Select the level of proficiency that best describes your knowledge and skills to use the following:

	Competencies	High proficiency	Moderate proficiency	Low proficiency	No proficiency	NA
A	Record or calculate student grades.					
B	Write lesson plans and/or related notes.					
C	Get resources from the Internet for use in the classroom.					
D	Post students' work, homework, and worksheets on Edline.					
E	Exchange student written work via the Internet (e.g., email attachments, through Edline, etc.).					
F	Display material using the projector in the classroom.					
G	Correspond with parents via Internet.					
H	Support students to do Internet research then present data in a written and graphic form.					
I	Support students to collaborate and work in groups online.					
J	Use the Interactive WhiteBoard.					

13. Please indicate your level of agreement with each of the following statements:

	Technology Usage	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	NA
A	The integration of technology into instruction is important for student learning.						
	I regularly use computers to:						
B	Record or calculate student grades.						
C	Write lesson plans and/or related notes.						
D	Get resources from the Internet for use in the classroom.						
E	Post students' work, homework, and worksheets on Edline.						
F	Exchange student written work via the Internet (e.g., email attachments, through Edline, etc.).						
G	Display material using the projector in the classroom.						

H	Ask students to do Internet research then present data in a written and graphic form.						
I	Offer opportunities for students to work collaboratively in groups online.						
J	Correspond with parents via Internet.						
K	Support students to do Internet research then present data in a written and graphic form.						
L	Support students to collaborate and work in groups online.						
M	Use the Interactive WhiteBoard.						

Appendix 3: Online Survey Consent Form – Arabic Version

الجامعة الأمريكية بالقاهرة



استمارة موافقة مسبقة للمشاركة في دراسة بحثية

عنوان البحث : العوامل المؤثرة على قرار معلمين المرحلة الابتدائية لدمج تكنولوجيا المعلومات والاتصالات في التعليم

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الهاتف: ٠١٠٠١٩٥٥٨٦٢

انت مدعو للمشاركة في دراسة بحثية عن دمج تكنولوجيا المعلومات والاتصالات في التعليم.

هدف الدراسة هو تحديد العوامل التي تؤثر على قرار المدرسين لدمج تكنولوجيا المعلومات والاتصالات في التعليم من أجل التوصل إلى خطة عمل للمدرسة كلها من شأنها أن تساعد في زيادة فعالية إدماج تكنولوجيا المعلومات والاتصالات في عمليات التعليم والتعلم.

نتائج البحث ستنتشر في دوريه متخصصه أو مؤتمر علمي أو ربما كليهما.

المدة المتوقعة للمشاركة في هذا البحث من ١٠ إلى ١٥ دقيقة لملء استطلاع على الانترنت.

المخاطر المتوقعة من المشاركة في هذه الدراسة: لا توجد اي مخاطر متوقعة وأؤكد لكم أن كافة إجاباتكم ستبقى سرية.

الاستفادة المتوقعة من المشاركة في البحث: مساهمتكم في هذه الدراسة قد تساعد في تشكيل مستقبل دمج تكنولوجيا المعلومات والاتصالات في التعليم في مدرستنا و من ثم تساعد في زيادة فعالية عمليات التعليم والتعلم.

السرية واحترام الخصوصية: المعلومات التي ستدلى بها في هذا البحث سوف تكون سرية حيث لن تكون هويتك معلنة في البحث (الاسم أو الأحرف الأولى من الاسم أو أي عوامل أخرى تحدد شخصيتك). كافة المعلومات التي ستساهمون بها سوف تجمع في تقرير إجمالي.

في حال الرغبة في الحصول على مزيد من المعلومات عن الدراسة أو حقوق المشاركين فيها أو عند حدوث أي اصابات ناتجة عن هذه المشاركة يجب ان توجه الاتصال الى شيماء حافظ علي ٠١٠٠١٩٥٥٨٦٢

ان المشاركة في هذه الدراسة ماهي الا عمل تطوعي، حيث أن الامتناع عن المشاركة لا يتضمن أي عقوبات أو فقدان أي مزايا تحقق لك. ويمكنك أيضا التوقف عن المشاركة في أي وقت من دون عقوبة أو فقدان لهذه المزايا.

إذا كنت توافق على المشاركة في هذه الدراسة، انقر فوق زر "متابعة" رجاءً.
إذا كنت لا توافق على المشاركة في هذه الدراسة، انقر فوق زر "إنهاء" رجاءً.

Appendix 4: Online Survey – Arabic Version

برجاء توفير المعلومات التالية فيما يتعلق بخبراتك وخلفياتك:

١. النوع:

_____ ذكر _____ أنثى

٢. العمر:

_____ ٢٠ حتى ٣٠ _____ ٣١ حتى ٤٠ _____ ٤١ حتى ٥٠ _____ ٥١ حتى ٦٠ _____ أكثر من ٦٠

٣. الخبرة في التدريس:

قائمة منسدلة من ٠ إلى أكثر من ٢٥ عام

٤. عدد سنوات العمل في المدرسة:

قائمة منسدلة من ١ حتى ١٠ أعوام

٥. المواد التي تقوم بتدريسها (برجاء اختيار كل ما ينطبق عليك):

_____ العربية	_____ تربية سلوكية	_____ دراما
_____ الإنجليزية / فنون اللغة	_____ الإنجليزية كلغة ثانية (ESL)	_____ الفنون الجميلة
_____ الفرنسية	_____ تكنولوجيا المعلومات والاتصالات	_____ دراسات المكتبة
_____ الرياضيات	_____ الموسيقى	_____ الدين
_____ العلوم	_____ ذوي الاحتياجات التعليمية الخاصة (SEN)	_____ الدراسات الاجتماعية

٦. المراحل الدراسية التي تقوم بتدريسها (برجاء اختيار كل ما ينطبق عليك):

_____ PS	_____ Pre K	_____ K	_____ G1	_____ G2
_____ G3	_____ G4	_____ G5	_____ G6	_____ G7
_____ G8	_____ G9	_____ G10	_____ G11	_____ G12

٧. بكالوريوس (على سبيل المثال، التجارة، التربية، أدب إنجليزي، الكيمياء ... إلخ): _____

٨. الجامعة: (على سبيل المثال، جامعة القاهرة، جامعة الأزهر، الجامعة الألمانية في القاهرة ... إلخ): _____

٩. أعلى درجة تربوية حصلت عليها:

_____ البكالوريوس _____ الماجستير _____ الدكتوراه _____ أخرى
يرجى التحديد: _____

١٠. المرحلة التي تصف أين أنت من دمج التكنولوجيا في عملية التعليم والتعلم هي:

_____ أنا على علم بالتكنولوجيا ولدي بعض المهارات الأساسية ولكن لا أعتقد أن لدي خبرة كافية في استخدام التكنولوجيا بدون مساعدة. نادراً ما أطلب من الطلاب استخدام التكنولوجيا لإكمال المهام الدراسية.

_____ يمكنني استخدام بعض البرامج الأساسية وبعض الأجهزة التكنولوجية بسهولة. اطلب من طلابي أحياناً أن يستخدموا برامج تكنولوجية أساسية لإكمال المهام الدراسية.

_____ استخدم مجموعة متنوعة من البرامج والأجهزة التكنولوجية في إعداد الدروس، وتوصيل المعلومات، والتقييم. غالباً ما أطلب من طلابي أن يستخدموا مجموعة متنوعة من البرامج والأجهزة التكنولوجية في تخطيط و تنفيذ مشاريعهم الدراسية.

_____ أنا حريصة على مشاركة خبراتي في التدريس باستخدام التكنولوجيا مع زملائي و أشجع تفاعل الطلبة و المعلمين في اكتشاف واستخدام التكنولوجيات المختلفة المفيدة في التعليم.

١١. يرجى الإشارة إلى مدى اتفاقك مع كل من العبارات التالية :

	لا ينطبق	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	
أ							يشارك المعلمين في هذه المدرسة في اتخاذ القرارات الهامة.
ب							يتم تشجيع المعلمين الذين يعرضون أفكار جديدة.
ج							يعمل المعلمين معا لوضع مجموعة من أهداف المدرسة.
د							يضع جميع الموظفين في المدرسة احتياجات الطلاب أولاً.
هـ							يشارك المعلمين في دورات تطوير مهني باستمرار.
و							يشارك أولياء الأمور في تجربة أبنائهم المدرسية.
ز							يحترم أولياء الأمور ما يفعله المعلمين.
ح							يعمل الطلاب بجد لتحقيق معايير أكاديمية عالية.
ط							المدرسة لديها سياسة قائمة لدمج تكنولوجيا المعلومات والاتصالات في التعليم والتعلم.
ي							تلقيت تدريب كافي عن دمج تكنولوجيا المعلومات والاتصالات في المدرسة.
ك							تقوم إدارة المدرسة بعمل تقييم دوري لدمج المعلمين لتكنولوجيا المعلومات والاتصالات في التعليم.
ل							توفر المدرسة الوقت الكافي للمعلمين للتخطيط لدمج تكنولوجيا المعلومات والاتصالات في الدروس.
م							أتلقي دعم تقني كافي عند دمج تكنولوجيا المعلومات والاتصالات في

						التدريس.
						ن أتلقى دعم تعليمي و منهجي كاف على طرق دمج تكنولوجيا المعلومات والاتصالات في التدريس.
						س لدي الحرية في اتخاذ القرارات المتعلقة بدمج تكنولوجيا المعلومات والاتصالات.
						ع من السهل حجز/جدولة استخدام فصل مجهزاً تجهيزاً تكنولوجياً (مثل مختبر الحاسب الآلي).
						ف أتلقى مساعدة في الإشراف على الطلاب عند حجز مختبر الحاسب الآلي.
						ص لدي موارد كافية و برامج استطيع استخدامها مع طلابي (مثل نسخ مرخصة من برامج تعليمية).
						ق المعدات التكنولوجية المتاحة لي في المدرسة يمكن الاعتماد عليها.
						ر التكنولوجيا المتاحة في المدرسة سهلة الاستخدام (مثل Edline، السبورة التفاعلية).
						ش الآباء يعتبرون استخدام أجهزة الكمبيوتر من قبل الطلاب مضيعة للوقت.
						ت الآباء يهتمون أكثر بدرجات الطالب عن دمج التكنولوجيا.
						ث الطلاب لا يملكون التكنولوجيا اللازمة خارج الفصول الدراسية.
						خ التركيز على الامتحانات يقلل من الوقت المتاح في المناهج الدراسية لدمج تكنولوجيا المعلومات والاتصالات.

١٢. حدد مستوى الكفاءة الذي يصف مدي معرفتك ومهارتك في استخدام ما يلي:

	عالية	معتدلة	منخفضة	لا توجد	لا ينطبق علي
أ					
ب					
ج					
د					
هـ					
و					
ز					
ح					
ط					
ي					

١٣. يرجى الإشارة إلى مدى اتفاقك مع كل من العبارات التالية :

لا ينطبق	لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة		
						أ	دمج التكنولوجيا في التعليم مهم لتعليم الطلاب.
						ب	استخدم أجهزة الكمبيوتر بشكل منتظم في:
						ج	تسجيل أو حساب درجات الطلاب.
						د	كتابة خطط الدروس و ما شابه ذلك.
						هـ	الحصول على الموارد من الإنترنت لاستخدامها في الفصل.
						و	إضافة أعمال الطلبة، والواجبات المنزلية، وأوراق العمل على Edline.
						ز	تبادل أعمال الطلاب الكتابية عن طريق الإنترنت (على سبيل المثال، من خلال البريد الإلكتروني، Edline، وما إلى ذلك).
						ح	عرض مواد تعليمية باستخدام جهاز العرض المتاح في الفصول.
						ط	اطلب من الطلاب أن يقوموا بعمل أبحاث على الإنترنت ثم تقديم البيانات في شكل مكتوب أو رسوم بيانية.
						ي	توفير فرص للطلاب للعمل بشكل تعاوني في مجموعات على الانترنت.
						ك	التواصل مع أولياء الأمور عبر الانترنت.
						ل	دعم الطلاب تقنياً لإجراء بحوث على الإنترنت ثم تقديم البيانات في شكل مكتوب أو رسوم بيانية.
						م	دعم الطلاب تقنياً للتعاون والعمل في مجموعات على الانترنت.
							استخدام السبورة التفاعلية.

Appendix 5: Focus Group Consent Form – English Version



Documentation of Informed Consent for Participation in Research Study

Project Title: *Factors Affecting Elementary Teachers' Decision to Integrate Information and Communication Technologies (ICT) in Education*

Principal Investigator: *Shaimaa Mohamed Mohamed Hafez*

*You are being asked to participate in a research study. The purpose of the research is *to identify the factors that affect your decision to integrate ICT in your teaching to come up with a whole school plan of action that would help in increasing the effectiveness of ICT integration in the teaching and learning processes*. The findings may be *published and presented*. The expected duration of your participation is *one and a half hours*.

*There *will not be* certain risks or discomforts associated with this research. *I assure you that all your responses will remain confidential*.

*There *will be* benefits to you from this research *as your contribution in this study may help shape the future of ICT integration at our school hence increase the effectiveness of the teaching and learning processes*.

*The information you provide for purposes of this research *is confidential where your identity (name, initials, or any other identifying factors) will not be revealed. All information contributed during this session will be reported in an aggregate form*.

**In case you have any pertinent questions about the research, your rights, or whom to contact in the event of a research-related injury to you, you need to contact Shaimaa Hafez at 01001955862.*

*Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or the loss of benefits to which you are otherwise entitled.

Signature _____

Printed Name _____

Date _____

Appendix 6: Focus Group Consent Form – Arabic Version

الجامعة الأمريكية بالقاهرة

استمارة موافقة مسبقة للمشاركة في دراسة بحثية

عنوان البحث : العوامل المؤثرة على قرار معلمين المرحلة الابتدائية لدمج تكنولوجيا المعلومات والاتصالات في التعليم

الباحث الرئيسي: شيماء محمد محمد حافظ – مُعلمة حاسب آلي للمرحلة الابتدائية
البريد الإلكتروني: shafez@aucegypt.edu
الهاتف: ٠١٠٠١٩٥٥٨٦٢

انت مدعو للمشاركة في دراسة بحثية عن دمج تكنولوجيا المعلومات والاتصالات في التعليم.

هدف الدراسة هو تحديد العوامل التي تؤثر على قرار المدرسين لدمج تكنولوجيا المعلومات والاتصالات في التعليم من أجل التوصل إلى خطة عمل للمدرسة كلها من شأنها أن تساعد في زيادة فعالية إدماج تكنولوجيا المعلومات والاتصالات في عمليات التعليم والتعلم.

نتائج البحث ستُنشر في دوريه متخصصه أو مؤتمر علمي أو ربما كليهما.

المدة المتوقعة للمشاركة في هذا البحث ساعة و نصف.

المخاطر المتوقعة من المشاركة في هذه الدراسة: لا توجد اي مخاطر متوقعة وأؤكد لكم أن كافة إجاباتكم ستبقى سرية.

الاستفادة المتوقعة من المشاركة في البحث مساهمتكم في هذه الدراسة قد تساعد في تشكيل مستقبل دمج تكنولوجيا المعلومات والاتصالات في التعليم في مدرستنا و من ثم تساعد في زيادة فعالية عمليات التعليم والتعلم.

السرية واحترام الخصوصية: المعلومات التي ستدلى بها في هذا البحث سوف تكون سرية حيث لن هويتك (الاسم أو الأحرف الأولى من الاسم أو أي عوامل أخرى تحدد شخصيتك) معلنة في البحث. كافة المعلومات التي ستساهمون بها سوف تجمع في تقرير إجمالي.

في حال الرغبة في الحصول على مزيد من المعلومات عن الدراسة أو حقوق المشاركين فيها أو عند حدوث أي أصابات ناتجة عن هذه المشاركة يجب ان توجه الاتصال الي شيماء حافظ علي ٠١٠٠١٩٥٥٨٦٢

ان المشاركة في هذه الدراسة ماهي الا عمل تطوعي، حيث أن الامتناع عن المشاركة لايتضمن أي عقوبات أو فقدان أي مزايا تحقق لك. ويمكنك أيضا التوقف عن المشاركة في أي وقت من دون عقوبة أو فقدان لهذه المزايا.

.....: الامضاء

.....: اسم المشارك

...../...../.....: التاريخ

Appendix 7: Focus Group Protocol

Focus Group Protocol

The focus groups were included in the design of this study as a follow-up method to further process and utilize the findings of the questionnaire.

Participants in the focus groups will be chosen as outlined in the IRB application.

Participants in the focus groups will be asked to fill the consent form two days prior to the scheduled time for the focus groups.

The focus groups will be moderated by the PI, and a note taker will help in taking main points of discussion during the focus groups.

Two focus groups will be carried out; 6 to 10 teachers will participate in each of the focus groups and will meet for one and a half hours.

The focus group process will be conducted according to Wagner's and Kegan's 4 C's model as follows:

- The PI will welcome the teachers and thank them for participating in the research and being part of the focus group.
- The PI will explain the three main purposes of the focus group:
 1. To analyze the data collected from the survey to study the school culture, conditions, competencies, and contexts that are forming the current technology integration status in school X *"as is"*.
 2. To identify the ideal culture, conditions, competencies, and contexts that should be available to increase effective ICT adoption in education in the school. This will help in comparing our current situation to where we want *"to be"* as a school.
 3. To make suggestions for an action plan to help school X bridge the gap between its current status *"as is"* to the optimum status *"to be"* to improve ICT integration at school X.
- The PI will emphasize the importance of teachers' contributions. She will explain that teachers are expected to provide most of the input and that researcher's role is largely that of a facilitator who moderates the discussion. The facilitator will underscore the importance of each and every contribution, whether it is in agreement or disagreement with the majority. She will also reassure teachers of the absolute confidentiality of their responses.

- The main discussion in the focus group will be examining four major questions, and they will be discussed each at a time:
 1. Whether school X *culture* support active engagement and collaboration for continuous improvement?
 2. Whether the classroom and school *conditions* support ICT integration for the improvement of teaching and learning?
 3. Whether school X teachers possess the required *competencies* to successfully integrate ICT into education?
 4. What external factors shape the *context* within which school X takes its decisions to integrate ICT?
- To discuss each of these four questions, the PI will present the data collected from the survey in the form of charts to make it easy for teachers to understand the findings. Teachers will be given one chart at a time to discuss, and they will be offered a maximum of 8 charts to discuss through the whole focus group; two charts to discuss each of the four main questions.
- After discussing thoroughly and comparing the current ICT integration situation to the ideal situation, the teachers will be asked to design a realistic, clear, and achievable action plan to carry on the change process; to increase the effectiveness of ICT integration in the school.
- At the end of the focus group the PI will summarize the main points discussed and will ask the teachers if they have any other point to add or clarify.
- Finally the PI will thank the teachers for taking the time to participate in this discussion.

Appendix 8: Tables of Survey Responses

Appendix 8.a Table 1

Gender	Response Percent	Response Count
Male	11.1%	3
Female	88.9%	24
Total		27

Appendix 8.b Table 2

Age	Response Percent	Response Count
20 to 30	22.2%	6
31 to 40	48.1%	13
41 to 50	25.9%	7
51 to 60	3.7%	1
above 60	0.0%	0
Total		27

Appendix 8.c Table 3

Table 3 Teaching Experience		
	Response Percent	Response Count
0	0.0%	0
1	3.7%	1
2	0.0%	0
3	3.7%	1
4	0.0%	0
5	3.7%	1
6	18.5%	5
7	3.7%	1
8	3.7%	1
9	7.4%	2
10	7.4%	2
11	0.0%	0
12	11.1%	3
13	7.4%	2
14	0.0%	0
15	7.4%	2
16	3.7%	1
17	0.0%	0
18	7.4%	2
19	0.0%	0
20	0.0%	0
21	3.7%	1
22	3.7%	1
23	0.0%	0
24	0.0%	0
25	0.0%	0
above 25	3.7%	1
Total		27

Appendix 8.d Table 4

Table 4
Number of years working in the school

	Response Percent	Response Count
1	3.7%	1
2	29.6%	8
3	0.0%	0
4	3.7%	1
5	7.4%	2
6	14.8%	4
7	7.4%	2
8	11.1%	3
9	7.4%	2
10	14.8%	4
Total		27

Appendix 8.e Table 5Table 5
Subjects taught

	Response Percent	Response Count
Arabic	11.1%	3
Character Education	3.7%	1
Drama	3.7%	1
English/Language Arts	44.4%	12
English as Second Language (ESL)	3.7%	1
Fine Arts	3.7%	1
French	3.7%	1
Information and Communication Technology (ICT)	3.7%	1
Library Studies	0.0%	0
Mathematics	51.9%	14
Music	3.7%	1
Religion	7.4%	2
Science	44.4%	12
Special Education Needs (SEN)	3.7%	1
Social Studies	33.3%	9

Appendix 8.f Table 6

Table 6
Grade levels taught

	Response Percent	Response Count
G1	22.2%	6
G2	33.3%	9
G3	48.1%	13
G4	48.1%	13
G5	44.4%	12

Appendix 8.g Table 7

Table 7
Highest educational degree attained

	Response Percent	Response Count
Bachelors	37.0%	10
Masters	63.0%	17
Doctorate	0.0%	0
Other	0.0%	0
Total		27

Appendix 8.h Table 8

Table 8

Stage within technology adoption and integration into the teaching and learning process

	Response Percent	Response Count
I am aware of technology and have some basic skills but do not think I have sufficient expertise to use technology without assistance. I rarely require the use of technology by students to complete assignments.	14.8%	4
I can use basic software and some standard hardware comfortably. I occasionally require students to use basic technology resources to complete assignments.	51.9%	14
I use a variety of technology resources/tools in my preparation, instructional delivery, and evaluation. I often require students to use a variety of technology resources/tools in the construction of curriculum-based products.	22.2%	6
I am eager to share my teaching with technology experiences with my colleagues, and I encourage student/faculty interactions in discovering and utilizing different technologies beneficial to learning.	11.1%	3
Total		27

Appendix 8.i Table 9

Table 9
Importance of ICT integration for student learning

	Response Percent	Response Count
Strongly Agree	66.7%	18
Agree	25.9%	7
Neutral	3.7%	1
Disagree	3.7%	1
Strongly Disagree	0.0%	0
NA	0.0%	0
Total		27

Appendix 8.j Table 10Table 10
Culture

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	NA
Teachers with new ideas are encouraged.	7.4%	63.0%	25.9%	3.7%	0.0%	0.0%
Parents respect what teachers do.	0.0%	63.0%	29.6%	3.7%	0.0%	3.7%
Teachers work together to develop a school wide set of goals.	11.1%	48.1%	29.6%	7.4%	3.7%	0.0%
Parents are involved in their children's school experience.	7.4%	48.1%	22.2%	14.8%	0.0%	7.4%
All Staff members put the needs of students first.	11.1%	44.4%	29.6%	11.1%	0.0%	3.7%
Teachers participate in continuous professional development sessions.	7.4%	48.1%	22.2%	22.2%	0.0%	0.0%
Teachers in this school are involved in making important decisions.	18.5%	33.3%	25.9%	22.2%	0.0%	0.0%
Students work hard to achieve high academic standards.	0.0%	25.9%	55.6%	14.8%	0.0%	3.7%

Appendix 8.k Table 11Table 11
Conditions

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	NA
The available technology in school is easy-to-use (e.g. Edline, Interactive White Boards).	18.5%	63.0%	14.8%	3.7%	0.0%	0.0%
The technological equipment available to me at school is reliable.	11.1%	66.7%	7.4%	11.1%	3.7%	0.0%
The school has an existing policy for ICT integration in teaching and learning.	11.1%	59.3%	18.5%	11.1%	0.0%	0.0%
I have the freedom to make decisions regarding ICT integration.	18.5%	48.1%	25.9%	7.4%	0.0%	0.0%
I receive adequate technical support when integrating ICT in teaching.	7.4%	51.9%	14.8%	22.2%	0.0%	3.7%
It is easy for me to schedule the use of a technology-equipped classroom (e.g., computer lab).	11.1%	40.7%	29.6%	3.7%	3.7%	11.1%
I have access to adequate software resources to use with my students (e.g., licensed copies of educational software).	7.4%	37.0%	29.6%	22.2%	0.0%	3.7%
The school provides teachers with adequate time to plan for lessons integrating ICT.	3.7%	37.0%	18.5%	22.2%	14.8%	3.7%
I received adequate training in ICT integration at school.	7.4%	25.9%	22.2%	37.0%	7.4%	0.0%
I receive help in supervising students when reserving the computer lab.	14.8%	7.4%	37.0%	18.5%	3.7%	18.5%
I receive adequate instructional/pedagogical support on ways to integrate ICT in teaching.	3.7%	18.5%	25.9%	44.4%	3.7%	3.7%
School administration regularly evaluates teachers on integrating ICT in education.	7.4%	11.1%	14.8%	51.9%	11.1%	3.7%

Appendix 8.1 Table 12Table 12
Context

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	NA
Focus on exams reduces the time available in the curriculum to integrate ICT.	0.0%	63.0%	7.4%	25.9%	3.7%	0.0%
Parents are more concerned with student grades than technology integration.	18.5%	44.4%	14.8%	18.5%	0.0%	3.7%
Students don't have access to needed technology outside of the classroom.	3.7%	25.9%	25.9%	33.3%	7.4%	3.7%
Parents perceive using computers by students as a waste of time.	3.7%	7.4%	18.5%	63.0%	3.7%	3.7%

Appendix 8.m Table 13Table 13
Competencies

	High proficiency	Moderate proficiency	Low proficiency	No proficiency	NA
Write lesson plans and/or related notes.	66.7%	33.3%	0.0%	0.0%	0.0%
Display material using the projector in the classroom.	74.1%	22.2%	0.0%	0.0%	3.7%
Get resources from the Internet for use in the classroom.	66.7%	29.6%	3.7%	0.0%	0.0%
Correspond with parents via Internet.	48.1%	44.4%	3.7%	0.0%	3.7%
Record or calculate student grades.	55.6%	25.9%	3.7%	0.0%	14.8%
Post students' work, homework, and worksheets on Edline.	44.4%	29.6%	3.7%	0.0%	22.2%
Exchange student written work via the Internet (e.g., email attachments, through Edline, etc.).	33.3%	37.0%	11.1%	0.0%	18.5%
Support students technically to do Internet research then present data in a written and graphic form.	14.8%	44.4%	14.8%	0.0%	25.9%
Use the Interactive White Board.	14.8%	25.9%	18.5%	7.4%	33.3%
Support students technically to collaborate and work in groups online.	14.8%	14.8%	18.5%	14.8%	37.0%

Appendix 8.n Table 14Table 14
Technology Usage

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	NA
I regularly use computers to write lesson plans and/or related notes.	63.0%	22.2%	7.4%	3.7%	3.7%	0.0%
I regularly display material using the projector in the classroom.	77.8%	14.8%	3.7%	0.0%	0.0%	3.7%
I regularly use computers to get resources from the Internet for use in the classroom.	85.2%	14.8%	0.0%	0.0%	0.0%	0.0%
I regularly correspond with parents via Internet.	25.9%	40.7%	18.5%	11.1%	0.0%	3.7%
I regularly use computers to record or calculate student grades.	29.6%	37.0%	14.8%	11.1%	0.0%	7.4%
I regularly use computers to post students' work, homework, and worksheets on Edline.	63.0%	7.4%	11.1%	3.7%	0.0%	14.8%
I regularly use computers to exchange student written work via the Internet (e.g., email attachments, through Edline, etc.).	25.9%	22.2%	18.5%	18.5%	0.0%	14.8%
I regularly ask students to do Internet research then present data in a written and graphic form.	11.1%	25.9%	33.3%	11.1%	0.0%	18.5%
I regularly use the Interactive White Board.	22.2%	7.4%	11.1%	14.8%	7.4%	37.0%
I regularly offer opportunities for students to work collaboratively in groups online.	0.0%	0.0%	37.0%	22.2%	7.4%	33.3%