

The Manipulation of Digital Technology into The Classroom Settings: The Various Effects on The Teacher's role and Practices

*أثرالتقنية الرقمية في إعدادات الفصل الدراسي: التأثيرات المختلفة على دور المعلم
وممارساته*

by

ABDUL RAHMAN NAZMI ABOU NIAJ

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ABSTRACT

This study aims to explore the reception of digital technology as an educational tool among teachers. Undoubtedly, the introduction of digital technology into Education has proven essential in a world that is governed by technology. However, the smoothness and success of this introduction seem to greatly vary based on the attitudes that teachers hold toward it and their performance in it. To assess these attitudes, this study has taken the case of one school in the UAE and performed extensive data collection on the aforementioned issue through interviews and observations. In line with previous literature, this research that teacher' views on digital technology on greatly impacted by their previous experiences with it as well as the support and coordination provided by administrations.

ملخص البحث

تهدف هذه الدراسة إلى إستكشاف إستقبال التقنيات الرقمية كأداة تعليمية بين المعلمين. مما لا شك فيه، أن إدخال التقنيات الرقمية في التعليم أثبت أنه ضروري في عالم تحكمه التقنيات. ومع ذلك، يبدو أن سلاسة ونجاح هذه الخطوة (إستخدام التقنيات) يختلفان كثيرًا حسب المواقف التي يتخذها المعلمون تجاهها وأدائهم فيها. لتقييم هذه المواقف، إتخذت هذه الدراسة حالة مدرسة واحدة في دولة الإمارات العربية المتحدة وأجرت مجموعة واسعة من جمع البيانات حول القضية المذكورة أعلاه من خلال المقابلات والملاحظات. تمشيا مع الأبحاث السابقة، أظهر هذا البحث أن آراء المعلمين حول التكنولوجيا الرقمية تتأثر بشكل كبير بتجاربهم السابقة معها وكذلك الدعم والتنسيق المقدمين من الإدارات.

DEDICATION

I dedicate this dissertation to the sake of Allah Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge and understanding. I also dedicate it to my precious mom for her love and care and to my dear dad for his guidance and motivation. To my wife for her love, understanding, prayers and continuing support to complete this research work. To my beloved son, whom I can't force myself to stop loving and who has been my strength in the challenging days. A special feeling of gratitude to my loving sisters, whose words of encouragement and push for tenacity ring in my ears. To all my family, the symbol of love and giving.

All the people in my life who touch my heart, I dedicate this research.

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Chapter 1

INTRODUCTION

Educational institutions often embrace numerous players, structures, connections, and opinions as external influences that may add value to Education and enlighten the students (Salavati 2013). Recently, the manipulation of digital technologies into the classroom settings has been one such element that institutions around the globe have appreciated. With that, however, many challenges were introduced to the field of Education and the main actors in it, i.e. teachers. The everyday life of teachers in the United Arab Emirates (UAE) is particularly intricate since they need to satisfy the requirements of multiple groups of people, like parents, administration, and authorities, while engaging the students with technological tools. This dissertation will analyze the context through which digital technologies have been introduced to UAE schools, including the perceptions that educators have toward such technologies and the complexity that arises upon their introduction.

The presence of interactive white boards, a main facet of digital technologies, as well as the urgent use of tablet devices are strikingly increasing (Skolinspektionen 2012). Recently, attendees of many schools have been allowed to fetch their own personal devices with them to school with the claim that they are used for educational purposes (Skolverket 2016 a). Even among teachers, the utilization of personal computers is becoming typical. The introduction of digital technology to the school settings is in continuous proliferation (Skolverket 2016 a).

Many recent reports declared that these technology tools are mostly used for administrative issues, rather than for pedagogical purposes (Thullberg & Millstam 2010).

Although the integration of digital technology within the teaching and learning processes carries with it many difficulties and challenges, the magnitude its benefits cannot be disregarded. Digitalization generated a keen and vigorous manipulating power tailoring the way Education is implemented and what the upcoming generation is expected to do (Salavati 2013). Hence, modernistic learning tools are a necessity for both teachers and students in order to catch up with the contemporary Education. This was clearly stated:

The school is responsible for ensuring that each pupil on completing compulsory school [...] can use modern technology as a tool in the search for knowledge, communication, creativity, and learning (Skolverket, 2011b pp.13-14).

As a European authority, The European Commission addressed digital technologies as well:

Information and Communication Technologies (ICT) help us learn better, more efficiently and creatively, to innovate, to solve complex problems and access wider and more up-to-date knowledge (European Commission's Digital Agenda for Europe¹ 2015).

As per the above-mentioned statement, The European Commission asserts that the use of digital technologies allows resilient and attainable learning, whether inside or outside the school. Many scholars such as Milrad, et al. (2013) concurred that digital technologies permit wealthier, broader, and more profound learning experiences in many different settings, not only the school. Teachers in Salavati (2013) study confirmed that learning becomes more authentic and contextualized through the implementation of some learning experiences outside the classroom since students will be given the opportunity to see what they are learning from another viewpoint.

¹ Digital Agenda for Europe, Digital Life <http://ec.europa.eu/digital-agenda/en/education>.

1.1. Problem Statement

To investigate the afore-mentioned process, it is important to determine the main actors in it, including those who impact the digitalization of Education and those who are impacted by it. This section will establish these stakeholders and the context of this digitalization, guiding the formulation of our research questions.

Gronlund (2014) asserts that some pedagogical amendments and adjustments in a learning environment should be done by school personnel. In line with that, Tallvid (2015) declares that when they took the decision, school leaders and stakeholders obliged teachers to integrate digital technologies in the schools. Nonetheless, teachers usually enjoy some autonomy in the school. Most of them are responsible for setting detailed plans for their teaching without the interference of or the influence from neither school leaders nor governmental stakeholders. Hence, the actual integration and implementation of digital technology within schools has been carried out by teachers within their traditional job practices (Tallvid 2015).

Digital Technology tools have entered schools but the traditional procedures of taking decisions concerning curricula are still the same. The integration of digital technology into schools should not focus exclusively on devices and tools. Rather, it should also focus on pedagogy and perspectives on learning processes. Gronlund (2014) further adds that it is not enough to ensure that teachers are well competent in using digital devices. Instead, light should be shed on the workstyle of teachers, the available teaching resources, and students' school work. All these issues must be adapted in order to reach factual positive results.

Gronlund (2014) states that the essential changes needed for the integration of digital technology into schools must be done in collaboration between school leaders, classroom teachers, and even commercial life stakeholders. Similarly, Tallvid (2015) realizes that amendments within

the organization of the school should be completed in order to well-integrate technology into each classroom.

There is an obvious divergence and an ideational conflict between the viewpoint of teachers and stakeholders on these matters (Cuban 2013). The system of digital technology usage in the everyday classroom routine is complicated, challenging, and chaotic, which led to the urgent need to inquire into it from within an authentic context: the school.

1.2. Research Aim and Questions

Although digital technology tools are accessible in many schools, they are, most of the times, not used efficiently. Cuban (2013) advocates investment in technology within the Education systems, believing that such investment will have benefits both for teachers and students. Nonetheless, the reality of educational systems proved to be defying since teachers receive commands from many directions.

Teaching practices are distinctly complex since they are affected by many decision-makers, actors, structures, and relations, who are of different positions and authorities. Amidst all this complicated environment, teachers carry upon their shoulders the responsibility of implementing digital technologies within their teaching (Salavati 2013). Griffin (2003) claimed that digital technologies feed the teaching processes with enthusiasm and power. However, the actual presence of these benefits depends on the teacher in charge. Learning is usually improved by teachers' performance and their cleverness in well-employing digital technologies for their service (Griffin, 2003). Hence, there is an urgent need to research the way learning processes could be altered and teachers' practices could be modified to the better rather than the worse.

Dewey (1929) stated that the factual Education is not figured out within classrooms, books or laboratories; it is rather figured out within the minds involved in education. In addition, Tondeur

et al. (2008) disputed that innovation within the field of Education can only be fulfilled when teachers' viewpoints and ideologies are taken into consideration. He explained that teachers are likely to accept innovations or changes when these latter go line in line with the way they look at teaching. Hence, the integration of digital technologies into education is much more complicated when teachers fail to understand its benefits (Tondeur et al. 2008).

According to Gaffney_(2010) two measures are considered when teachers make use of digital technologies. The first is to understand the multi-dimensional world of teachers, while the second is to understand the multi-sourced influences affecting them. When investigating into a teacher's mind, one might assume how he/she perceives teaching and learning, and how this perception affects his/her teaching practices. Subsequently, we can understand how and why he/she deals with digital technologies the way they do (Salavati, 2013).

As such, this research aims to *contribute to the comprehension of how intricate the teachers' daily practices become when making use of digital technology*. Taking into consideration the significance of contextual factors in determining a teacher's perceptions, attitudes, and interaction with digital technology, this research employs a one-school approach that quantitative and qualitative data. That is, due to the present limitations in time, a deep investigation into the contextual factors and various stakeholders leading to a full picture of the environment affecting teachers could only be done for one school. Quantitative methods will be employed to assess the experiences of diverse teachers with digital technology. This combination will allow us to weigh the impact of environmental factors versus teachers' distinct belief systems on the way teachers interact with digital technology.

In order to accomplish the aim of this research, two main research questions, with three sub questions, are addressed:

1. How do teachers perceive the integration of digital technologies into their everyday teaching practices?
 - i. How do teachers understand their occupational functions in education?
 - ii. How do teachers understand learning processes?
 - iii. How well does the use of digital technology meet teachers' conceptions of teaching and learning?
2. What are the hidden issues that contribute to raising the complexity of teachers' everyday practices using digital technology?

This research does not aim to judge the use of digital technologies within teaching and learning, or to determine whether it is beneficial or not. Instead, it aims to study teachers' perspective on the role of digital technology and the effect of its use within education.

1.3. Scope of the Study and Limitations

Teachers play an important role in raising prosperous generations and citizens to lead. Hence, these citizens need to be trained on how to use the tools that support them in contributing to the improvement of their societies such as technology. This latter is crucial to every side of the society: it is used both in the public and private circles. Nevertheless, schools are still unable to use technology effectively. Cuban (2013) claimed that schools need to change, and in order to change, we should shed light on the heavy and exhausting type of work that teachers do. Add to that, we should examine teaching and learning processes very closely in order to get a better understanding of the situation.

Being overwhelmed with all of this intricacy and chaos, and aiming at accomplishing the research aims, there is an urgent call to shed light on the extent to which a teacher's work practices become complicated with the use of technology as a part of the traditional teaching practices.

Understanding the essentials of the field of Education requires a profound understanding of the nature of teachers' work. For this reason, this research will provide a general review of the characterization of the field as well. As such, a deep understanding of teachers' daily practices will be provided. The scope of this research embraces learning in general, societal issues, challenges, and the political and organizational perspectives regarding the use of digital technologies within education.

Mishra and Koehler (2006) declare that developing theories on education and technology is a complicated process since it necessitates a deep understanding of sophisticated relationships that are bound by context. Subsequently, this dissertation will limit its empirical research to one school and a certain number of teachers, aiming to well-comprehend the current cases and perspectives. In order to have accurate data, a multitude of practices including lesson delivery, preparations, office work, and breaks, will be observed.

Teachers' work-at-home is also considered a part of teachers' everyday practices as it affects teachers' performance in the classroom. Nonetheless, the observation of this practice is unfeasible and, consequently, will be excluded from this research. Teachers did not have time to write notes of their daily rituals. As such, this dissertation relied on a limited understanding of the whole situation influencing their performance, and this understanding was based on a few interviews and observations.

As for students' perspectives on the use of digital technologies within education, it will only be mentioned through the teachers' perspectives.

1.4. Thesis Organization

The remaining part of this dissertation follows the structure elaborated below:

Chapter 2 reviews the literature related to our area of concern. It focuses on the complexity of the current use of the widespread digital technologies in education daily. It also presents the relation between education and digital technology, highlighting some phenomena of learning as well as the philosophy of teaching. In addition, Chapter 2 focuses both on teachers and technology in order to investigate deeply into the perceptions of teachers towards the use of technology.

Chapter 3 describes the methodology adopted in the empirical part of this study. It presents the methods and tools used for data collection. In addition, it elucidates the methodology used for data analysis, the ethical accounts, and the limitations.

Chapter 4 displays the data collected through the empirical study. This data mirrors the current situation of the use of digital technologies in the everyday teaching practices.

Chapter 5 involves a thorough analysis of the data collected. There is a discussion of the major cases in relation to what the literature says. The implications of the daily use of digital technologies are also discussed. This chapter also involves a description of the learnings gained while carrying-out this research.

Chapter 6 states and elaborates the conclusions drawn by this research. It adds knowledge to the literature on digital technology and education. The chapter also suggests new studies that might be conducted in the future.

Chapter 2

LITERATURE REVIEW

To better understand the scientific views and the present knowledge on the introduction of digital technologies into education, this section will review the related existing literature. It will begin with a discussion on the complexity of molding technological tools to serve pedagogical purposes, for both educators, learners, and policymakers. Then, two sections will follow, discussing the links between technology and Education, and the perceptions of teachers of such links, respectively.

This discussion provides background information on the topics and questions that this dissertation addresses. By presenting the various academic opinions on the introduction of digital technology into education, it draws a picture of the knowledge that has been already established and the questions that are yet to be investigated. Accordingly, the position of teachers within the framework of digitalization was chosen as an important topic to investigate.

2.1. The Complexity of the Current Use of Digital Technology in Education

2.1.1. The Challenges of Technology Enhanced Learning

Kurti (2009) pointed out three domains of challenge within Technology-Enhanced Learning (TEL). He listed them as follows: Technology and Engineering; Design and Interaction; and Learning, Social and Cognitive domains. Technology and Engineering include the creation of devices, tools, and technological platforms, and the adaptation of such elements for educational purposes. The second domain, Design and Interaction, focuses on the foundation of learning activities and curricula using the new technological methods. Lastly, the Learning, Social, and

Cognitive challenges concern the provision of contextual sensitivity to the new pedagogical tools, taking into account the science of development and the growth of learners.

Salavati (2013) recognized three other challenge domains: organizational, political, and resources. As implied by their titles, these challenges concern the development of organized school structures that can handle potential problems and issues appropriately, the reinforcement of policies and laws that regulate the implementation of such structures and protect the impacted groups and individuals, and the funding and provision of adequate related sources.

According to Kurti (2009)'s analysis of Technology-Enhanced Learning, this latter is composed of five elements: human-beings (learners), the systematized environment where learning occurs, the various tools of technology, the resources, and the interaction that takes place among all the previous elements. The various tools, the resources, and the interaction that takes place between these elements may be figured out in the process of addressing the challenges mentioned above, since they fall within the discussed domains identified by Kurti (2009) and Salavati (2013). However, it is noteworthy that human beings and the systematized learning environment were not pointedly explored by these challenge domains, nor do they fit well in any of them.

All the challenges listed above affect Technology-Enhanced Learning in certain ways. These different challenges do not only affect TEL, but they also do exacerbate the negative influences of one another if not addressed well, and in parallel, in the societies and organizations within which TEL is implemented.

2.1.2. The Complicated Questionable Situation

The complicated questionable situation of Technology Enhanced Learning is primarily the offshoot of the fast-societal development. This is illustrated by the wide-scale transition from

traditional paper books and chalkboards to the excessive use of technological tools, like interactive whiteboards that replaced the old blackboards (Skolverket 2013b). Furthermore, the quick spread of cellphones, laptops, and desktops that occurred throughout the society allowed these inventions to replace the traditional everyday life tools. Hence, the manner and pace at which such technologies emerged within diverse societies have been the most robust and weighty factor changing the shape of both the personal everyday life and the professional work life.

Salavati (2013) states that authorities are failing to set specific guidelines and provide educational samples that explain the best techniques for incorporating digital technology into teaching and learning processes. Thus, despite the fact that many schools may be equipped with digital technologies, it can obviously be seen that teachers face many complications when trying to integrate technology into their teaching. For instance, Tallvid (2014) showed that a heavy workload often prevents teachers from exploring digital technologies and bringing them into their classes. Furthermore, researchers are increasingly recognizing the intersectionality and interchangeability of the private, public, and professional aspects of human lives (Bradley, 2010). Therefore, it would be ineffective to treat teachers as an isolated factor that only interacts with digital technology through schools; rather, their previous experiences, skills, and knowledge need to be accounted for by policies and approaches aiming to integrate digital technologies into education.

Jenkins (2009) states that there are new literacies, knowledge and skills that this generation's students need to have in order to be leading citizens in the future society. According to Salavati (2013), the implementation of digital technologies provides students with new opportunities and more benefits. Nonetheless, it challenges both students and teachers, for the majority of the current generation are knowledgeable and skilled enough in terms of digital

technology, but continue to be unaware of the dangers, challenges, and risks that are linked to such technologies.

2.1.3. Other Issues Generated from Digital Technology Use

Scholars agree on the sophistication, and sometimes messiness, of educational processes (Gaffney, 2010; Cuban, 2013). The digitation of such processes may be seen as to only add to their existing complexity. A number of challenges linked to the smoothness, practicality, and success of such digitation has been previously mentioned. Yet, there are other unprecedented challenges and obstacles that may arise as a result of the philosophies held in relation to this renovation and its alignment with the causes and purposes of Education.

First, most policies, organizations, and researchers are cascading large efforts to reach a successful implementation of digital technology in schools. Though the reasons and purposes of this implementation remain vague and unidentified on the policy-level. For instance, according to Salavati (2016), when equity is used as an argument behind the digitation of Education, the meanings of this argument often remain unspecified. In this case, equity could signify the delivery of equal educational services to all students, the provision of equal technological-pedagogical tools to schools and organizations, or the production of equal educational, growth, and learning outcomes for all learners.

The level of control enabled to teachers and school administrators in applying the tools of digital technology in the schools has an impact on the success of these tools as pedagogical ones. Cuban (2013) and Grönlund (2014) noted that authoritative administrators believe in the necessity of running certain common digitation policies for all schools, while giving each institution a certain margin for adapting digital tools into the local and contextual needs at their respective institutions. Such needs include the specific complex everyday practices of teachers and

the skills and responsiveness of students. Cuban (2013) showed that although authorities and policy-makers may display awareness of the complexity of teaching practices, this may not be the reality. The lack of awareness of such micro-systems of Education-related exercises, in addition to the denial of such incomprehension, may lead policy-makers to frame impractical regulations. The more external agents play into limiting the roles and abilities of teachers and administrations in regulating digitation, the less fruitful this latter would be (Jensinger, 2014; Salavati, 2016).

2.2. The Link between Education and Digital Technology

2.2.1. Overview on Learning Processes

Humanity has been trying to untangle and understand its environment since long time ago. The idea of establishing buildings or environments for teaching and learning, what is known nowadays as schools, started almost 5000 years ago, and continues to survive until this day (Lundgren & Saljo, 2014). According to Lundgren and Saljo (2014), the concept of a curriculum was invented for the sake of organizing the process of learning and allowing educators to meet certain educational goals. Curricula were structured based on the social, economic, and cultural status that regulates one's society. The learning objectives originated from two rational questions: (1) what is worth knowing? and (2) what is the social significance of knowing this? (Lundgren, 2014). Lundgren (2014) asserts that Education is influenced by ideologies, which appoint the purposes of Education and define knowledge in a unique way.

Melissinopoulos (2013) suggests that pedagogy and didactics are the two main disciplines of Education. These two disciplines appear to be intricate, but also clashing and perplexing. He debates that these two disciplines belong to two different fields located in the same region of educational research. He also adds that pedagogy aims at transforming learners into the social

subjects of the future. As explained by Ladson-Billings (1995), pedagogy promotes the academic and professional successes of students, but also their active integration into the structure of their societies.

As for didactics, it was divided by Messinopoulos (2013) into three different regions:

- (1) what-region, concerning the content of teaching,*
- (2) how-region, concerning the method of teaching, and*
- (3) why-region, addressing the justification of curricular choices*

Thus, didactics combines both the creativity in teaching in addition to the knowledge and skills. The need for these components becomes even clearer in Vellopoulou and Ravanis (2010)'s distinction of two separate phases of didactic processes. The first phase focuses on the transformation of science into knowledge and information suitable for teaching, termed as “school knowledge”. The second one relates the adaptations of this last knowledge into educational contexts by the educators, making it “taught knowledge”. As such, according to Lundgren (2014), didactics bring significant knowledge related to the way learning occurs within a certain community or school.

Since the job of didactics is to establish the foundations that will change Education, to provide a better way for content teaching and learning, and to plan for the appropriate settings and means for Education, Salavati (2016) ascertains its significant impact on teaching practices related to digital technology. Moreover, she adds that the way pedagogy and didactics are established and understood by a school and/ or a teacher, affects the design of digital technology tools in that school, as well as the subsequent interactions with these tools.

2.2.2. The Profession of Teaching

Dewey (1929) defined teachers as the factor that makes the foundation and origin of knowledge. Teachers are the individuals who were embodied in pedestals (Kennedy, 2008). They have a central authority within the classroom in specific, and within the school in general (Kennedy, 2008). Jarvis (2006) approved on the definition of teachers provided by Dewey and Kennedy. He asserts that the typical image of a teacher is that of a person who controls certain elements of knowledge to be communicated with students, and the one who informs students about what they should learn, motivates them, and helps put what they learn into practice. Nonetheless, he states that teachers' role is not the same as before anymore. Kennedy (2008) declares that time forced teachers to develop their rigidity and flexibility so that they can deal with students as time changes. Nowadays' teachers must symbolize maturity in front of students' naughtiness (Kennedy, 2008). Furthermore, Jarvis (2006) discusses that teachers do not play the role of delivering fixed knowledge anymore. Instead, they are expected to deal with the rapidly changing knowledge and keep themselves up-to-date. Add to that, teachers do not teach their students theories anymore. Instead, they should scaffold their students and support them to earn experiential knowledge. Moreover, teachers need to use students' prior knowledge and try to build upon it (Jarvis, 2006).

Liberg (2014) states that teachers take the responsibility of everything taking place within the educational environment – they play the role of composers and orchestrators at the same time. He also explains that in Denmark, Germany, and Norway, teachers focus on didactics more than in other countries, which are totally influenced by the American Education traditions. Kennedy (2008) declares that teaching is a profession that requires much thought and many professional decisions. Liberg (2014, p.336) points out that the teaching profession builds on two major questions: “what” and “why”. Although syllabi and curricula have the largest contribution

in choosing what to teach, Liberg (2014) still states that teachers' decisions may enhance many characteristics of teaching, while other characteristics may be erased at the same time.

According to Liberg (2014), when teachers decide on the content they want to teach to their students, they should take into consideration who they are teaching. What students are learning today affects what they will be learning tomorrow since learning is a continuous process. Thus, one can conclude that teaching and learning have a reciprocal relationship among each other (Liberg, 2014).

Successful teachers are usually distinguished with many features. One of them is the ability to organize, manage, and deliver complicated notions to their students (Griffin, 2003). Teachers are expected to have elaborate knowledge and extensive experience in a range of fields and topics. They are also expected to adapt and change their teaching approaches according to the different needs of their students (Bates, 2015). Bates (2015) asserts that there is no one unified way of teaching that suits all contexts and situations. He explains that a successful teacher makes use of the approaches, methods and tools that he/she is familiar with based on the teaching situation she/he has. Furthermore, he adds that every teacher is distinguished with a unique mentality towards what is the best teaching approach. Jarvis (2006) concurs with Bates (2015) when declaring that a teacher's teaching style may be discovered through studying his/her personality. He also states that teaching is a combination of art and science at the same time, and thus, the philosophy of a teacher can be found out by observing the teaching style he/she has. Moreover, Bates (2015) states that theoretical knowledge and training are not enough to produce successful teachers. Instead, teachers need to be talented in this field and to have compassion with their students. In addition, successful teachers are usually passionate about teaching, which emphasizes the importance of emotions in this field.

2.2.3. The Teaching Philosophy of Teachers

Both Liberg (2014) and Mellisinopoulos (2013) agreed on the importance of the “what” and “why” questions in the field of teaching. Mellisinopoulos (2013) also added the question of “how”. The aforementioned questions tell us a lot about the teachers’ philosophy of teaching. A teacher’s philosophy of teaching elaborates on his/her own personal attitudes towards teaching and also about his/her performance in this regard (Korn, Stephen & Slikorski, 2012). Kenny (2008) defines and describes the philosophy of teaching as follows:

A teaching philosophy statement clearly and logically communicates what your fundamental values and beliefs are about teaching and learning, why you hold these values and beliefs into your everyday teaching and learning experiences. (Kenny, 2008, p.6)

Philosophies of teaching support teachers in understanding the “why”-question and help them have a good background of both the “how” and “what”-questions. Salavati (2016) identified the factors that have pushed a teacher into choosing their profession as primary players in the determination of their teaching philosophy. Two main factors mentioned in this research, being inspired by previous teachers or driven by failed experiences, are related to previous experience within educational contexts.

Although Goodyear and Allchin (1998) point out to the differences between the “why”-, the “how”-, and the “what”-questions, they also state that all of the three are of equal importance. Additionally, they mention 4 features of the teaching philosophy. Firstly, the teaching philosophy portrays one’s identity and sheds light on the themes used by this person for educational activities. Secondly, the philosophy gives a definition of teaching through linking it to other occupational duties. Thirdly, a teaching philosophy provides a list of standards that a teacher needs to abide by

so that his/her behavior can be controlled. Lastly, sharing the philosophy with fellows allows the professional discussion, the maturity, and the continuous development among them (Goodyear & Allchin, 1998).

2.3. Teachers' Perceptions and Use of digital technology

2.3.1. The Diversity of Attitudes towards the Integration of Technology in Education

As with most modern approaches and methods being newly implemented in the field of Education, digital technology tools' introduction into schools was met with a wide array of perceptions from the side of teachers. These variant views can be classified along a continuum with two extremes, one that advocates digital technology as a necessary educational tool, and another that opposes it for a range of reasons. As reported by Skolinspektionen (2011; 2012), a large percentage of teachers fall in between these extremes, with generally agreeable attitudes toward technology, accompanied by concerns about the limitations and challenges that it may bring into Education. The view of technology as a development that induces students' appreciation of education and creates a common ground where the teachers' efforts and the students' needs can intersect was identified among 40% of teachers (Skolinspektionen, 2011; 2012). Yet, teachers determined this outcome to be contingent upon the incorporation of extensive and comprehensive IT-pedagogical support within schools' systems.

Salavati (2013), identified another common view on the use of digital technology in education. Employing the Unified Theory of Acceptance and Use of Technology, UTAUT (Venkatesh, et al., 2003), she noted that teachers' appreciation of digital technology is significantly related to the type of involvement they have with the use of it. The use of digital technology following appropriate training was rated positively by teachers, as opposed to their involvement

in researching and discovering approaches to employ such technologies in education, which was perceived as inefficient. Salavati (2013) resolved this sequel to be the result of Effort Expectancy, a variable that includes components such as ease-of-use, user-friendliness, and reliability, and which impacts teachers' perception of certain digital-educational tools.

Tondeur, et al. (2008) suggested a relation exists between teachers' general beliefs and philosophies on education and their attitudes toward digital technology's integration in educational system. Their research on teaching beliefs led to the identification of two main approaches of Education: constructivist teaching (student-centered) and traditional teaching (teacher-centered). Their data showed that teachers with more traditional beliefs on Education were most likely to perceive digital technology as a learning tool and use it accordingly. Alternatively, those who appreciate constructivist teaching were most likely to perceive technology and use it as a tool of instruction and information delivery. As for those who embrace both approaches, the perceptions and uses of digital technologies were most diverse. Additionally, it was noted that teachers with constructivist approaches of education employ digital technology in their classes most persistently.

Finally, in a study on the factors that avert teachers from using digital technologies in class, Tallvid (2014) identified two factors that are linked to their negative attitudes and perceptions of such use. The first perception is that the impact and value brought by the introduction of technology to schools is either insignificant or of a very low magnitude relative to the amount of efforts, time, and resources invested in implementing it. According to Tallvid (2014), such views result from a failure to perceive the various dimensions of digital technology's impact in Education, as well as the interconnection of Education with social aspects and developments. Secondly, some teachers view that digital technologies have a negative influence on their level of

control over the class, due to its expansion of the student access to information beyond the scope intended by the teacher, or its disruption of student concentration on class material.

2.3.2. The Impact of the Adoption of Variant Views on Teachers' Daily Practices

Based on our discussion of the various attitudes adopted by teachers when it comes to digital technology, it can be reasoned that those with positive views on this latter are most likely to employ its tools in their classes. Notably, teachers who adopt a worldview of education as a process that helps human beings grow into impactful individuals with wide potentials are the ones who invest the most efforts in the incorporation of technology in their classes (Salavati, 2016). Alternatively, Tallvid (2014) noted that when teachers adopt negative views on digital technologies, which emphasize the inefficiency of such educational methods or their negative influence, they are less likely to employ digital technology tools in their classes on a regular basis and for a diversity of aims, despite having received the support needed to implement such tools.

Skolverket (2016b) showed that, in addition to using technological tools in class, teachers are more inclined to employ new practices to ensure student safety and maximize their own knowledge on certain issues when they have positive attitudes toward digital technology. One example of such practices is requesting educational sessions on internet safety, the policies and laws related to its usage in schools, and the strategies of responding to and resolving internet violence. As such, teachers who acknowledge the weight of employing digital technology to achieve the delivery of effective and need-responsive Education will take further action toward making sure that this enactment is as effective, context-aware, and sensitive as possible (Skolverket, 2013b).

2.3.3. The Relation between the Reception and Impact of Digital Technologies and Teachers' Attitudes toward Them

It has been mentioned how certain predetermined philosophies and understandings of education can shape teachers' viewpoints of digital technology use in Education. Though other situational factors can play equally important roles in molding these viewpoints. To draw a complete understanding of teachers' attitudes, it is critical to illustrate each of these factors and entangle their action and influence.

Primarily, technological and logistical factors that arise during the implementation of digital tools partially drive the discussed attitudes. Skolverket (2016b) found that the need for IT-pedagogical support is one such factor. Teachers limit their use of digital technology as a result of failures and crashes in the equipment, and/or lack of assistance in addressing such issues (Salavati, 2013). One factor linked to the latter is the availability of appropriate trainings for the teachers to learn the logistics of employing digital technology in class (Salavati, 2013). Teachers who have the essential technical support will keep their positive views on technology. On the other hand, teachers who perceive themselves to be incompetent on the technological level avoid using digital technologies in their classes. Teachers feel especially inhibited toward the use of technology in class when they experience issues that can be easily resolved by students (Tallvid, 2014). Paradoxically, the teachers in this research noted that it is mostly unmanageable to keep themselves up-to-date with the technological developments due to their fast-paced nature.

The second level of factors is linked to the nature and approaches of policies that introduce digital technology to Education. Tondeur, et al. (2008) found that when such policies are executed in urgent manner, disregarding educators' need for time and support to engage with digital technology tools, teachers feel pressured to effect major enhancements to their educational beliefs

and practices abruptly. That causes many of them to discard these policies, their content, and aims (OECD, 2010; Grönlund, 2014). Instead, the implementation of policies in this regard should occur within a system that has received adequate exposure to digital technology on all its levels.

Third, the responsiveness and interaction of students with the digital tools introduced by teachers play a huge role in determining the commitment that teachers make to these tools (Salavati, 2013). Teachers try to dissect students' responses to create a feedback for their work and efforts. When they notice the failure of certain technology tools in addressing some students' needs, they cease to employ them. On the other hand, when they notice an increase in students' motivation to engage in class activities and discover the materials, teachers will regard this outcome as a rewarding one, therefore increase their utilization of technological tools. This factor falls under the category of Social Influences, identified in Salavati (2013) model. This category also accounts for the interaction of the wider society, including parents, with the utilization of digital technologies by teachers. When teachers' surrounding societies are moving towards digitization at a fast pace, teachers feel the pressure to keep up with that, therefore, increase their usage of technology in class.

Several other factors related to the practicality of integrating technology into education can alter teachers' attitudes toward this movement. For instance, when the digitization occurs without sufficient preparations, tools, and support, teachers' workload increases, since they have to compensate for the lack of present resources. In such circumstances, teachers will most likely turn toward adopting negative attitudes on the digitization of Education, based on their negative experiences with it (Tallvid, 2014).

To sum up, there is a reciprocal relation between teachers' perceptions of digital technologies in education and the context of their employment of its tools. In other words, based

on where the educators' views of technology fall, the degree to which they will integrate it in their classes can be expected. On the other hand, when teachers employ technology tools in their classes, the facilitation and reception that they are encountered with can determine the frequency of their usage, as well as alter their views on such usage. Therefore, for a successful integration of digital technology in Education, there needs to be a combination of welcoming attitudes from the side of teachers, and suitable contextual factors from the side of schools, policy-makers, and technology providers.

2.4. Hypotheses

Throughout this section, it has been shown that despite the extensiveness of research on digital technologies in education, teachers' positions in that field continue to be vague and complex, emphasizing the need to further investigate them through this dissertation. To narrow down this investigation, five hypotheses will be suggested for testing in order to answer our questions:

Hypothesis 1: Teachers attitudes toward the integration of digital technologies into education are significantly impacted by their previous experiences with such technologies.

Hypothesis 2: Teachers with prior positive experience with digital technologies perceive their occupational functions to be complex.

Hypothesis 3: Teachers with prior positive experience with digital technologies perceive learning processes to be complex and evolving.

Hypothesis 4: Teachers with prior positive experience with digital technologies perceive these technologies to be closely related to their identities as teachers.

Hypothesis 5: There is a perception that the lack of high-level coordination between authorities and school personnel raises the complexity of the use of digital technologies.

Finally, this literature review has dissected the diverse research methods employed in the field, as well as the pros and cons of each, guiding our own research methods and design. By showing the diversity of opinions and attitudes toward digital technologies, it has empowered us to make use of a mixed-methods approach, which will be further justified in the following section.

Chapter 3

METHODOLOGY

In previous sections, the significance of the topic of the integration of digital technology into Education has been established. Moreover, the question of this research has been set to investigate how teachers perceive this integration and what complex issues seem to arise for them as a result of it. This section will explain this research's approach of answering these questions, which can be characterized as a one-school, mixed-methods approach, aiming to present a full picture of the situation in the targeted school. Additionally, the employed interpretative evaluation methods will be explained and their relevance to the questions will be established. The settings of this research will be first introduced, then the methods of collecting the data and treating it will be elaborated. Finally, the rationale behind choice of a mixed-methods approach and an evaluation of this choice will close the section.

3.1. Research Settings

The empirical part of this research was carried out in a school located in the United Arab Emirates. The school is a KG-grade 12 school and is attended by 2132 students. At the time of data collection, 142 teachers were employed in the school and taught a variety of levels from KGs to grade 12. The school is led by one main principle, who has under his authority the Senior Leadership Team (SLT) and the Middle Management Team (MMT). In addition, the principle of KG1 and KG2, and the heads of sections have direct reporting to the first principle. The structure of the school also includes 4 administrative employees who are the curriculum coordinator, the assessment coordinator, the activity coordinator and the inclusion coordinator.

This empirical study focused on grades 9, 10, 11, and 12. Both grades 9 and 11 have 6 sections. Arabic, English, Moral Studies, and Islamic Studies are major subject matters in all the four grades. The other courses may vary according to the grade level and students' interests and include major and elective subjects. In our area of concern, grades 9 to 12, boys and girls are separated in different sections. In the girls' section, there is a supervisor who reports directly to the head of girls' section. Whereas in the boys' section, there are 2 different supervisors: the first is responsible for grades 9 and 10 and the second for grades 11 and 12. These 2 supervisors have direct reporting to the head of boys' section.

Every teacher and student in the school are equipped with a laptop. All school laptops are connected to the same network. The students' laptops work on a unified software for education called *FROGOS*. There are interactive whiteboards in every classroom from KG1 to grade 3. As for grade 4 and upwards, there are LCD projectors in every classroom. Three technicians are employed within the school and their job is to provide maintenance and support for teachers and students in every issue related to digital technology. One technician is responsible for maintaining the software *FROGOS*; however, he is employed by an external company.

Twelve teachers employed in the school acted as the main source of data for this empirical study. Each teacher underwent three classroom observations and one interview. Add to that, there were light observations of the students in the classrooms. Three interviews were also conducted with the first principle and the heads of two of the sections. Finally, this empirical study included an interview with the coordinator of technicians.

3.2. Data Collection Methods

Due to the nature of the research questions which cares about qualitative aspects of the situation as much as it does account for the quantitative ones, we employed a variety of research

and data collection tools which would allow us to gain a holistic view on the problem under investigation. These tools included interviews, specific class observations, and general school observations, further explained in what follows. The data recorded as a result of each of these methods will be compared in later sections to draw a full picture of the situation.

A total of 16 staff members from the school, including teachers, principals, and technicians, participated in the study. The sample was picked using a mix of purposive and random sampling, to represent the educational stages we are concerned about—grades 9 to 12. In other words, teachers were chosen to represent all classes belonging to the stage of this investigation. Additionally, they were chosen to represent various subjects, but not all, due to the restricted size of the sample. All interviews and observations data were collected by the researcher. Note-taking was the first step of the data collection process, whether during interviews or in parallel with observations. Then, notes were transcribed and digitalized.

Interviews

Interviews allow the research to break down a subject's perception on a certain issue better than most other tools (Madden, 2013). That is by giving participants the option to give subjective answers to questions. Moreover, the importance of interviews lies in their suitability to gather answers for questions investigating the “how” and the “why” of phenomena. As such, although interviewers usually prepare a set of specific questions, the data collected from interviews can, most of the time, be placed into the wider research context by bringing a comprehensive understanding of this context.

A total of 16 interviews targeting 12 teachers, 3 principles, and 1 technician, and spanning from 20 to 30 minutes were conducted. These were carried out in English and took place inside the school. Since English is the official language of the school, the researcher did not face any

problems in holding the interviews in it. Although some grammatical and structural mistakes were recorded, subjects felt comfortable expressing themselves during the interviews and could clearly communicate all inputs they had on the topics discussed. The tone and approach of holding the interviews swapped between formal and informal depending on the nature of interaction that occurred with the interviewee and their respective responsiveness with the interviewer. The same set of questions was used with all interviewees (see appendix A). The interview was split in two parts. The first part of the interview aimed at addressing the teachers' perspectives on teaching in general. Sixteen questions were chosen from Goodyear and Allchin (1998) and Kenny (2008). The questions in this part of the interview were used qualitatively. The second part of the interview was based on Ventakesh, et al. (2003) and Ventakesh, Thong, and XU (2012). This part focused on the teachers' attitudes towards the use of digital technologies in their everyday teaching practices. Eighteen questions were used in this part of the interview. These latter took a quantitative approach and spanned the following 5 elements: performance, efforts, social influence, facilities, autonomy. These factors were specifically set to answer the research questions and account for potential extraneous variables. Moreover, the questions were generally open-ended, allowing the participants to voice out their opinions on digital technology and provide their perspectives on the related issues, even when not directly asked about them.

Specific Observations

Observations are a necessary tool for Education-related research, as it allows the researcher to observe the interactions and dynamics as they usually and normally occur within educational institutions (Hammersley, 2006). Although observations are always accompanied by the difficulty of discerning subjects' actions, they can be made easier when directed towards specific subjects (Mörtberg, et al., 2010). That is, when a researcher follows certain participants over many

observations, their interpretations of movements and actions will be more accurate, reasonable, and contextualized.

Therefore, such observations are the second main data collection tool employed in this research. The type of observation that this section is concerned about, specific observation, was held inside the classes and aimed to assess certain teachers' attitudes towards and use of digital technologies inside their classes. The questions generally investigate whether a teacher employs digital technology in various components of his/ her classes, and how well he/ she does it. A total of 36 class observations equally targeting 12 teachers were conducted. Three observations were held for each teacher, and that is with the aim of eliminating subject bias and detecting it where it occurs.

General Observations

The interactions between individuals, staff, and students in the school extend beyond the classroom setting and can take informal as well as formal aspects (Ogbu, 1981). To account for all interactions and doings, we held general observations of the whole school environment, in the field, offices, and meeting rooms. No specific visits were made to the school to hold these general observations. Instead, questions were answered, and notes were taken as part of the researcher's regular visits to the school for interviews and classroom observations, and whenever a significant indicator became clear. The questions that we tried to answer through these observations were centered around the abundance and use of digital technologies inside the school.

3.3. Analysis and Treatment of Information

The mixed-methods approach implies that we will be looking at data from both a qualitative perspective and a quantitative one. The qualitative part relies on interpretative analyses. From these analyses, a holistic understanding of the views, perspectives, and actions of the subjects

is drawn, and, in turn, is coded into quantitative data pertaining to specific frameworks relevant to the research questions.

First, the interviews and observations data were read thoroughly for a holistic understanding of the school's context and the teachers' actions and attitudes to be gained. Then, the data set resulting from interviews and observations was summarized in the *Findings* section. That allows us to categorize the data and place it within certain frameworks that are relevant to the questions, which are: (1) an assessment of the subjects' prior experience with digital technologies; (2) an assessment of the teaching philosophies of subjects; (3) an evaluation of the subjects' attitudes towards digital technologies; and (4) an assessment of the school's equipment and preparations for the introduction of digital technologies. Finally, relations and connections between these various frameworks are drawn to evaluate the hypotheses. The content analysis method, which categorizes qualitative data based on a certain theory, will be followed throughout.

Quantitatively, the data is mostly interpreted using descriptive statistics. Nominal measurements scales are largely employed to classify data, though some data which indicate subjects' ratings of certain measures necessitate the use of an ordinal scale. Some basic inferential statistics are employed to infer from the data collected for this multi-variate research. Finally, certain relationships between the variables is deduced.

3.4. Research Design and Rationale

As explained previously, this dissertation follows a mixed-methods approach that accounts for qualitative aspects as well as quantitative ones, which enables us to gain a whole-picture view of the situation. Moreover, a one-school approach is taken to prevent further sophisticating the situation and to eliminate certain geographical, socio-economic, and political factors which cannot be accounted for through the scheme of this research. Several factors have impacted our choice of

the school. The school had to be a large one, so that it can provide enough subjects for the sample, one that employs technology to a certain extent, and the administration has to have some openness to research and collaboration with researchers. The choice of approach and methods was based on the following two main factors:

3.4.1. The Research Questions

As stated previously, the questions of this research do not inquire about the usefulness of digital technologies in educational settings; rather, they look for the position of educators from the introduction of such technologies. Mainly, we aim to reveal *what* impacts diverse positions towards them. Such questions cannot have one simple answer to them, as the attitudes investigated vary, and so do the reasons behind them. This is especially the case in the UAE, due to the lack of research on the factors impacting the reception of digital technology among educators, and its centralization on higher education (Abdalla 2007). Moreover, it is expected that the attitudes investigated will greatly vary, as the perception among researchers is that hurdles against the smooth introduction of digital technology into education are greatest in rapidly developing countries, like the UAE (Iyamu & Aduwa Ogiegbaen 2005).

As such, it was important to create and use a variety of data collection and analysis tools which would account for the various answers that the chosen open-ended researcher questions may have. A multi-methods approach would be the only way to draw a full picture of the situation under investigation. However, resources and time restrictions led us to limit the scale of this investigation, which would cover only one-school. This approach allows us to fully grasp all possible observations and data and contextualized them within the school's context which has been extensively observed and examined.

3.4.2. Existing Literature

The mixed-methods, one-school approach was also inspired by the literature which was reviewed in preparation for this dissertation. There is no doubt that single-methods research cannot be wholesome in investigating complex organizations such as schools (Randall, Harper & Rouncefield, 2007). In fact, most education-related research employs an approach that combines methods and involves qualitative as well as quantitative analyses (Pole & Morrison, 2003).

Blomberg, Burrell and Guest (2002) view that when the research pertains to complex educational organizations, researchers cannot use their experiences as the source of data. Rather, the experiences of those affected by these organizations are what should be investigated. Such experiences are often impacted by a variety of factors, including political, economic, and social elements, especially in the field of education. Therefore, these experiences and factors can be accounted for by descriptive data, often obtained through diverse methods that serve theoretical as well practical aims (Ogbu, 1981).

Focusing this investigation on one school while employing various data collection methods and using interpretative tools to investigate the collected data ensures the sensitivity of this research to context, culture, and subjects. This sensitivity is crucial to research in education, as it eventually leads to the achievement of reforms in this field (Zaharlick, 1992). That is by establishing the relationships between various parts of the educational institution and allowing the research to gain a whole, multi-perspective view of it.

3.5. Evaluations and Limitations

In previous sections, the research methods of this dissertation and their relevance to Education research, and this research's questions in specific, have been extensively described and

explained. Despite the fitness that has been created between the context of this research and the approach employed in it, there are several limitations to this approach and its underlying methods. These include limitations to the reliability, validity, and generalizability of this research, which will be elaborated on in what follows.

First, this research owns limited reliability due to various factors. The fact that the data collection processes were all performed by one person limits the consistency of results and suppresses the ability to measure interrater reliability, eventually preventing this research from validating and confirming the available data. However, reliability across time can be established since the data collection was performed over several weeks. Lastly, the internal reliability of this data, meaning the consistency across items, can be measured thanks to the employment of multiple data collection methods, namely, interviews and general and specific observations.

The second limitation pertains to the nature of data collection methods which may involve certain variations and alterations of the data during the process, subsequently impacting validity measures. This is largely the case for observations, which, according to Mörtberg et al. (2010), allow a researcher to “see” phenomena, but not necessarily understand and interpret them correctly. Three observations approaches have identified by researchers: (1) total participation, where none of the participants is aware of the researcher’s role as an observer, (2) participation in normal settings, where certain subjects are aware of the researcher’s role, and (3) participation as an observer, where the role of the researcher is open to all subjects (Pole and Morrison, 2003). The methods align with the third approach, which has its advantages as well as disadvantages. The advantages include allowing the researcher to get a closer look at the situation in hands, and observe minimal details in it, as the consent is obtained from subjects. As for the disadvantages, they include the possibility of deliberate or unintentional alterations to phenomena

by the subjects, preventing the researcher from observing them as they naturally and normally occur in their settings. It is expected that, if encountered, this issue will be reduced as we progress through the observations, since a certain relation will have developed between the researcher and the subjects, allowing them to reduce their worries and anxiousness during observations.

Finally, this research enjoys limited generalizability due to many reasons. School settings are very complex and are impacted by a multitude of factors, which make it impossible to equate schools across countries, regions, and socio-economic contexts. Therefore, the employment of the one-school approach makes it ineffective to generalize all the results of this research to other educational settings in the UAE. In other words, this dissertation may allow to draw conclusions about factors that impact teacher's attitudes toward digital technologies. Yet, the concluded attitudes may not apply to other educational institutions, which may be impacted by other political, economic, and social agents regulating such perceptions and views. Similarly, the limited sample which only includes 16 participants representing grades 9 to 12 make it ineffective to deduce the results' representativeness of the whole school.

3.6. Ethical Considerations

Consent was obtained verbally and formally, through email communications, from all interviewed and observed parties. Also, the school's approval to conduct the study was obtained formally from the management. In addition, to ensure the autonomy of subjects in participating in this research, they were required to provide consent. It is noteworthy that prior to taking their consent, subjects were informed that they have the full freedom in choosing whether to participate, and that they can drop out of this study at any point. Finally, to ensure the confidentiality and anonymity of research respondents, no videos, pictures, or recordings were made as part of the data collection process.

Chapter 4

FINDINGS

4.1. General Observations

This section presents valuable contextual information on the school and its employment of digital technology, collected during the general observations process which took place during the regular visits and meetings made to the school by the researcher. Not all the questions originally included in this observation tools' questions were answered, and that is due to being inapplicable. For instance, it was not noted whether the school recognizes teachers who have won awards in the use of digital technology, since none are present in the sample.

As noted during these visits, teaching is only of the many activities that teachers engage in inside the school. Class preparations, meetings, advising sessions, breaks, and other events occur regularly. Although there is no specific timeframes for these activities, they may take just as much time as teachers invest in teaching, or even more. Discussions about digital technology may occur during these activities but are not as frequent. It should be noted that such discussions are particularly salient between teachers and their parallels giving similar subjects or using similar methods and digital technology tools. That occurs as a trial to share experiences and learn from one another.

As for the school's structure, there exists two large staff rooms, one for male teachers and another for female teachers. Each staff member has his/ her own desk that is separate from others'. Furthermore, teachers are given portable computers by the school upon starting their work, which they are expected to use while preparing and giving classes and performing other tasks. In the classes, upper grades in specific, each student has their own L-shaped desk. Smartboards are

available in classes from kindergarten to grade 3. As for upper grades, each class is equipped with iPads and projectors. Additionally, students in these classes use their laptops to take notes and participate in other class-related activities. Internet is available to students and staff throughout the school.

As noted during our visits and data collection process, teachers do receive trainings in digital technology. However, those trainings are not formalized nor well-organized based on the teaching level, subject, or the teachers' needs. The amount and quality of training received differs for each staff member.

4.2. Interviews

4.2.1. Part I

Part I of the interviews involves qualitative data obtained through the discussions held with the teachers on their philosophy of teaching and learning and education processes. Although all subjects participated in the interviews, some did not answer all the questions. In most cases, that occurred due to the lack of time, which led the researcher to prioritize the most relevant questions over others.

Subject (1) employs a student-centered approach using hands-on audio-visual components to produce concrete experiences. They employ The Flipped Classroom Model, which involves encouraging students to prepare for the lesson before class. They consider organization, enthusiasm, patience, respect for others, subject knowledge and a well-developed sense of humor, to be essential components of effective education.

Subject (2) uses the modern and traditional teaching simultaneously and focuses on hands-on activities and practical work to motivate and engage students. They consider differentiation

between students of diverse backgrounds and with different needs, flexibility and openness to continuous learning to be what makes an effective teacher.

Subject (3) has a demonstrator style which gives the teacher opportunities to incorporate a variety of formats. Cooperative learning, Differentiation, and Inquiry-based learning are among their teaching strategies. Among their most challenging tasks is integrating curriculum with technology, in addition to the lack of time to converse about, plan and research this integration.

Subject (4) describes their teaching style as multidisciplinary. Constant learning, awareness of the students' culture, and creative delivery are what makes them an effective teacher. Through teaching, they try to stretch students' minds to new ideas and skills to be used later on in their professional lives.

Subject (5) applies a collaborative, student-centered style and plans accordingly. They act as a facilitator to promote self-learning among students. According to them, continuous self-development and the ability to spot and handle differences between students and adapt to the learning environment are what makes an effective teacher. They keep themselves up-to-date with new trends, information or advancements in their subject area.

Subject (6)'s teaching style is student-centered, project-based, and includes active learning. Engaging students in learning, dedication to teaching, experience in teaching methodologies, and patience are what makes an effective teacher for them. They continuously learn about their subject area to gain more experience and knowledge.

Subject (7) tries to equip their students with 21st century skills, which deal with the "how" of things and phenomena rather than the "where" and "what". They perceive Integrity and Differentiation to be essential qualities of an effective teacher. The subject believes a teacher must be a perpetual student.

Subject (8) adopts a group-work-based, student-centered approach that makes learning outcomes productive and accessible for all students. According to this subject, using real-life examples and sparking creativity is what makes an effective teacher. They keep learning about their subject area with the aim of producing a generation that can easily adapt to the society.

Subject (9) adopts an activity style that promotes engagement, self-learning, and critical thinking. On the one hand, the subject does not learn constantly about their subject area and encourages a specific routine in class. On the other hand, they stimulate student's curiosity and critical thinking to create innovation in them.

Subject (10) considers himself as a facilitator in the classroom, who promotes active learning and student engagement. According to them, a teacher can be effective by planning and adapting teaching to the students' needs. The subject continues to learn in their area, aiming to build responsible and participatory future citizens.

Subject (11) doesn't follow a single teaching style, rather adapts their methods to the needs and the nature of their students. In general, their style is cooperative, encourages questioning, and attempts to deliver information quickly while differentiating between students. The subject perceives that learning on delivery methodologies must be ongoing, and so should the knowledge of learners' psychology.

Subject (12) uses different teaching strategies, including online resources and visual aids. The subject keeps herself updated in her area to account for generation differences and uses diverse communication methods to move the students away from boredom.

Subject (13) teaching style is very interactive and incorporates new strategies, like technology, to motivate students and make their learning experience more fun. Positive attitudes, cooperative

work, and openness to continuous learning and discussions that encourage critical thinking is what makes an effective teacher for the subject.

Subjects (14) relies on explaining concepts, discussions, and visualizing ideas for students to reach a full understanding of them. The subject still learns about their field to get new and different perspectives on it, and to be able to reach students at different levels.

Subject (15) teaching style is modern, interactive, and student-centered and it encourages competition between students. According to him, the ultimate learning environment is one that involves collaboration between curriculum makers, teachers, management and students. Through patience, team work, creativity, and innovation, the subject tries to impact the social and behavior level of his students. The subject keeps himself updated to be able to address today's student needs.

Subject (16) uses new methodologies integrating technology, lecturing, and inquiry-based learning. He perceives that being up-to-date, understanding students' needs, regularly changing the teaching style to engage students, and having good class management skills is what makes an effective teacher.

The following tables summarize the findings of Part I of the interviews. Throughout the interviews, teachers emphasized certain qualities as essential to effective teachers. Ethics, patience, and respect came on top of these qualities with 43.75% of teachers mentioning them (Table 1).

	Frequency	Percentage
Class and time management skills	4	25
Good subject knowledge	5	31.25
Effective work habits and planning	3	18.75
Ethics, patience, and respect	7	43.75

Ability to spot differences between students and adapt lessons to them	5	31.25
Commitment to teaching and learning	4	25
Creating a learning environment	3	18.75
Ability to engage students	3	18.75
Friendly and flexible personality	5	31.25
Knowledge of teaching methodologies	2	12.5
Stimulating critical thinking	1	6.25

Table 1: Qualities and characteristics that subjects cited as crucial for an effective teacher

Additionally, teachers mentioned certain qualities as essential to an effective learning environment. Ensuring students' comfort, engagement, and openness to their questions came as the most important factor, as emphasized by 68.75% of teachers (Table 2).

	Frequency	Percentage
Ensuring students' comfort, engagement, and inquisitiveness	11	68.75
Involving time-management	2	12.5
Safe and spacious	5	31.25
Cooperation on learner-learner, learner-educator, and educator-educator levels	4	25
Involving multiple learning models and tools	5	31.25
Involving differentiation between students with different backgrounds	1	6.25

Involving minimal stress for educators and learners	2	12.5
Creativity-sparking	2	12.5

Table 2: Characteristics that subjects cited as crucial for an effective learning environment

Moreover, subjects mentioned certain strengthens as ones they have in teaching. Creative delivery was the most frequently mentioned quality, as seen in Table 3.

	Frequency	Percentage
Good subject knowledge	5	31.25
Class management skills	6	37.5
Friendly personality	2	12.5
Good ethics, patience, and respect	4	25
Enthusiasm and dedication to teaching	4	25
Creative delivery	8	50
Social skills and Sense of humor	6	37.5
Emotional intelligence	3	18.75

Table 3: Skills and strengths that teachers claimed to have in teaching

Table 4 shows that the vast majority of subjects-- 93.75%, still learn about their subject areas. Moreover, all subjects claimed that they think of teaching as a rewarding profession. Some subjects went to describe those rewards, specifying that they lie in the moral value rather than financial ones. Other teachers mentioned that the rewards are with students returning to their societies and communities in the form of successful young leaders and learners.

		Yes	No
Do you think that teaching is rewarding for educators	Frequency	16	0
	Percentage	100	0
Do you still learn about your subject area	Frequency	15	1
	Percentage	93.75	6.25

Table 4: Teachers' perceptions on how rewarding teaching is, and their behaviors related to continuous learning on their subject areas

Finally, teachers mentioned the tasks that they find to be challenging in education. Those included motivating teamwork and empathy among students and differentiating between students with different backgrounds.

	Frequency	Percentage
Integrating curriculum with technology	1	6.25
Lack of time for planning and research/tight schedule	2	12.5
Teaching different levels simultaneously	1	6.25
Motivating teamwork and empathy among students	7	43.75
Undertaking many roles in the school	1	6.25
Differentiating between students with different backgrounds	7	43.75
Assessment and evaluations	1	6.25
Class management	1	6.25
Delivering scientific ideas in a simplified matter	1	6.25

Table 5: Challenges teachers face in their jobs

4.2.2. Part II

The second part of this section presents the data concerned about attitudes, beliefs, and views that subjects had on the use of digital technology in Education, generally as well as specifically, as it is employed in the school. Moreover, subjects' behaviors in that matter, as reported by them in the interviews, are displayed. The data is presented quantitatively, mostly using descriptive statistics like frequencies and percentages. The five following themes related to the attitudes and the use of digital technology are explored: performance, effort, social influence, facilities, autonomy in using digital technology.

a) Performance

The first set of data discusses educators' general views on digital technology and its usefulness in Education. When asked about their preferred type of technology in class, 8 subjects claimed that they prefer using digital technology, which includes interactive digital platforms, smart pictures, and computers, in contrast to 2 who prefer traditional technologies, like white boards, paintings, and paper. A total of 6 educators claimed that they prefer using both in their classes (Figure 1). Subjects were also asked how rewarding they perceive digital technology use to be, and their answers came with less variance, as shown in Figure (2). Of the 16 educators interviewed, 14 stated that they perceive it to be rewarding, only 1 claimed that it is not, and 1 stated that it is somewhat rewarding.

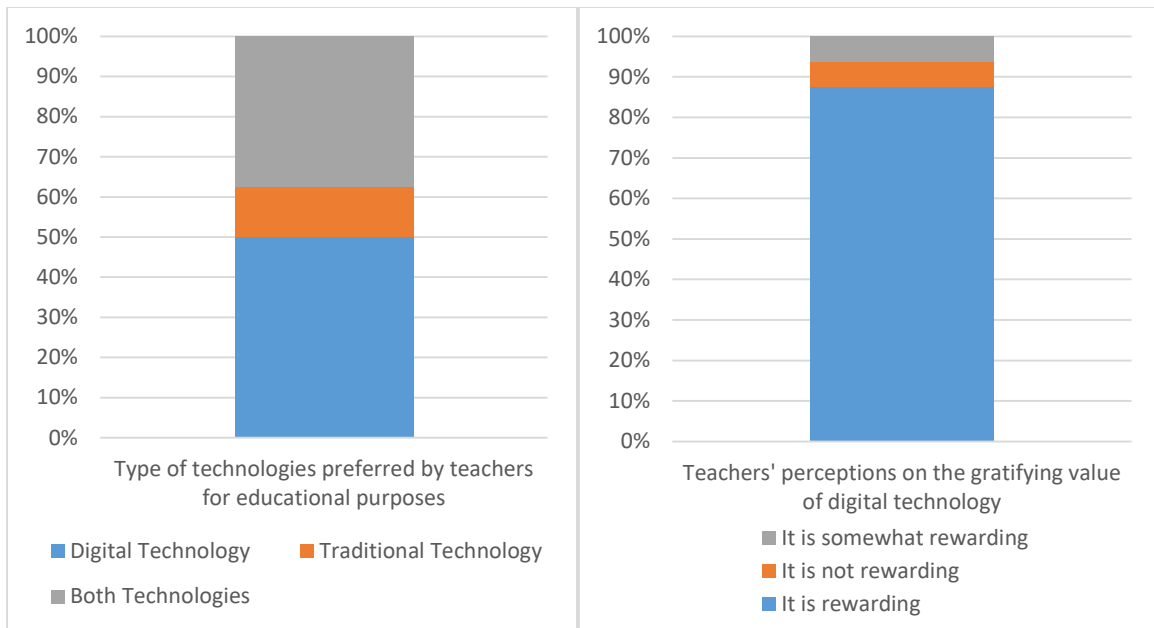


Figure 1: Teachers' preferences of digital technology and/or traditional technology

Figure 2: Teachers' views on the gratifying value of digital technology

The factors that lead teachers to adopt the above-mentioned stances and views on digital technology have also been investigated in this section. The qualities of efficiency and quality-production are each associated with digital technology by 12 teachers. As for time-saving and productivity, they were emphasized by 8 teachers as main benefits of the employment of digital technology in Education (Figure 3).

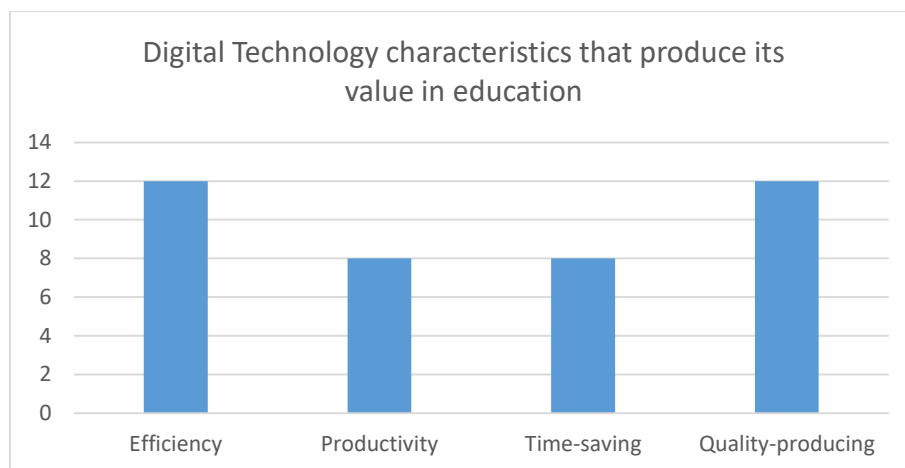


Figure 3: The various qualities that produce digital technology's benefits in education, as perceived by teachers

b) Efforts

The second set of data presents the efforts that educators stated they put into the employment of digital technology in their classes. As shown in figure 4, the vast majority of teachers claimed that the use of digital technology for educational purposes is easy, in contrast to only 3 who claimed the opposite. Figure 5 presents the amount of time that teachers needed to learn the process of employing digital technology in Education. More than 40% of subjects interviewed claimed that there is no specified time to learn how to employ digital technology in class, as this knowledge depends on the subject and continues to accumulate with experience and practice. Therefore, different teachers may have different needs in terms of learning it.

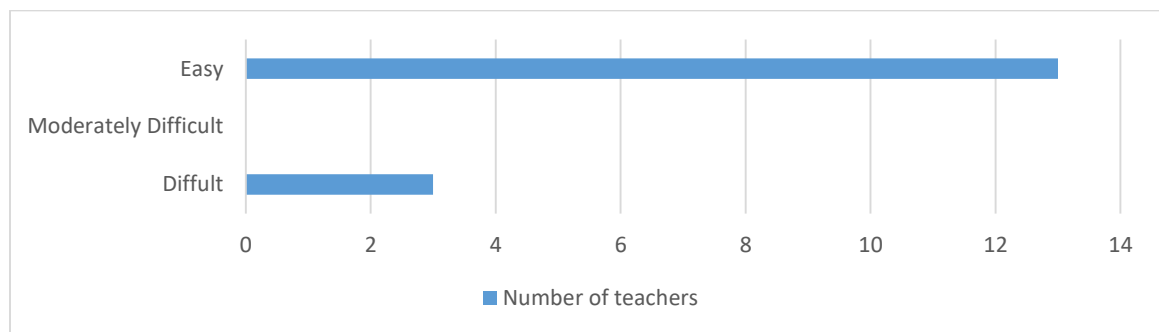


Figure 4: Number of teachers describing the use of digital technology in schools as easy, difficult, or moderately difficult

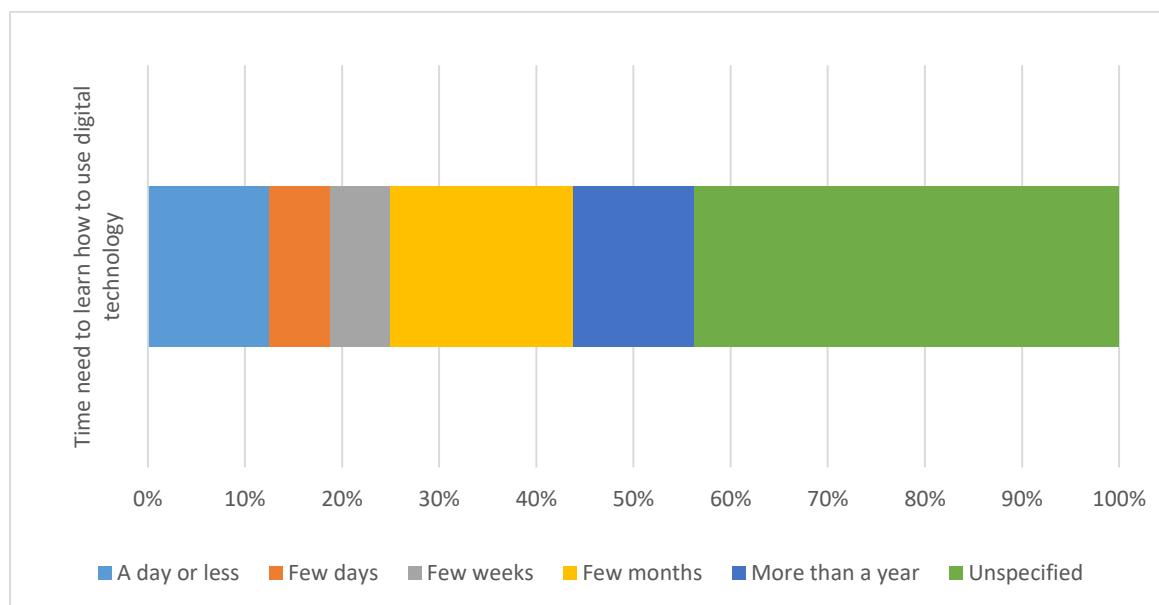


Figure 5: Teachers perceptions on the time needed to learn how to use digital technologies in education

Out of the 16 subjects interviewed, only 5 rated their skills in technology as 5, on a scale of 1 to 5. On the other hand, 56% rated their skills 4, and none rated them as 1 or 2 (Figure 6).

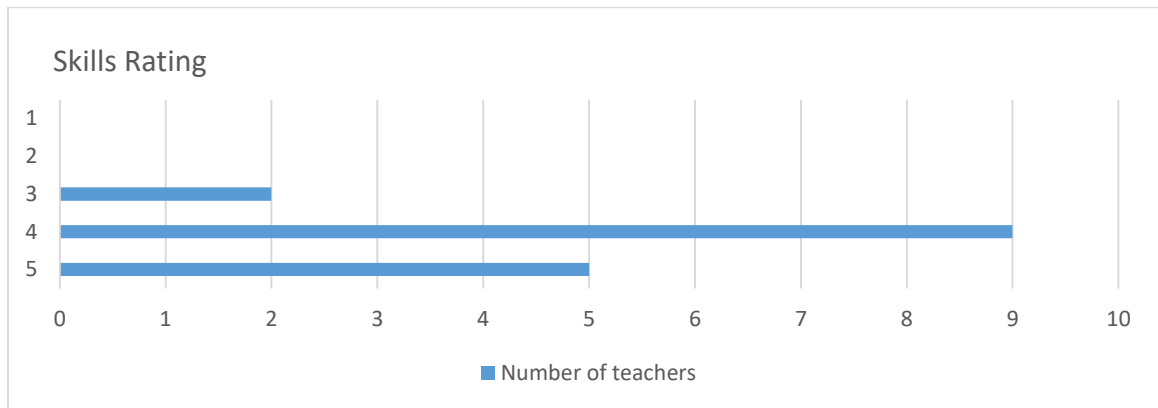


Figure 6: Teachers' own rating of digital technology skills on a scale of 1-5

Finally, teachers described the areas of their employment of digital technologies (Figure 7). Note that there is an overlap in this set of data, with many teachers marking more than one area.

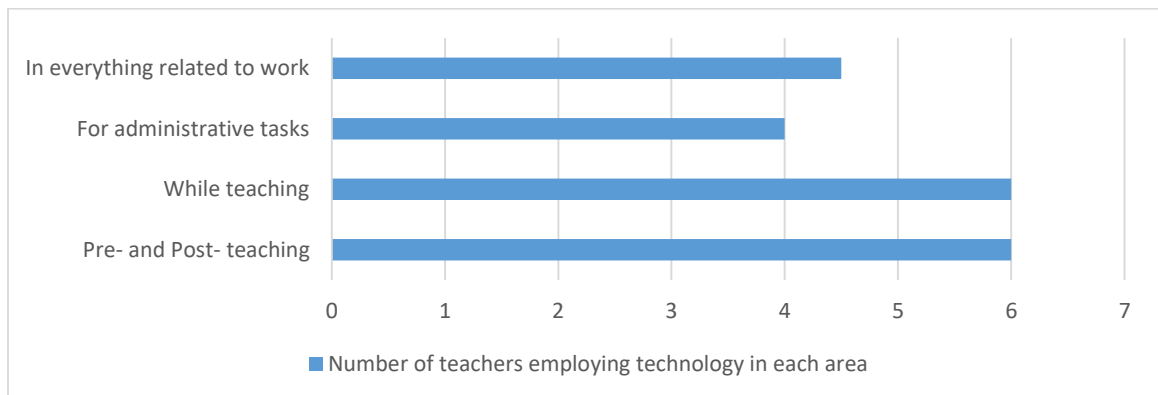


Figure 7: Areas and tasks in which teachers employ digital technology

c) Social Influence

In this section, teachers described the social factors that impact their use of digital technology, as shown in Figure 8. The vast majority of teachers—12 subjects, perceived this impact to come from their own identity (Figure 9). On the other hand, 2 claimed that the use of digital technology is not related to the teacher's identity.

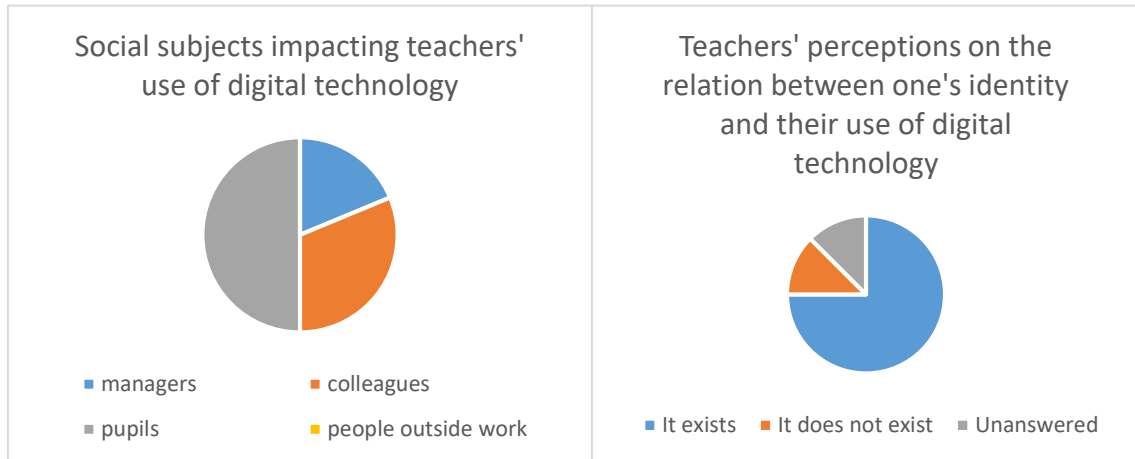


Figure 8: The social subjects impacting teachers' use of digital technology

Figure 9: Teachers' perceptions on the relation between their identities and their use of digital technology

d) Facilities

The relation between digital technology facilities, Education components, and performance is discussed in this section. Only 37.5% of subjects viewed that the use of technology facilities significantly impacts their ways and methods of teaching (Table 6). Subjects cited various ways through which digital technology impacts their teaching strategies, with around 44% of them mentioning that it improves their performance. Additionally, 44% of them cited keeping themselves up-to-date with new platforms and means of technology-based Education as the main field in which they invest time.

	What impact does it have on performance	In what areas do you spend the most time using digital technology
--	-----------------------------------------	-------------------------------------------------------------------

	Does it determine the way you teach										
	yes	no	Improving performance	Employing student-centered strategies	Improving interactions	Developing 21 st century skills	Increasing Efficiency	Planning	Keeping oneself up-to-date with the newest platforms	Updating one's pedagogy and didactics	Learning how to use it
Response											
Frequency	6	10	7	2	1	1	4	6	7	3	1

Table 6: Teachers' perceptions on the relation between digital technology facilities and their performance in education

Data on the availability of digital technology resources in the school was also investigated and is displayed in figure 10. It can be said that teachers' views on this matter are evenly split, with 8 inputs asserting that the resources are available, and 8 claiming that they are either unavailable or partially available. This distribution can inform us of the variability among educators when it comes to their definitions of digital technology and its resources. Finally, 81% of respondents asserted that digital technology facilities and tools are compatible with their education-related needs (see fig. 10).

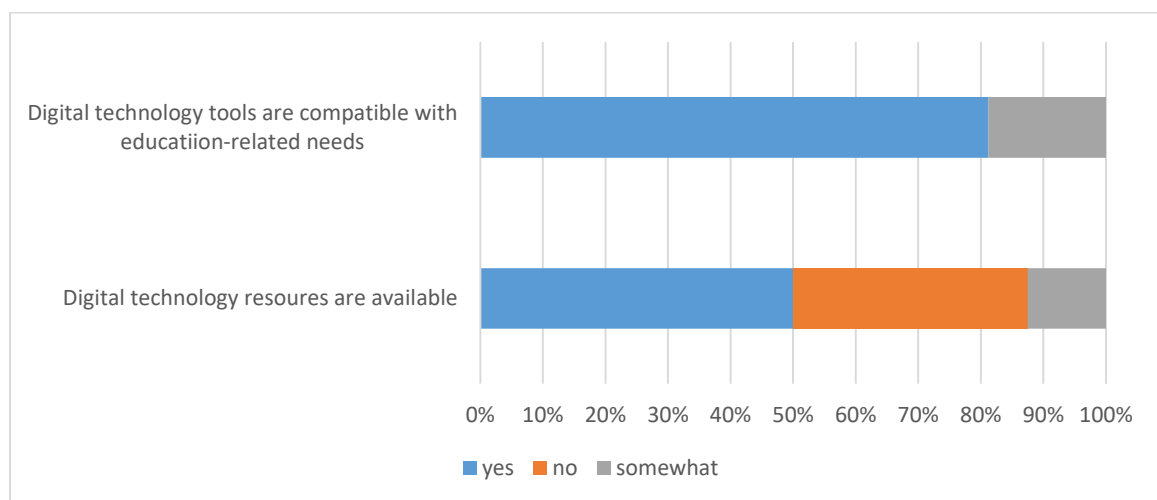


Figure 10: Teachers' perceptions on the availability of digital technology resources, and their compatibility with education needs

The final part of this data is concerned about the amount of autonomy that educators have in employing digital technology in education. 87.5% of teachers claimed that they have an obligation to use digital technology in their classes, with the vast majority of them asserting that this obligation comes from the administrative body. One respondent claimed that they have the freedom whether to use it or not, and one claimed that there is some sort of obligation. This data, again, asserts the lack of agreement between teachers on the meaning and significance of digital technology. Moreover, 56% of respondents stated that they do not use digital technology more than requested.

4.3. Specific observations

This part adopts a quantitative perspective to tackle teachers' technology-related behaviors in the school. The data presented in this section were collected through direct specific observations performed by the researcher inside the classes of 12 teachers. Three observations were held for each subject, totaling up to 36 observations. Despite the fact that this 3-observations approach was employed to minimize subject biases, it cannot be ensured that such biases were totally eliminated.

All subjects observed made use of the projectors and their interactivity, as required by the school for the specific level targeted, in addition to using white boards occasionally and as needed. For 2 teachers, the laptop frequently went into sleeping mode. However, this was not perceived as an issue since the teacher performed other tasks meanwhile, like using the whiteboard or holding discussions. Six teachers mirrored everything on their laptops, including emails and administrative documents, into the projector. Only in 2 observations, the teacher struggled to start the projector; however, the problem turned out to be technical.

Generally, all teachers could work on their computers while connected to the white boards. However, there was a range of how smooth and productive that process was among different

teachers. All teachers had planned their lessons in advance, and that was detected through their use of PowerPoint presentations. Nevertheless, only 3 teachers went beyond that to use online exercises and more complex digital components. As for exams, they were conducted using digital platforms for 8 teachers and using paper for the other 4 subjects. The engagement level of students greatly varied from teacher to teacher and from session to session.

Finally, there were enough outlets in the classrooms for students and teachers to plug their digital devices. Additionally, there are specific guidelines and resources for teachers to use when facing technical problems. However, since that did not occur in any of our observations, it could not be detected how efficient these services are.

This chapter presented the collected data in details. That ranged from qualitative data that discusses teachers' philosophies of Education to quantitative data that showcases their dedication to the use of digital technology. These data will be grouped within certain patterns in the following chapter in order to answer the research questions comprehensively and assess the hypotheses.

Chapter 5

DISCUSSION AND ANALYSIS

In previous chapters, subjects' accounts of and perceptions on the use of digital technology in Education have been thoroughly discussed and established. That data presents the building blocks to the answers of our questions which pertain to the impact of technology's introduction to Education on teachers. This section interprets these data, creates patterns among them, and reaches certain conclusions based on them. A hypothesis-based interpretation will be followed throughout this section. Each hypothesis will be stated along with analyses of the relevant data and a conclusion either accepting the relevant hypothesis or rejecting it.

5.1. Hypothesis 1

Hypothesis: Teachers attitudes toward the integration of digital technologies into Education are significantly impacted by their previous experiences with such technologies.

Analysis: Multiple recorded data patterns are relevant to this first theme. During the interviews, over 87% of teachers claimed that they perceive the use of digital technology to be rewarding. Teachers further elaborated on those statements explaining the rationales behind those perceptions. Some subjects viewed digital technology to provide students with 21st century skills, while others emphasized the efficiency of using it as well as its ability to improve educators' performance. Additionally, 81% of them stated that they perceived this use to be generally easy and uncomplicated. Finally, 87.5% of all interviewed subjects rated themselves 4 or above on a scale of 5 in the skills of digital technology. As noted during the specific observations, all teachers used digital technology in their classes, including projectors and online tools like presentations and PowerPoint lessons. Therefore, our research has shown that this school's subjects who

perceive digital technology use in Education to be rewarding based on their experiences with it, actually employ it in their classes and have generally positive attitudes towards it.

This hypothesis can also be tested quantitatively. The first variable of the equation, teacher's attitudes towards the use of digital technology in Education will be assessed based on the subjects answer to the question on the compatibility between digital technology and the everyday work of teachers. The second variable, teachers' previous experiences with digital technology will be assessed based on their own ratings of digital technology skills. A Chi-square test (X^2) will be employed to test the correlation between these two variables. Table 7 and Table 8 below present the observed and expected frequencies of each of these variables.

	Technology Skills Likert Scale Ratings			
Views on Tech-Education compatibility	3	4	5	Total
Compatible	0	8	5	13
Incompatible	2	1	0	3
Total	2	9	5	16

Table 7: The observed frequencies of Technology Skills Scale Ratings and Views on Tech-Education compatibility

	Technology Skills Likert Scale Ratings			
Views on Tech-Education compatibility	3	4	5	Total
Compatible	1.625	7.3125	4.0625	13
Incompatible	0.375	1.6875	2.8125	3
Total	2	9	5	16

Table 8: The expected frequencies of Technology Skills Scale Ratings and Views on Tech-Education compatibility

The degrees of freedom are 2, calculated based on the number of categories.

Using the Chi-Square Formula,

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

Where:

χ^2 = Chi Square obtained

\sum = the sum of

O = observed score

E = expected score

We were able to obtain the value of χ^2 as 12.040238. On the Chi-Square Distribution Table (see Appendix B), this value falls between 9.210 and 13.816 corresponding to probability values 0.01 and 0.001, respectively and degree of freedom $df=2$. Therefore, the p-value of this test is lower than 0.05, allowing us to reject the null hypothesis and accept a correlation between the two variables: Teachers previous experiences in digital technology and their attitudes towards these technologies. As such, the first hypothesis of this research is accepted.

5.2. Hypothesis 2:

Hypothesis: Teachers with prior positive experience with digital technologies perceive their occupational functions to be complex.

Analysis: It has been previously established that the vast majority of this study's sample appreciates the use of digital technology in Education. Around 81% of them mentioned that they perceive this use to be somewhat easy. This signifies that interviewed teachers have mostly had positive experiences in this field. In the data collection process, 100% of teachers used a variety of complex words to describe their functions as teachers, especially during the first part of the interviews. These descriptions included the following terms and functions: differentiation, practical work, real-life examples, cooperative learning, openness, continuous learning, etc.

Despite the agreement that seemed to exist between all our subjects on the complexity of educational and teaching functions, this hypothesis still cannot be accepted. That is due to the fact that even the subjects who have given themselves average ratings on digital technology skills used complex characteristics to describe their Education-related functions. In other words, there is no observable difference in subjects' perceptions of occupational functions in Education based on their previous experiences with digital technology. As such, based on our sample, it cannot be said that a teacher's perception of the complexity of educational functions is correlated with their previous experiences with digital technology. Hypothesis 2 is therefore rejected.

5.3. Hypothesis 3:

Hypothesis: Teachers with prior positive experience with digital technologies perceive learning processes to be complex and evolving.

Analysis: Due to the mixed nature of this research, which includes qualitative as well as quantitative approaches, not all data originally anticipated was actually obtained. Teachers did not elaborate enough on their perceptions of learning processes during the interviews, preventing this research from testing hypotheses related to this theme. As such, this hypothesis could not be tested.

5.4. Hypothesis 4:

Hypothesis: Teachers with prior positive experience with digital technologies perceive these technologies to be closely related to their identities as teachers.

Analysis: Around 85% percent of respondents stated that a teachers' use of digital technology in Education is closely related to their identities as teachers. It is noteworthy that this question had only an 87.5% response rate. Some subjects elaborated on their answers, stressing how relevant technology is to Education in a world that is governed and run by technology. Some teachers viewed that since students are immersed in the use of technology, teachers' incorporation

of it in education reflects their flexibility and appreciation of learners' needs. For many subjects, a teacher who prioritizes efficiency and facilitation is the one who uses digital technology. Finally, many subjects stated that technology use is related to teachers' identity due to the fact that its tools may extend or enhance their users' abilities, allow users to create new ways of dealing with tasks, or even change the very nature of the activities. On the other hand, respondents who did not perceive digital technology to be related to teacher's identity stressed that technology is just an additional tool for the teaching process, rather than a necessity. One subject viewed that relating his use of digital technology to his identity is an underestimation of his abilities, skills, and experiences.

Both subjects who rejected this relation rated themselves as 5 out of 5 on the skills of using digital technology. The ratings of subjects who accepted the above-mentioned relation varied. Qualitatively, and based on the general and specific observations which show that even respondents who did not correlate their identity to their use of digital technology still had good experiences and appreciation of such technology, this hypothesis is false. Hypothesis 4 is therefore rejected.

5.5. Hypothesis 5:

Hypothesis: There is a perception that the lack of high-level coordination between authorities and school personnel raises the complexity of the use of digital technologies.

Analysis: Questions on this theme were not directly included in the interviews, therefore cannot be assessed from a quantitative perspective. Nonetheless, the researcher noted all factors, events, and interactions during the observations, and which can allow us to answer this hypothesis qualitatively.

Coordination with authorities can take many forms and be observed through the availability of training and support for educators, rules, and policies. Moreover, this measure can be assessed through the amount of involvement of school management in educators' use of digital technology as well as the integration of digital technology tools into the curriculum. As for the complexity of using digital technology, it can be measured through the feasibility and smoothness with which teachers have operated their digital technology tools during the specific class observations.

Although it was clear that the management of the schools requires teachers to employ digital technology on a daily basis, the observation showed that their commitment to facilitate this use is minimal. That is due to several reasons. First, teachers' use of digital technology and time spent on preparing such tools for their classes greatly varied. Some educators stated that they use it less than required by the management. Second, different timeframes are taken by different teachers in preparation for such activities and that is due to the different backgrounds they have in technology. Although the management provides teachers with trainings in digital technology, these latter are not formalized and well organized based on the teaching level, subject, or the teachers' needs. That was emphasized by the subjects, and one respondent went further to ascertain that digital technology skills solely depend on personal efforts and trainings.

It also noteworthy that discussions about digital technology were not frequently noted and the coordination between staff members on digital technology matters were minimal. Moreover, the school hasn't integrated digital technology tools into its curriculum, and mainly expects such tools to be researched, found, and applied by teachers based on their subjects and needs.

As suggested by the hypothesis, the complexity of digital technology use as shown by respondents during the specific observations was moderate to high. Projector use was the only tool common to all classes. Out of all 12 subjects observed, only 3 used online exercises and complex

digital components. Additionally, 25% of teachers used paper-based exams. Further issues were observed in certain classes, like mirroring everything on the computer to the projector and letting the laptop go into sleeping mode.

Despite the possibility of many factors feeding into this situation, it can be said that the lack of management-level coordination and training contributes to the complexities observed in using digital technology by teachers. As such, this hypothesis will be accepted.

This section has answered most of our questions pertaining to what views teachers adopt on digital technology use in Education, and why they adopt those views. Generally, our answers and analyses came line in line with previous research, which has established the complexity of factors that influence teachers' reception of digital technology. Moreover, it stressed the importance of coordination and support in facilitating the introduction of digital technology into Education.

Chapter 6

CONCLUSION

This dissertation addressed the topic of integrating digital technology into education and the issues that come with this integration, particularly for teachers. Recently, a remarkable focus in Education research has been placed on technology. However, few studies have explored the multi-dimensionality of teachers' work, notably salient when using digital technology is made a requirement for them (Cuban, 2013; Graffiney, 2010). Due to the rapidly developing nature of the United Arab Emirates (UAE), researchers perceive this sophistication of technology-based education to be maximal for teachers, while contextual knowledge and research on this country's schools remain to be limited.

Since educators' ideologies and philosophies are a significant determining factor of an Education system' outcome and fruitfulness, this research adopted a mixed-methods, one-school approach to investigate the impact of the newly-introduced technology tools on the practices of teachers and their subsequent attitudes and behaviors towards these tools. The main questions that this study addresses are concerned about the way teachers conceive the integration of digital technology tools into the classroom in light of their teaching philosophies and ideologies, and what impacts they believe this integration entails.

Technology-Enhanced Learning systems involve many elements, including human beings, the systems' environment, technology tools employed, and the resources available (Kurti, 2009). From this sophistication arise many challenges to the successful flow of such systems. Salavati (2013) identified three main challenges domain: political, social, and resources. If these domains are not addressed comprehensively, Technology-Enhanced Learning can lead up to more negative

consequences than developments and prosperity in the field of Education (Salavati, 2013). One example of these challenges is the heavy workloads that schools tend to burden their teachers with, and which has been shown to prevent them from exploring digital technologies (Tallvid, 2014). The fast societal development has made this task even harder for teachers, who will need to compensate for the huge generation gap left by these developments to successfully integrate technologies into their classes (Skolverket, 2013b).

With the increasing importance and diversity that teachers' roles have recently adopted, their reception of and attitudes towards Technology-Enhanced Learning is increasingly significant (Jarvis, 2006). Researchers have noted that in different circumstances, teachers adopt a variety of perceptions toward the introduction of digital technology into Education (Skolinspektionen, 2011; 2012). For instance, one study has shown that teachers' attitudes toward digital technologies are significantly impacted by the type of involvement they have had in it (Venkatesh, et al., 2003). On the other hand, Tondeur, et al. (2008) linked teachers' attitudes toward technology to their general philosophies on Education. This research added that when the value brought by digital technology to the classes is minimal, teachers tend to discard its benefits and develop negative attitudes towards it.

As such, there exists a two-sided relationship between teachers' employment of digital technology and their attitudes towards it, with each side impacting the other (Tallvid, 2014). This research has explored this relationship and attempted to draw inferences about the introduction of digital technology to Education. Mainly, the links between the nature of teachers' prior experiences in digital technology and their respective views on their occupational functions as well the introduction of such technology tools to Education have been tested. Moreover, the impact of higher-level coordination on teachers' views of technology have also been explored.

This research was carried out in a school in the United Arab Emirates (UAE) that employs digital technology to a certain extent and has been focused on investigating the cases of grades 9 to 12. The sample consisted of 12 teachers, who participated in an interview and three classroom observations each, in addition to 3 interviews with principles and one interview with one IT technician.

Three different data collection methods were employed by one researcher: interviews, specific observations, and general observations. Although this diversity in data collection methods has allowed a multitude of perspectives to be considered in this research, the data collection process still has its limitations. Those include the fact that only one researcher has conducted the data collection process, which might allow certain biases to impact the results without being detected through tests such as interrater reliability. However, the strengths of the data collection approach lie in that it minimizes subject bias, by detecting the respondents through different lenses: their own, and the researcher's. This has produced a rich set of data which allowed the researcher to infer about the causes and consequences of subjects' involvement in digital technology use.

The analysis approach has its strengths and weaknesses as well. The use of a mixed-methods approach that involved quantitative as well as qualitative sides was useful by enriching the yielded data set and findings. In other words, instead of limiting the conclusions to certain links and associations, this research extended beyond that to present the feelings and attitudes of teachers in their own words and as experienced by them. On the other hand, this approach has limited the ability to test all hypotheses statistically and assess their correctness with confidence.

Indeed, the findings of this research were diverse due to its prolonged data collection process and its inclusion of quantitative as well as qualitative measures. A clear gap between the administration's policies which requires teachers to employ digital technology in their classes and

its efforts to make this use feasible and smooth has been noted during the general observation process. Although the school is well equipped with the material tools for digital technology, such as internet connection, laptops, and projectors, the didactics employed in it seem to lack technology as a principle element. In other words, the management has not yet integrated technology into its curricula, nor does it provide newly-coming teachers with formalized trainings on the use of technology.

The interviews have also led to significant and valuable findings. Most respondents interviewed seem to understand and value the complexity of their roles. Although some deliberately expressed their preference of using traditional technology, and others emphasized the hardships that come with using it, all teachers agreed on the multitude of benefits that are brought by using it. This indicates a general awareness among teachers on the importance of digital technology in their field, especially as dictated by our era and technology-fueled environment.

The first hypothesis in this research, stating that previous involvements of teachers in digital technology impact their perceptions of it, has been strongly accepted. This hypothesis was quantitatively approached and assessed. Using a Chi-Square test on the results of the interview, it was concluded that a link exists between teachers' self-ratings on the use of digital technology and their perception of its compatibility with education. As for the second hypothesis, which links teachers' prior experiences with digital technology with their perceptions on the complexity of their occupational functions, it was rejected. That is due to the fact that all respondents perceived their functions to be complex, regardless of how they rated their prior involvement with technology. The third hypothesis concerned with learning processes was not investigated due to the lack of efficient data on that matter. Hypothesis 4 was assessed qualitatively and was rejected. After the presentation of all the collected data on teachers' association of their own identities with

digital technology, it was concluded that this association is independent of teachers' prior involvement with digital technology, which contradicts what the hypothesis has stated. Finally, the fifth hypothesis was qualitatively assessed and accepted due to the perception of the lack of management-level coordination and the observed negative consequences of this experience on teachers. Teachers expressed the difficulties experienced while acquiring the skills of using digital technology and finding the right paths of integrating it into their classes, jobs that are meant to be accomplished by the administration.

Overall this research has contributed to the body of knowledge on Education and the phenomenon of digital technology introduction which has been abundantly investigated but less so on the teachers' level. By taking the case of a school in a rapidly developing country such as the United Arab Emirates (UAE), this research has shown the impact of unmanaged integration of technology into Education. Additionally, this research has established that teachers' perception of incompatibility between technology and education can be referred to prior negative experiences with technology. This is in congruence with prior research which has shown perceived efficiency and prior involvements to be significant determinants of teachers' attitudes towards and use of digital technology in classes (Salavati, 2013).

Nevertheless, and despite the many findings that research has come up with, more research is needed to establish reliability and validity and strengthen the evidence that we have detected. On the one hand, a qualitative assessment of teachers' prior experiences with digital technology can be helpful to identify the factors involved in their aversion from this use. On the other hand, a quantitative assessment of administrations' involvement in organizing the smooth and practical introduction of digital technology into education might be needed. Such research can revolutionize

the field of education by introducing new practices that school administrations will need to take on to prepare their students for this revolutionized world.

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APPENDICES

Appendix A: Questionnaire

Part 1: Philosophy of Teaching

The first part of the interview aimed at addressing the teachers' perspective on teaching in general. The questions were chosen from Goodyear and Allchin (1998) and Kenny (2008). The questions in this part of the interview were used qualitatively.

1. Why do you teach?
2. How can you describe your teaching style?
3. What are the teaching strategies you use the most? Why?
4. In your opinion, what are the basic standards/criteria of an effective teacher?
5. Do you think teaching has any rewards for teaching? What are these rewards?
6. How do you find your teaching different?
7. Based on what do you consider a learning environment as effective?
8. What are your skills and strengths in teaching?
9. What are the most challenging teaching tasks?
10. When was your proudest moment in teaching? When was your worst?
11. Do you still learn about your subject area? Why?
12. What are the outcomes of your teaching?
13. What is the kind of relationship you try to build with your students?
14. Which habits, methods and/or attitudes helped you in your most successful teaching moments?
15. Does your teaching really leave a positive impact in your students' lives? How?
16. Can you mention a quote/statement that you really like about teaching?

Part II: Attitude towards and Use of Digital Technology

The second part of the interview was based on Ventakesh, et al. (2003) and Ventakesh, Thong, and XU (2012). This part focused on the teachers' attitudes towards the use of digital technologies in their everyday teaching practices. The questions in this part of the interview were used in a quantitative manner.

I. Performance

1. How useful do you think technology is when you do your work?

- a. Productivity
- b. Efficiency
- 2. Overall, how supportive do you think the technology is when you do your work?
 - a. Time
 - b. Quality
- 3. Do you prefer traditional technology (White board paintings, paper, etc.) or digital technology (Interactive Digital / Smart pictures, computers, plates, etc.)?
- 4. Is the use of technology rewarding in any way?

II. Efforts

- 5. Do you consider the use of technology easy or difficult?
- 6. How long did it take you to learn how to use digital technology?
- 7. On a 5 degree scale how competent and skilled you would say you are on the use of technology, generally?
 - 1 = Not at all
 - 5 = Expert
- 8. Where and when do you use digital technology?
 - a. Pre- and post-teaching
 - b. During teaching
 - c. Administrative work
 - d. Everything related to work

III. Social Influence

- 9. Who are the people that affect your teaching practices the most and make you think that you should use technology?
 - a. Managers
 - b. Colleagues
 - c. Pupils
 - d. People outside your work
 - i. Who of these people would you say are important to you, and have an important impact on your role as a teacher?
- 10. Do you think the use of technology in teaching is closely related to your identity as a teacher? Why? /Why not?

IV. Facilities

11. To what extent does the use of technology determine the way you teach?
12. In what way has technology affected your performance?
13. Do you have enough time to use digital technology?
 - i. It takes more or less time with
 - a. Learning how to use it
 - b. Updating and adapting your pedagogy and didactics
 - c. Planning
 - d. Evaluating
 - e. Keeping up-to-date with the "latest"
14. Do you think that the necessary resources are available for you to be able to use digital technology (Manuals, policies, guidelines, Skills development...)?
15. How compatible do you think the technology is with the work you do daily? How well does it fit in?
16. How compatible are the different techniques and systems you use towards each other (e.g. teaching platform, grading system...)?

V. Voluntariness

17. Do you have an obligation to use technology in your daily work? From whom? In what ways?
18. Do you use technology more than requested? Why? How?

Appendix B: General Observation Tools

1. What are the various activities (including class preparation, breaks, events, meetings, advising...) that teachers engage in inside the school? How much time is allocated for each of these activities?
2. Do teachers have individual or shared offices?
3. Do teachers discuss the use of digital technology? What do they say?
4. Describe the classroom settings? How are the benches shaped?
5. Are there facilities for the use of interactive whiteboards, Internet, iPads, projectors, and laptops?
6. How do teachers spend the short time occurring in between classes?
7. Are the teachers who have been nominated or won awards in the use of technology, specifically acknowledged in the school?
8. Do teachers receive training in this area??
9. Where does the technology equipment employed come from? Is it owned by teachers or by the school?

Appendix C: Specific Observation Tools

- 1.** Does the teacher use the projector and the white board?
- 2.** Does the teacher use the interactivity of the white board?
- 3.** Does the teacher connect his/her iPad/laptop to the projector/white board?
- 4.** Does the teacher's laptop frequently go into sleeping mode? If yes, how does he/she deal with this issue?
- 5.** Does the teacher mirror everything on his/her laptop (including emails and administrative documents) into the projector?
- 6.** Does the teacher know how to start the projector?
- 7.** Does the teacher know how to work on the computer being connected to the white board? Is it a complicated or smooth process, based on what you see?
- 8.** Does the teacher plan his/her lesson based on the use of digital technology in the classroom?
- 9.** Does the teacher know whom to call when having a technical problem? Is the responsible team really helpful?
- 10.** How many power outlets does the class include?
- 11.** Is the teacher enough for the whole class?
- 12.** Does the teacher combine the use of both traditional and digital technology in her/his lesson plan? If yes, then:
 - i.** How much time is spent on this?
 - ii.** How well is it explained and integrated?
 - iii.** Does the teacher use both on purpose or merely to create a break in learning?
- 13.** Are exams/quizzes conducted on computers/digital devices or on paper?

Appendix D: Chi-Square distribution table

df	Probability level (alpha)					
	0.5	0.10	0.05	0.02	0.01	0.001
1	0.455	2.706	3.841	5.412	6.635	10.827
2	1.386	4.605	5.991	7.824	9.210	13.815
3	2.366	6.251	7.815	9.837	11.345	16.268
4	3.357	7.779	9.488	11.668	13.277	18.465
5	4.351	9.236	11.070	13.388	15.086	20.517

Appendix E: Consent Letter



5/23/2019

To Whom it may concern

This is to certify that Mr. Abdul Rahman Abou Niaj with Student ID number 20170215 is a registered part-time student in the Master of Education offered by The British University in Dubai since September 2017.

Mr. Abdul Rahman is currently collecting data for his research (The Manipulation of Digital Technology into The Classroom Settings: The Various Effects on the Teacher's Role and Practices)

He is required to gather data through conducting questionnaires and observations that will help him in writing the final research. Your permission to conduct his research in your organisation is hereby requested. Further support provided to his in this regard will be highly appreciated.

Any information given will be used solely for academic purposes.

This letter is issued on Mr. Abdul Rahman's request.

Yours sincerely,



Dr. Amer Alaya
Head of Academic and Student Administration

