

The Role of Technology in Pakistani Private Schools: The Principals' Perspective

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Abstract

Investment in technology in the field of education has increased radically over the past 2 decades. The main reason for this is the notion that technology will restructure our schools and reform the system of education. Although this trend initially began in developed economies, it can now also be witnessed in various developing countries. Both policymakers and technology companies are supporting this trend, however, a number of researchers have repeatedly made calls for critically assessing the usefulness of integrating these technologies in schools.

The primary aim of our study is to explore the perceptions and experiences of private school principals in Pakistan regarding the implementation of digital technologies. In most developed countries, there was an evident push from the governments to integrate technology in schools. However, in the case of Pakistani private schools there is no government intervention for technology integration as the schools are owned and operated by individuals and private trusts. Many of these individual school owners also act as the principal at their schools as well. Based on the aforementioned information, the views of these school principals are invaluable to understand technology integration in Pakistani private schools.

The analysis from the interviews, which was the sole technique used to gather data, revealed that the majority of principals viewed technology integration positively. Abundance of information and enhancement of student learning were seen by them as the two key values of technology. The interviewees emphasized that overreliance on technology can have a negative impact. The school heads identified four major barriers to successful technology integration: teachers' readiness; cost of technologies; school culture; and state infrastructure.

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Chapter 1. Introduction

It is evident that technological advancements have transformed our society over the past few decades. From transport to communication; from farming to banking; from healthcare to education; all sectors have significantly been affected by the evolution of technologies. The development and ubiquitous existence of technologies is often praised for increasing productivity while also making our lives easier. The compelling positive narrative around technological development has enhanced the focus given to technology in the field of education as well.

Investments on technology in schools are increasing drastically. Lim et al. (2013) assert that schools' investment in technology has increased by a factor greater than one hundred times over the past twenty years. This indicates that technologies have acquired a very special position in the minds of policymakers and educationists. However, there is an underlying tension between researchers regarding the relevance and benefits of educational technologies. Authors such as Marc Prensky are believers in technology that claim we are still lagging at technology use in schools, and that technology is the only way to reform schools as the new generation (digital natives) has been rewired (Prensky, 2001). On the other hand, academics such as Neil Selwyn challenge the idea of technological determinism and call for a more critical stance towards technology integration (Selwyn, 2009).

Zhao et al. (2002) claimed that the results of technology integration are mixed. They added that although various papers have concluded that technology can improve student learning and school management in various ways, there are numerous papers out their which argue otherwise. The difference between the outcomes of traditional teaching methods and modern technology aided teaching is unclear. There are various studies done in the U.S that indicate that even after a major increase in access to computers in classrooms: computer use for educational purposes has been low.

A number of researchers including Lai et al (2015) have concluded through their studies that to yield positive outcomes from technology integration: special attention needs to be paid on how technologies are used and integrated into the system. Lai et al

(2015) found that computer rooms in many Chinese schools were not frequently used because the schools are not sure about how to use them to facilitate student learning. This suggests that investment on buying new technologies will not be productive, unless there is proper planning and training.

1. Research Rationale, Context & Objectives

Educational technologies are not only gaining popularity in the developed world, but also heralding a rise in their usage in developing countries. In the case of Pakistan, technological peripherals are not very common in state schools; however, their popularity has tremendously increased in private schools. These schools are mostly owned by individuals, who in many cases are also the principals. The decision to incorporate technologies solely lies on the school's leadership, as the government does not normally interfere in the general operations of these schools. Hence, there is a wide range of differences in how these technologies are perceived and used in these institutions. It is pertinent to mention that technological giants such as Intel and Google operate in Pakistan, along with smaller technology suppliers. These organizations play a role in promoting technologies in the education sector.

There is a gap in the research on Pakistani private schools, especially in regards to technology integration. In a scenario where schools are not regulated, there is a lack of existing research, and big technology firms are endorsing educational technologies, it is very important to carry out a thorough qualitative analysis to explore and understand the scenario while simultaneously discovering possibilities for future research.

In this research project, we will investigate technology integration in Pakistani schools from the point of view of the principal. A reason for focusing on the principal is that he or she is the chief decision maker in these schools.

The primary goal of this research is to understand the perceptions and experiences of private school principals with respect to the integration of educational technologies. We aim to investigate the relationship between principals' views on the value of technologies and the level of technology integration in their school. Another objective

of the study is to discover the factors that principals consider vital for promoting or limiting technology integration.

2. Structure of the Dissertation

There are a total of five chapters in discussion, including the introduction chapter. The second chapter provides a review of the relevant literature. It covers literature on the increasing use of technology in the primary and secondary educational sector, the benefits and drawbacks associated with educational technologies, factors affecting technology integration, and assessment of the importance of the role of principals.

Chapter three discusses the methodologies employed for the study, and complements the techniques with literature. The fourth chapter is the longest and most important chapter of the dissertation, as it reveals all the findings of the study and simultaneously provides an analytical discussion with reference to the literature. Towards the end of the chapter there is a section for ancillary discussion, where some key findings are discussed in regards to my personal knowledge and views.

The sixth chapter is the conclusion. It will provide a very short summary of the main findings along with future implications, the limitations of the study, and possibilities for future work.

Chapter 2. A Review of the Literature

The aim of this chapter is to provide an overview of the available and relevant literature on the evolving use of digital technologies in the field of education. Since there is a wide variety of research papers, books, websites and other literature available on the topic of educational technologies, we will keep our focus predominantly on 3 different categories and divide this chapter into three main sections accordingly. The first section will review the literature related to the emerging role of technology in education. The second part will focus on the importance of the school principals. Whereas, in the last section of the literature review we will shed light on the Pakistani educational context. The aforementioned classifications were chosen based on the key interests of our study.

1. The Emerging Role of Technology in Education

Over the years a number of educators have refused to rigidly define what constitutes technology; they believed that several different things could be referred to as technology and the boundaries of it are very fuzzy, if there are any at all (Mulberg, 1993). The pencil, printing press, paper, blackboard, Skinner's teaching machine and many other artefacts, were all considered technological innovations during their respective eras (White et al, 2002). Currently, the type of technology that is significantly increasing in our society is Digital technology. This mainly includes technologies such as internet, computers, tablets, smart boards, multimedia projectors, televisions, smart phones, PDAs, digital cameras, scanners and software (Fu, 2013; Cassidy, 1998; Kingston, 1992).

Over the past few decades there has been a major shift in the use of digital technologies in the field of education. However, there is a lot of nuance involved in why these technologies were introduced, what purposes they served and how they were implemented in schools (Cassidy, 1998). A single reason or role that these technologies play is impossible to identify. Despite having significant support from policy makers, numerous educationists and researchers, there are a number of barriers that limit the integration of digital technologies in schools. Different strategies are suggested to deal with these barriers, yet, the future is still unclear. This section will

try to answer the above questions based on previous studies conducted around the topic.

1.1 The Emergence

A review of the literature suggests that since the 1980s there has been a high proliferation of the use of digital technologies in the education sector (Selwyn, 2014; Kingston, 1992; Culp et al, 2005; Ertmer et al, 2012). Initial gleanings on the inclusion of technology in a learning context can be found in a 1983 report by the Commission on Educational Excellence in the United States that recommended principles of computer science and information technology be taught as a fundamental high school graduation requirement in the US (Culp et al, 2005). A similar case can be seen in the UK during the early 1980s where micro computing became prominent as an officially mandated component of the national education system (Selwyn, 2014). For instance, in 1981 the Department of Trade and Industry launched a scheme called "Microcomputers in schools", through which every school was given the opportunity to buy a computer for only 50% of the original price (Kingston, 1992). Comparable initiatives can also be seen in other Anglo-Saxon countries such as Australia and New Zealand (Schiller, 2003; Lai & Pratt, 2004).

Numerous additional similar examples can be found in the edtech literature, this makes it evident that in the past few decades' technology has been given significant importance in education and has evolved to occupy a key position in schools, especially in the case of developed countries. It is pertinent to emphasize that the main policy focus has centred on acquiring hardware and software and providing access to technologies. Hixon and Buckenmeyer (2009) state that it was widely believed among policymakers and school administrators that giving technology in the hands of students and teachers would instantly result in effective use of technologies (Hixon & Buckenmeyer, 2009). While it is essential to have technology to be able to integrate it into the system, it is also important to realize that the mere abundant existence of technology in schools will not solely improve teaching practices and learning outcomes (Berrett et al, 2012; Hixon & Buckenmeyer, 2009; Inan & Lowther, 2010). This will be discussed in detail later in the literature review.

1.2 The Rationales for technology integration

Technology has widely been viewed as a way of catalyzing change (Culp et al, 2005). Previous research indicates that calls for technology integration are ubiquitous (Waight & Abd-El-Khalick, 2012; Robertson et al, 2006; Kingston, 1992; Ertmer et al, 2012). In the United States, Digital technologies are a part of most K-12 school reform plans to address the needs of a changing society (Cassidy, 1998). Education for years and years has been regarded as a means of reforming society by teaching skills, increasing knowledge and creating a sense of citizenship. Schools are the main hubs for providing education to citizens and as per current trends (for three decades) schools need to be restructured using technology to fulfil the needs of a changing society (Cuban, 2001). New technologies are seen as primary tools for this restructuring process (Culp et al, 2005). Several educationists, researchers, policymakers and supranational organizations are a part of this thought process. For example, UNESCO in a report published in 2003 stated that ICT is a "major tool for building educational societies". Calls are made suggesting that the educational processes and systems need to be redesigned through technology to be able to provide quality education for all (Sangra & Gonzalez-Sanmamed, 2010). Technology is the focal point of most discussions that relate to solving the educational problems of today (Fu, 2013; Berrett et al, 2012). It is widely believed that technology can improve teaching methods, make learning more effective and schools more efficient, and hence, seen as the ultimate reformer (Robertson et al, 2006). Lowther et al (2008) stated in their paper that technology has the potential to improve students' skills and increase their knowledge (Lowther et al, 2008).

Over time various reasons and arguments have been presented to prove the need for educational reforms and the integral importance of technology in education. These include reasons such as *new society requires new skills*, *productivity enhancement* and *quest for quality learning* (Hepp et al, 2004). Several research papers indicate that a common rationale put forward for tech integration is that since technology is a key element in all domains such as medicine transport, architecture, and even warfare, it is essential to make it a chief component of the educational domain as well (Waight & Abd-El-Khalick, 2012; Collins, 1991). Furthermore, Allan Collins, an American educationalist claimed in 1991 that computers will infiltrate schools as a consequence of all types of work becoming computer-based over time (Collins, 1991). Another

prevalent assertion is that to be able to effectively prepare the students of today for tomorrow's workforce, it is obligatory to incorporate technological peripherals in educational processes (Culp et al, 2005; Lowther et al, 2008). This assertion also aligns with the aforementioned explanations. Culp et al (2005) mention in their paper that digital technologies, apart from being necessary for macroeconomic reasons such as training students for the job industry by providing new skill sets and vast knowledge, also has a much broader ulterior motive. This motive relates to improving industrial productivity to develop or consolidate comparative economic advantages in an increasingly globalized world (Culp et al, 2005).

Apart from all these similar and incremental reasons for integrating technology in education, there is a different, much more radical thought forwarded by Marc Prensky in 2001. He stated that the current generation of pupils is fundamentally different from the previous generations, and this difference is their fluency with technology. This notion of "*Digital Natives*" explains that the current students prefer, understand, and speak the language of technology. Hence, it is argued that current educational system needs to be moulded accordingly (Berrett et al, 2012).

As Eynon (2010) concludes in her paper, the concept (of digital natives) that this generation is entirely different compared to previous generations is not correct, in fact there has been continuity in advancement and integration of technology over time (Helsper & Eynon, 2010).

It is surprising to see that even after such a strong push towards technology implementation it has still not been effectively integrated in the education system or caused a significant impact on learning outcomes. Underutilization, misuse, use for mundane jobs, not used to its full potential are all claims found in the literature (Hixon & Buckenmeyer, 2009; Cuban, 2001; Berrett et al, 2012; Lai & Pratt, 2004; Selwyn, 2014; Severance & Starr, 2011). These claims are underscored by the results of a survey that rated education as the least tech-intensive sector among 55 different industries in the U.S (ESA, 2003). Even a survey done amongst employers showed unsatisfactory results in IT skills despite enormous focus being given to technology education (Casner-Lotto & Barrington, 2006).

As it was mentioned earlier in the literature that providing access to technology or providing abundant quantity and types of technology to schools is not an effective way to introduce technology and resolve the educational concerns. Technology integration is a dynamic, complex and fuzzy process, which is affected and influenced by numerous different factors (Tondeur et al, 2010). There is no single optimal approach, various strategies have been suggested in the literature (Tondeur et al, 2010; Ertmer, 2005).

1.3 Factors affecting successful technology integration

Olson and Singh stated in a paper in 1995 that "technology is no *silver bullet* to transform education", they further added that until technology is not implemented in a meticulous manner with a proper coherent plan, the desired outcome cannot be achieved (Severance & Starr, 2011). A clear, coherent and uniform school-wide agenda is perhaps the prime barrier towards effective integration (Severance & Starr, 2011). Other researchers have also discussed that a well devised ICT strategy is a crucial step towards successful integration of digital technologies (Tondeur et al, 2010; Vanderlinde et al, 2008). To formulate an effective strategy, it is essential to identify all possible limiting factors and constraints while taking into account the concerns and considerations of all stakeholders, especially teachers (White et al, 2002; Sangra & Gonzalez-Sanmamed, 2010).

The two most significant factors that influence the integration of digital technologies in a school are principals and teachers (Robertson et al, 2006; Berrett et al, 2012; Fu, 2013; Hixon & Buckenmeyer, 2009; Lai & Pratt, 2004), and it is staggering to see that most expenditure is directed towards hardware, software and infrastructure while the professional development of principals and teachers is often overlooked (Schiller, 2003; Tondeur et al, 2010). Due to lack of awareness, training, pedagogical support, experience and knowledge, the manner in which most teachers use these digital technologies is not effective for significantly improving student learning, hence its full potential is not realized (Fu, 2013; Tondeur et al, 2010). Teachers often use technology as an add-on tool to reward students or extend their traditional teaching methods rather than use technological tools to transform them (Robertson et al, 2006; Berrett et al, 2012). It is also argued that as teachers' core values and beliefs about teaching and learning are not in sync with technology integration, it hinders the

process severely (Hixon & Buckenmeyer, 2009; Lai & Pratt, 2004). It is pertinent to mention here that most of the issues related to teachers have a significant connection with the school leadership and the principal. A major factor mentioned in most articles, either directly or indirectly was the vital role of the school leader, the next entire main section of the literature review will be dedicated to thoroughly discuss all aspects of the role of principals as it is the main focus of our study.

In addition to the issue of staff development there are other factors that also need be accounted for in order to successfully integrate technology (Robertson et al, 2006). If these factors are not dealt with appropriately then they can turn into major barriers (Fu, 2013). These are divided by Ertmer (2012) into two groups, first-order barriers and second-order barriers. Second-order barriers mainly relate to the teacher, and they have already been discussed. The first-order barriers include resources, institution, institutional culture and assessment (Ertmer et al, 2012). There is no doubt that access to technology can play a role in removing some of these barriers, however, it is not sufficient (Ertmer et al, 2012). Based on a review of the literature the other factors involved with technology integration are scheduling problems, funding issues and technical issues (Cassidy, 1998). Institutional and school culture has also been regarded as a major factor. Studies suggest that efforts should be made to develop and promote a culture that is conducive towards technological learning and innovative teaching techniques prior to integrating technology completely (Robertson et al, 2006; Cassidy, 1998). Jo Shan Fu (2013) in his review concludes that apart from the availability and accessibility to technological peripherals, it is important to provide technical and administrative support, alter the curriculum accordingly, provide time and assistance to change the school culture and modify assessment procedure and expectations (Fu, 2013). It can be seen here that most of the factors are interconnected and dependent on each other, and hence should be approached simultaneously and not in isolation. An interesting idea was floated by Allan Collins in 1991 that all these problems and issues will be solved overtime as he stated that any new invention can take an extended period of time to settle in and make an impact. To back his claim, he presented the example of the printing press, which is “still affecting the development of public education” (Collins, 1991).

1.4 The Value of technology

Literature indicates that when digital technologies are appropriately and adequately integrated into schools, they can lead to various benefits for teaching and learning (Hepp et al, 2004; Lowther et al, 2008; Fu, 2013). These benefits include easy access to a wide variety of digital information (Fu, 2013; Watts-Taffe et al, 2003), e-collaborations and distance learning opportunities (Cassidy, 1998), increased student confidence ((Reid, 2002)), motivation and interest (Ertmer et al, 2012; Waight & Abd-El-Khalick, 2012), better understanding of concepts due to visualization possibilities (Waight & Abd-El-Khalick, 2012), ease of writing, editing, manipulating and storing large amounts of data (Severance & Starr, 2011), and better prospects for student-centred, self-directed learning and skills for life-long attainment of knowledge (Sanchez & Aleman, 2011).

Most researchers have pointed out that a constructivist approach to technology implementation is most valuable (Levin & Wadmany, 2006; Koc, 2005; Cassidy, 1998). Since digital technologies entered the realm of education there has been more focus towards changing practices from a behaviourist perspective to a constructive one, however, it is still in transition. Since the 1980s' inclusion of digital technology that is more interactive, the ideas of Piaget and Bruner gained more popularity (Cassidy, 1998). A study carried out by McMahon in 2009 found that there is a positive relationship between critical thinking skills and higher order computer skills (McMahon, 2009). It is argued that a constructivist approach to learning with technologies will yield more and better benefits, primarily critical (higher-order) thinking skills through inquiry based learning that has been made feasible with the introduction of interactive digital peripherals (Levin & Wadmany, 2006). This idea has been discussed by several researchers in different ways; it has been called transmission of knowledge versus creation of knowledge (Levin & Wadmany, 2006), teachers as transmitters versus teachers as facilitators (Cassidy, 1998), learning 'from' computers versus learning 'with' computers (Koc, 2005). It is important to mention here that the argument is that constructivist learning approach has more advantages, not that behaviourist method of using technology will have no benefits. The key benefit of the behaviourist approach is motivating the students. A study in 1999 found that several teachers viewed technology as a tool to reward their students and keep them interested in the lesson (Koc, 2005, r10).

Another noteworthy shift in how technology has been perceived over the decades. Computer technology initially in the 1980s and over the early 1990s was looked upon as a specialist academic subject on its own: students were taught how to use technology. This narrow view changed over time and digital technologies were then increasingly looked upon as a medium to teach: a teaching aid (Mulberg, 1993; Kingston, 1992) and pedagogical tool that can be used to teach different subjects such as math, science, history and languages. A study revealed that technology use had a positive impact on educational outcomes for English and Science (Machin et al, 2007).

Apart from playing a pedagogical role, technology also plays the role of an administrative tool (Hepp et al, 2004; Kingston, 1992). This role is not as debated or controversial as the first one. From an administrative point of view, technology makes the job much more convenient and efficient (Reid, 2002). Some uses mentioned in the literature are lesson planning (Hepp et al, 2004) and student record keeping (such as grades, attendance, general progress). Teachers claim that email and other online e-platforms have made their communication amongst each other and with the school and students much easier (Reid, 2002). At the school level it has made record keeping more efficient (Cassidy, 1998). Digital technologies have also made it easier for schools to provide information and news to the parents, and have better information circulation within the school (Hepp et al, 2004).

1.5 The Concerns and Drawbacks

Waight and Abd-El-Khalick claim on the basis of history of technology that while learning technologies deliver benefits, they also lead to other unintended consequences (Waight & Abd-El-Khalick, 2012). As White et al (2002) pointed out that classrooms are fuzzy spaces, and therefore the overall impact of technology cannot be precisely measured and understood (White et al, 2002). Several researchers argue that even after decades of technological existence in schools, the promise of technology has not been fulfilled (Hixon & Buckenmeyer, 2009; Selwyn, 2014; Cassidy, 1998; Lowther et al, 2008; Gulbahar, 2007). Due to these reasons several educators and researchers are at times sceptical about the use of digital technologies in schools as there might be potential disadvantages that have not yet been realized.

A common disadvantage of digital technologies that has been voiced in the literature is the cost involved with their integration (Wang & Chan, 1995; Cuban, 2001; Kingston, 1992). It is argued that these new technologies have a short time span, which increases hardware, software and training costs (Kingston, 1992). Although hardware and software costs have significantly decreased over time, periodic maintenance costs are high and recurring. Wang and Chan (1995) also claimed that heavy interaction with technology can result in a loss of human touch and result in a type of individual isolation (Wang & Chan, 1995). Al-Bataineh and Brooks (2010) expressed a similar concern in their paper, they stated that the effects that technology can have on the social and emotional development of children are yet to be understood. They also advised that educators should be cautious about the physical effect that the overuse of technology can have, such as eyestrain or stress (Al-Bataineh & Brooks, 2003). Cassidy also points towards the potential negative effects of digital media's overuse on children health. In her paper she writes that parents are concerned that children spend too much time around technology, neglecting physical activities. Another concern mentioned in her paper is that parents are worried about the content their children can be exposed to online: pornography, hate speech, controversial images, extreme views and online predators (Cassidy, 1998).

A major drawback of technology highlighted throughout the literature in different ways was a potential for the misuse of time (Gulbahar, 2007; Cuban, 2001; Cassidy, 1998; Li, 2007). Gulbahar (2007) claims that improper planning of technology use can lead to the inefficient loss of time (Gulbahar, 2007), while Cuban (2001) fears that children will waste time playing games and doing unproductive activities on these peripherals (Cuban, 2001). A study conducted by Li in 2007 concluded that students are overly enthusiastic about using technology in class whereas teachers did not seem to have much appreciation of digital technologies, and that this polarization is troubling and counterproductive (Li, 2007).

2. Importance of the Principal

Section 2.1.3 of the literature review outlined that one of the critical players for successful and effective technology integration in a school is the principal. This section will review literature regarding the vital role that a school leader should play in the technology integration process.

2.1 The Principal's Role

A considerable amount of literature indicates that the qualifications, experience, competencies, knowledge, and motivation of a school principal are major factors that drive school improvement, change and effectiveness (Schiller, 2003; Lai & Pratt, 2004). Kelley states that "Education leadership is possibly the most important single determinant of an effective learning environment" (Robert, 2005). It is argued that no reform can survive a principal's opposition (Brockmeier et al, 2005). A principal's role has always been given immense importance when assessing the reasons behind the success of a school, as the old maxim states "effective principal effective school" (Bossert et al, 1982). However, it is odd to see that most of the literature on technology integration is focused on teachers and other factors, while there still seems to be a gap in the research done on principals in relation to technology (Schiller, 2003, Brockmeier et al, 2005; Machado & Chung, 2015; Berrett et al, 2012). There is no doubt that teachers' attitudes, knowledge and beliefs significantly affect the success of technology integration, but literature designates the responsibility of influencing teachers primarily on the principal (Schiller, 2002; Stevenson et al, 2015; Machado & Chung, 2015,).

Previous studies have shown that a principal can impact classroom outcomes largely in two ways. Firstly, by directly influencing the process of teaching and learning; through selection, support and development of teachers. Second pathway relates to indirect activities such as creating an atmosphere and environment in the school that fosters innovation and positive change (Darling-Hammond, 2010). Hammond et al. mention that contemporary principals should be a combination of instructional and transformational leaders, rather than just administrators or transactional leaders (Darling-Hammond, 2010). Marks & Printy (2003) coined the idea of integrated leadership, which endorses the aforementioned concept (Marks & Printy, 2003). A review of several papers related to school leadership pointed out certain roles and attributes of effective principals:

- Working in collaboration with teachers, aiming to improve classroom effectiveness, by assessing, supervising, modelling and providing on-going support. (Darling-Hammond, 2010; Berrett et al, 2012,)

- Providing opportunities for professional development to teachers. (Lai & Pratt, 2004; White et al, 2002; Stevenson et al, 2015)
- Organizing and evaluating instruction, curriculum and assessment. (White et al, 2002; Marks & Printy, 2003)
- Monitoring and communicating with teachers, while understanding their views and needs, and acting as information centre (Bossert et al, 1982; Robert, 2005)
- Welcoming critical feedback. (Robert, 2005)
- Establishing and maintaining a positive climate (school culture) that encourages teamwork & innovation, simultaneously allowing a certain level of autonomy to teachers. (Berrett et al, 2012; Tondeur et al, 2010; Robert, 2005; Bossert et al, 1982)
- Creating a shared vision for the school with clear goals, and steps to accomplish them.
- Giving teachers a say in the decision making process. (Robert, 2005; Darling-Hammond, 2010; Berrett et al, 2012; Marks & Printy, 2003)

2.2 The Technology Leader

The popularity of digital technologies in the field of education has altered the role of school principals by adding a major aspect of being a technology leader (Stevenson et al, 2015; Garland, 2010; Schiller, 2002). Several papers have identified the school leader as vital to introducing, implementing and integrating technologies into the system (Berrett et al, 2012; Moolenaar et al, 2010). The school principal is regarded as key change agent for introducing technology (Lai & Pratt, 2004; Waxman et al, 2013). Becta (2002) revealed that two of the most critical factors for effective technological implementation are the states of administrative and technological leadership in the school (Lai & Pratt, 2004; Becta, 2002). Tondeur et al (2010) claim that the principal can play a major role in integrating and merging technology with instruction (Tondeur et al, 2010; Waxman et al, 2013).

A substantial amount of literature reveals that most principals have a positive view towards technology, and value it for educational purposes (Waxman et al, 2013; Schiller, 2002) Furthermore, they even realize that they have a critical role to play in its successful incorporation (Schiller, 2003; Garland, 2010; Schiller, 2002). However,

researchers argue that the principals have a much greater role to play as compared to merely accepting the potential benefits (Lai & Pratt, 2004; Brockmeier et al, 2005). The principals need to lead by initiating the change process, formulating a meticulous strategy, facilitating the implementation, creating a coherent culture, modifying the curriculum and providing continuous support (Garland, 2010; Tondeur et al, 2008; Berrett et al, 2012). Studies have concluded that initiator style principals are more successful in effectively integrating technology into their systems (Schiller, 2002; Robertson et al, 2006). Effective leaders of this era are known to be visionaries (Brockmeier et al, 2005). The most applicable technological vision is one which has been designed in accordance with the views and ideas of the teachers, and not simply a top-down command (Tondeur et al, 2008; Berrett et al, 2012).

Prior research signifies schools culture as a major factor for technology integration and it also indicates a strong relationship between the culture and organizational leader (Moolenaar et al, 2010; Schiller, 2002). Brockmeier et al (2005) claimed in their paper that when a school's principal is comfortable with technology, then it has a positive impact on the entire school's usage of technology (Brockmeier et al, 2005). Studies have also reported that teachers claim that a principal's positive attitude towards technology motivates and supports them to integrate technology into their classroom (Waxman et al, 2013). This is in sync with what several researchers have suggested: principals should be role models (Berrett et al, 2012). It is essential for school leaders to have adequate knowledge of technology to be able to lead by example (Schiller, 2002). In most schools, principals take charge of a budgetary allocation role, however, to be able to efficiently invest in technology they need to have an understanding of it (Garland, 2010).

A study on school principals by Schiller in 2002 revealed that most principals provided assistance to the teachers in different ways. The terms used were facilitator, helper, guide, mentor, coach, and counsellor. Furthermore, a majority of principals viewed that staff development was a key issue (Schiller, 2002). This also been previously mentioned in the literature that teachers' attitudes, knowledge and competency in regards to technology use is a major barrier. However, it is widely claimed in the literature that principals have the power to influence teachers in various ways (Fu, 2013). Apart from creating a change fostering environment, involving teachers in vision creation and providing technical assistance, an effective method to

change teachers' perceptions and beliefs towards technology is by providing them long-term professional development programs while also showing them evidence of benefits of technology usage in classroom (Lai & Pratt, 2004; Fu, 2013; Stevenson et al, 2015; Tondeur et al, 2008). As per Schiller (2002) training should be of two sorts; training teachers to acquire the skills to use peripherals in general and to competently integrate those technologies into classroom practices in order to improve student learning (Schiller, 2002).

2.3 Novel Issues & Potential Solutions

It is evident that being a technology leader is relatively a recent alteration to the principal's existing role, and brings with it various new responsibilities and challenges (Garland, 2010; Mcgarr & Kearny, 2009). Altering teachers' perceptions to increase their willingness (Machado & Chung, 2015), modifying the curriculum to integrate with technology (Garland, 2010) and allocating resources effectively on technology (Machado & Chung, 2015) are issues that have been discussed for decades now, and similar issues have been faced earlier in educational history. However, there are some fresh issues emerging due to the increased incidence of technology that school principals will have to soon tackle. This part will attempt to briefly identify some emerging challenges:

- Methods for evaluation of technology (Waxman et al, 2013)
- Allocation of resources for new technologies (Machado & Chung, 2015)
- Underdeveloped and underutilized ICT polices. (Tondeur et al, 2008)
- Lack of professional development for principals and school administrators with reference to technological engagement. Many principals are novice users of technology (Waxman et al, 2013; Brockmeier et al, 2005; Marks & Printy, 2003; Schiller, 2003)
- Probability of digital divide due to unbalanced technology usage between different subjects (Garland, 2010)
- Issues of plagiarism, misuse of internet and cell phones in schools (Garland, 2010)
- Student health and environmental issues (Garland, 2010)
- Lack of technology implementation models (Fu, 2013)

- Support from the technology industry to implement technology in schools (Schiller, 2003)
- Lack of technology advisors for principals, leading to reliance on inexperienced peers or eager salesmen (Schiller, 2003)

Researchers have attempted to suggest possible solutions for some of the aforementioned concerns:

- More focus on principals' professional development (Schiller, 2002; Schiller, 2003; Berrett et al, 2012)
- Make use of hindsight to improve on previous mistakes, and plan long term (Cassidy, 1998; White et al, 2002)
- Form policies for cell phones and internet usage (Garland, 2010)
- Educate students and teachers regarding safe online practices & copyright laws (Garland, 2010)
- Employ health, safety and environmentally sounds procedures for technology use (Garland, 2010)
- Narrow digital divide by integrating technology into entire curriculum (Garland, 2010; White et al, 2002; Mcgarr & Kearny, 2009)
- Employ educated, skilled and experienced technology coordinators, and give them a significant role instead of just using them as technical assistants (Lai & Pratt, 2004; Tondeur et al, 2010)
- Create technology coaches and mentors from within peers (Machado & Chung, 2015)

The promising benefits of technology can only be realized by integrating it effectively in a manner that results in a positive, productive learning experience. School principals of the 21st century should become familiar with capabilities of various technologies, learn to use them and especially understand how technology can be applied to teaching and learning practices. These seemingly time-consuming and painstaking efforts will later assist them in becoming enablers and facilitators of technology integration. As Mulford et al (1991) stated "we must learn how to lose time in order to gain time" (Robertson at al, 2006; Mulford et al, 1991).

3. The Research Questions

It was revealed through the literature review that research done on Pakistani Education system is quite limited. In addition to the research being limited, a significant lack of rigour in the papers available was prominent. Due to these reasons we did not add a section for Pakistani Educational Context in the literature review, however, section 3.2 gives a brief overview. It was observed during the literature search that there is a critical gap in the research on Educational technologies in Pakistani schools, especially the private schools.

In the light of previous studies on similar topics and based on our own intuition, we devised the research questions. The main research question for our study is:

- What are the perceptions and experiences of principals regarding the role of technology in Pakistani private schools?

It can be inferred from the above literature that principals play a major role in technology integration. Their views and experiences regarding technologies should have a significant impact on the policies and practices of the school. In the case of Pakistan many of these principals were also school owners, which gave them unrestricted decision making power. To guide us throughout the research we had three sub-questions:

1) What is the practical understanding of principals regarding the implementation of technology in schools?
2) What is the perceived value of digital technologies in private schools?
3) What are the factors affecting technology integration in private schools from a principal's viewpoint?

Chapter 3. Research Methodology

1. Research Design

This paper addresses the perceptions and considerations relating to the Role of Technology in Pakistani Private Schools through a qualitative analysis of the perspectives of school principals. The qualitative study is an open-ended, exploratory case study that utilizes semi-structured interviews with school principals at leading private primary and secondary schools in Karachi, Pakistan.

The exploratory inductive design provides a nuanced context for understanding and inferring the nature of participant responses in the absence of pre-conceived biases or assumptions that might jeopardize the trustworthiness of the conclusions from the study. The exploratory design helps formulate research that is "conducted in order to determine the nature of the problem, exploratory research is not intended to provide conclusive evidence, but helps us to have a better understanding of the problem." [Saunders et al. (2007, p.134)]

The integral starting point towards conducting education research relates to an emphasis on methodological design that underscores the assumptions and the guiding keystone characteristics of the prevalent subject under review. Research design is conceived to be "a plan or protocol for carrying out or accomplishing something." (Maxwell, 1996 p2). Qualitative research is not congruent with typological or sequential design models as design components need to be continually assessed, reconsidered and modified during the course of the study to incorporate new developments or changes in underlying components (Maxwell, 1996, p2). Therefore, the application of linear and one-dimensional series of design steps are not appropriate in the context of an effective qualitative research methodology.

Hammersley and Atkinson (1983, p 24) state that a qualitative study requires a design that should follow a "reflexive process operating through every stage of a project". The reflexive process complements the simultaneous interaction of data collection and analysis, theory development and modification, formulation of research questions, and the identification of validity threats in relation to the research

conclusions. An interactive research model is interconnected and flexible and allows the researcher to create coherent and scalable relationships between research components (Maxwell, 1996, p3).

The research methodology for the subject under review is designed to help accentuate results that cover the following four research topics:

A. The principals' knowledge and view on educational technologies
B. The perceived usefulness of technology integration
C. The barriers to technology integration

The research approach relies upon the use of inductive reasoning to infer conclusions from semi-structured interviews. Semi-structured interviews are considered the most opportune mode of qualitative research with respect to collecting authentic individual perceptions about historical trends, present relationships and future predictions with regard to a topic (Burgess 1984, Stake 1995). Interactions with school leadership, i.e. principals, are also designed to be necessarily reflexive in that questions need to be shaped and modified in real time. Research data needs to be meaningful, free of bias, and be able to analyze complex issues at a deep level. The use of semi-structured interviews fulfils most of the aforementioned research criteria and allowed the study to cover underlying interpretations and data contradictions of technological integration in the education sector.

In this respect, the study covers both epistemological and ontological considerations. The epistemological framework addresses the breadth of acceptable knowledge in a discipline (Bryman, 2008 p13), whereas the ontological framework addresses the relationship of a particular discipline to social constructions with regards to the perceptions and actions of social actors (Bryman 2008, p18).

The epistemological approach was interpretivist as it is suitable for analyzing the role of technology in the education sector given the reliance on human behaviours and social constructs. Interpretivism aids in an "empathic understanding of human action rather than with the forces that are deemed to act on it" (Bryman 2008, p15) and

allows the nuanced appreciation of the subjective impact of social behaviours on a discipline.

Ontology compartmentalizes positions between objectivism and constructionism. The constructionist argument lays out the "intellectual predilection for stressing the active role of individuals in the social construction of social reality" (Bryman 2008, p20). Technological integration in education is highly susceptible to the interactions between social behaviours that are fashioned by industry participants i.e. teachers and principals. The constructivist ontological approach is therefore most relevant to the research being conducted.

2. The Context

The proposed study was solely conducted in Karachi, Pakistan, with the implicit aim of transposing realized themes and narratives into the wider context of private education in Pakistan. My personal motivation to undertake the study was to scrutinize, assess and highlight the role of technology as a learning mechanism and its effect on the education sector in Pakistan. My own experiences not only as a student but also as an intern at a secondary school in Karachi within that learning environment made me curious to analyze the impact of technologies on teacher engagement and student interaction with academia.

The classification of schools into public institutions and private institutions and the distribution of students are presented in the following table (Pakistan Education Statistics, 2015, p14-20):

Table 1 Classification of Schools in Pakistan

	Primary		Middle		Secondary	
	Institutions	Students	Institutions	Students	Institutions	Students
Public	127,829	11,365,000	16,820	4,103,000	12,567	2,189,000
Private	19,399	7,011,000	27,998	2,315,000	18,688	1,176,000
TOTAL	**147,228**	**18,376,000**	**44,818**	**6,418,000**	**31,255**	**3,365,000**

The participants for this research project were principals of private schools in Karachi, Pakistan. One of the major reason we decided to interview principals for our

research was that a significant amount of them our also the owner of their respective schools. Hence, their opinions and views are most important to understand as they have a pivotal affect on technological outlook in these private schools. We only chose principals of schools that are from Year 1 to Year 10/11 i.e. primary and secondary schools. Public schools, Madrassas and low income private schools' principals were excluded from the scope of the study due to the lack of capital resources and infrastructure at such institutions to integrate technology into the curriculum or as an adjunct learning tool. 48% of government schools are in a dangerous or dilapidated condition and lack basic facilities such as furniture, bathrooms, boundary walls, electricity and running water. (Alif Ailaan, 2016). Whereas, madrassas are instructional centres solely for tradioational religious education; (Mumtaz Ahmed, 2004). Therefore, it was not relevant to consider madrassa system as part of this research.

Furthermore, there was no discrimination made while choosing the schools, based on criterias such as gender segregated schools, or schools following different examination boards - Agha Khan,Cambridge, IB, Provincial board, Federal Board.

There is limited technological integration in Pakistani private schools due to nascent understanding of the benefits of technology in a learning context and budgetary constraints in the education sector. Nonetheless, there is a growing trend among private schools to invest greater resources in the application of digital technologies in the classroom in order to remain relevant in an increasingly globalized society.

According to a paper published in 2013 in the International Journal of Academic Research in Business and Social Sciences, many computer and non-computer based technologies have lately been integrated into Pakistan schools (Faizi et al, 2013). Technology in use includes: computers, LED monitors, projectors, wireless classroom microphones, mobile devices (clickers or smartphones), smartboards (Interactive whiteboard providing touch control of computer applications) and online media.

3. Data Collection Method - Interviews

In-depth qualitative interviews enable researchers to discover the experiences and perceptions of others, to understand an issue based on external opinions and

perceptions rather than one's own perceived understanding. Qualitative interviews are mostly used for participants who have deep knowledge and experience of the issue. As the research is based on an interpretive constructionist paradigm, semi-structured interviews was one of the most appropriate methods as they assist the researcher to learn how people view and understand different objects and events (Rubin & Rubin, 2012, p. 3 & 15).

The only method employed for collecting the data was face-to-face semi-structured interviews with the school principals. A major benefit of this method is that it allows a certain extent of modification in questions to follow up and investigate an interesting concept that might emerge during the interview. This can significantly help in understanding a phenomena and the reasons behind it in detail, which any online or postal surveys or questionnaires cannot (Robson, 2002, p. 273). As our main aim was to get a deeper understanding of the issues regarding educational technologies in the schools, this technique seemed best suited.

To choose the participants of the study we used the purposive sampling technique, which is a category of non-probability based sampling. Purposive sampling characterizes the sample population by its underlying characteristics and is structured to draw out participants that are most relevant to the objective of the study Maxwell (1997, p. 87). Therefore, purposive sampling is most appropriate when researching a distinct subset of the overall population; in this case the views held on learning technologies by principals of private, fee-paying schools in Pakistan.

The major criticism of purposive samples relates to the potential presence of bias when selecting the sample from the overall population, therefore, it is important to collect the sample from as diverse a range of potential participants within the defined population subset as possible (Seidler, 1974). In our case, we selected principals based on the limited information we could find online as there was no official list of private schools available to us. We tried creating a comprehensive list and select principals from a range of schools based on the examination board they follow, the fee they charge, the age and size of the school. This was our attempt to eliminate the bias gather all types of participants we could approach.

A list of private schools in Karachi was made using online resources such as Karachi Metropolitan Corporation official website (kmc.gos.pk). School websites were visited and reviewed, and 42 private schools in different areas of the city were subsequently sent an email to be invited to participate in the study. Only 29 replied, out of which 6 rejected citing reasons such as principal has no connection with technology, and has a very busy schedule. 3 schools requested that I interview their ICT teachers/heads as the person was better equipped for the interview rather than the principal, however, I declined as it was against the study's basic design and purpose. 20 schools agreed to participate in the research project. 19 of the 20 school principals were finally interviewed, as one of the principals declined to participate in the research project when I reached her office. All interviews were taken in the principals' offices and primarily English language was used. The table below shows how the interviews were distributed over three weeks.

Table 2 Schedule of Interviews

Schedule of Principal Interviews		
Week 1	**Week 2**	**Week 3**
11 April 2016 – 16 April 2016	**18 April 2016 – 23 April 2016**	**25 April 2016 – 30 April 2016**
1. School H 2. School J 3. School K 4. School L 5. School F	6. School A 7. School N 8. School C 9. School S 10. School G 11. School R	12. School M 13. School E 14. School O 15. School H 16. School P 17. School Q 18. School B 19. School D

Crouch and McKenzie (2006) claim that a smaller sample size, typically less than 20 is ideal for qualitative interviews based research, as the main goal is understanding the issues in depth by creating close association with the respondent (i1). Most interviews lasted between 40 and 50 minutes, while the shortest was 27 minutes. The longest interview continued for more than 2 hours. The interview guide was followed for all interviews, and is attached in the appendix for reference. A pilot interview was carried out using the interview guide with a private school's principal who

volunteered for it, and the interview guide was slightly modified subsequently on the basis of the pilot interview experience.

4. Data Analysis

The integrated and convoluted linkages between tracts of data need to be framed, presented and analyzed in an impartial and objective manner to minimize the effects of pre-conceived beliefs and biases. The process of data analysis was mainly carried out in accordance with Thematic Analysis (Clarke & Braun, 2013). The Miles and Huberman framework was mainly employed as it provides a clear, structured and comprehensive guide for tracing legitimate and stable relationships between underlying social phenomena captured by the data. The three stages are data reduction, data display, and drawing and verifying conclusions. (Punch, 2013, p173). The iterative and reflexive process is necessarily complemented by the use of the Miles and Huberman framework. The approach is labelled as "transcendental realism" and covers three broad components:

The relevance of data collected is dependent upon the reliability and integrity of the techniques utilized in recording the semi-structured interviews with school principals. Each interview was audio recorded and transcribed using Microsoft Word. The transcripts were enhanced by the use of field notes, explanations and reflections. The data was coded and recoded and was subsequently displayed using thematic networks in a manner that implicitly divided codes into narrow raw categories, broad sub-themes and general themes (Punch, 2013 p 175; Saldana, 2013). The coding process ensures that underlying data is valid, mutually exclusive and exhaustive.

5. Qualitative Trustworthiness

The integrity of research involves monumental complexity and can threaten to render research conclusions meaningless and non-viable if principles of due care and diligence are not followed by the researcher. The constructivist approach posits the importance of the role of the researcher in data collection and stresses upon the need for objectivity and independence when collecting and analyzing data (Punch, 2013 p313). The paramount status of quality control in empirical research needs to be always kept at the forefront of the research methodology in order to safeguard the trustworthiness of the research. Data needs to be credible in preference to internal

viability, transferable in preference to generalisability, dependable in preference to reliability, and conformable in preference to objectivity (Shenton, 2004).

The concept of internal validity is one of the key criteria forwarded by positivist researchers (Shenton, 2004), however, for constructivist researchers the credibility of qualitative data is more relevant as it answers the query related to the relationship of the research findings with observed reality. The credibility of data is enhanced through the use of established data analysis methods that have been successfully utilized in the past or been used in comparable research projects (Shenton, 2004).

The transferability of data addresses the concern regarding qualitative research over the broad applicability of findings to a wider population (Lincoln & Guba, 1985). It is considered the responsibility of the researcher to provide sufficient context and background to the research that allows transferability inferences (Shenton, 2004). It is important to clearly delineate the boundaries of the study to control against wilful adaption of research conclusions to a wider framework that might not be relevant (Teague, Teague and Marchionini, 1987).

Data dependability provides a counterpoint to the positivist requirement surrounding the reliability of data that demands that research conducted under similar contexts, backgrounds, methods and participants should always yield the same results (Shenton, 2004). However, Marshall and Rossman (1999) note that such a rigid requirement is not possible in the realms of qualitative research given the specific situation of the study and as published descriptions are static. The dependability of qualitative data needs to be addressed by a thorough explanation of the research process within the study in order to enable future researchers to understand the context behind the research and if possible to be able to replicate it if similar narrow conditions are present.

The final qualitative data quality enhancement characteristic relates to the conformability of data. The researcher must ensure that research responses reflect the beliefs, perceptions and knowledge of the participants rather than shaped by the characteristics and preferences of the researcher. Miles and Huberman (1994) contend that the risks of researcher bias can be controlled by a transparent disclosure of

"researcher predispositions". Detailed methodological explanation is an optimal mechanism that allows independent observers of the research to draw their own conclusions regarding the conformability of data and the constructs emerging from it (Shenton, 2004).

6. Ethical Considerations

Ethics in research is a key concern, and has been described in several similar ways. Savin-Baden & Major (2012) describe ethics as "moral principles that govern behaviour" (Savin-Baden & Major, 2012, 319). A more research specific definition of ethics has been provided by Clarke and Braun in their book. They state that "Ethics are codes and practices concerned with ensuring we do research in a moral and non-harmful manner". (Clarke & Braun, 2013, p.330). The primary reason for these protocols and review boards being in place is to protect the people who are the subjects of the research - the participants (Sikes, 2006). Another major factor behind the existence of these ethical procedures is to maintain the integrity of the study and its findings, as the main aim of scholars is to seek the truth and create new knowledge based on it. Accountability and trust are pivotal elements of research (LaFollette, 1994). However, Howe & Moses (1999) claim that the increasing use of qualitative research methods have increased the complexities involved in research ethics.

The British Educational Research Association has laid down detailed and comprehensive ethical guidelines for researchers to abide by. In this qualitative research study, we aim to follow the BERA (2011) guidelines. These guidelines mainly include four different categories: Responsibilities towards the participants; towards sponsors of research; to the educational researchers' community; and towards policy makers, educational professionals and the public.

The concerns towards the participants for our study included informed consent, openness and disclosure, voluntary participation with the right to withdraw, and privacy. All participants' written consent was taken on a consent form, with which an information sheet regarding the research project was attached. The consent form and information sheet are attached in the appendix. Participants were fully aware of the purpose of the research and there was no obfuscation of any kind involved. Only the participants who agreed for the interview on email, and in person were interviewed.

Another major concern that was taken care of was maintaining the anonymity and confidentiality of all the principals involved. The names of the principals, and their respective schools were not disclosed anywhere in the paper.

The responsibilities towards the community of educational researchers mainly relates to maintaining the integrity of the research. To the best of my ability it was made sure that everything reported through the study was true, and not distorted or falsified in anyway.

The highest priority was given throughout the project to demonstrate sensitivity towards all stakeholders, especially the participants. The fieldwork was only commenced after the CUREC approval regarding the procedures employed was received on the 29th of March, 2016 from the University of Oxford.

Chapter 4. Findings and Discussion

The main research aim of this study was to understand the perceptions of principals regarding the role of educational technologies in Pakistani private schools. The first step in understanding the perceptions was to rigorously analyze the interview data. All data was analyzed using the method of thematic analysis and following the framework provided by Miles and Huberman (1994). 3 of the 19 interviews conducted were discarded at the commencement of the research analysis due to poor quality and lack of relevant responses and meaningful data. As part of the qualitative analysis, initially open coding was done and dozens of codes were identified, that were later converted into 15 categories which were carefully grouped into three major themes.

Ten out of the 16 interviewees were women. Eight of the principals were also owners of the schools. 11 school heads had previously been teachers, however most of them did not have any formal teaching qualifications. The principals had studied various subjects at university. Two of them attained degrees in Business Management, one specialized in Accounting, one had a master's degree in Mathematics, and three principals had a background in natural sciences. The remaining principals came from the humanities and social sciences.

It was discovered during the interviews that all Pakistani private schools had an internet connection and most had access to Wi-Fi in certain parts of the school. Various hardware and software was being used in these schools. The hardware that was frequently mentioned by the school heads included computers, smart boards, tablets, multimedia projectors and LED screens. The software commonly mentioned was Edmodo, various math applications, WhatsApp, Facebook and Twitter.

After analysis of the interview data, this chapter will discuss the key findings which are divided into three related categories:

1. View and knowledge on educational technologies
2. Perceived usefulness of technology integration
3. Barriers to technology integration

1. View and Knowledge on Educational Technologies

1.1 Practical Educational Aspirations

Principals indicated that their schools strive to provide quality education to the students. They stressed that the purpose of quality education is to support the development of children and enabling them to achieve their full potential. Furthermore, they said that all children are not same, therefore it is essential to provide them with choices without expecting uniform outcomes. It was evident that all principals aimed to develop the children and viewed them as distinct individuals.

> *(A)[1][2]: "A school has so many targets depending on the individual, so that they thrive and gain from the experience."*

> *(C): "How do children excel in what they are good at, so you need to counsel them, look don't go after this or that subject, first find out what they want... It's all about self-realization".*

Different principals used multiple phrases to hint upon similar ideas, such as "*explore themselves*" (F), "equip the students" (H) and "well rounded individuals" (K).

They further added that it is pivotal to develop the students with up-to-date and life-long learning skills (J). They believed that as the next major stage in the life of most students is university, they should be prepared to cope with it. They expressed that university education involves significant use of digital technologies. Few principals also revealed that most of their students aimed at going abroad for higher education, which would exacerbate technological engagement.

> *(B): "60% of our children go overseas to study in U.S.A or U.K, when they go there; they are not lost at using a gadget."*

It is pertinent to mention here that few principals gave some differing statements, such as *"it's not just about getting a degree"* (E) and *"grades are not everything"* (G). These principals focused more towards character building and citizenship (N),

[1] The letters in parenthesis denote anonymity attributed to principals interviewed for the case study.
[2] All quotes reflect the exact statements made by the interviewee and any grammatical errors need to be considered as "Said in Context" (sic).

however, even they explained that the world is rapidly changing and we need to change with it. Hence, technological skills are essential for current students.

This idea of ensuring that the students are up-to-date with technological advancements is found in various research papers, and endorsed by several educators, researchers and policymakers (Hepp et al, 2004; Waight & Abd-El-Khalick, 2012). It is believed that technology is an integral part of all industries and walks of life, hence the children of today need to be aware and equipped to deal with it.

The notion that principals incorporate technology to prepare students for university is not commonly cited in literature. However, it is similar to the popular argument of training today's students for tomorrow's workforce (Culp et al, 2005; Lowther et al, 2008).

1.2 Positive Views on Technology

The interviews predominantly revealed that principals had a very positive view towards the use and implementation of digital technologies in schools. They further claimed that other stakeholders such as financiers and parents also regarded educational technologies quite positively. Principals "F" and "L" said, regarding the use of digital technologies in schools, that they were "all for it". Most principals claimed that technology had a big role to play, some of them referred to it as a "must have" (E) and a "need" (N). A majority of school heads called technology an essential (B) and powerful (J) tool for education today – A tool that holds the potential to transform teaching and learning.

> *(G): "It could become the third tool, which is literacy, numeracy and ICT (Information and Communication Technologies). It's gone from being a discrete subject to being an essential tool."*

> *(F): "[Teaching] methodologies have changed from old times, the techniques of teaching and IT has a big role to play in them".*

> *(H): "I do feel that technology has a huge place in better pedagogy because that's how the students are learning today".*

Although principals frequently said that technology is a powerful tool and will alter current teaching methods, they kept emphasizing how technology will never be able to replace teachers. This finding will further be expounded in section 4.2.6.

Two of the 16 interviewees expressed concerns regarding excessive positive views on technology. They argued that technological peripherals are important and are a reality of time and currently being used in all sectors, however, the expectations from inclusion of digital technologies in schools were overemphasized and overhyped.

> *(A):"I think educational technology has always been [present], when I was a young teacher, the tape recorder was becoming fashionable and people would say it will revolutionize teaching. And, of course that didn't happen. I think, the current flowering of new technology will change the way teachers teach but I think it's sometimes overhyped"*

There was one principal (C) who had a very different view on educational technologies. He believed that technology has a very limited role and it can only help with certain very small elements of education.

> *"My view is that [technology] has a certain role to play in pedagogy as well, but a very limited role, unlike what many people believe in Pakistan and in many parts of the world".*

It can be observed that school heads' outlook on educational technologies was exceedingly positive. Only two principals reflected cautiously and one was overly critical. These findings are very similar to literature as educators have viewed technology as a way of catalyzing positive change in the field of education (Culp et al, 2005). However, numerous researchers have argued in their papers that effective technology integration is a fuzzy process and it is pivotal to be thoughtful regarding their implementation (Tondeur et al, 2010). Previous studies also indicate that the expected outcomes of technology integration are yet to be realized by most (Casner-Lotto & Barrington, 2006).

1.3 Limited Technological Experience and Awareness

The knowledge of most principals regarding digital technologies was quite limited. Although most principals owned computers or tablets, they were novice users and

used them for very basic purposes such as emailing and word processing. Principals "A" and "K" categorically mentioned that they were not fluent with using modern technologies and cited age as the reason. Others implied in different ways that their literacy in regards to computer technologies was low.

> *(E): "These technologies are for me very new but not for teachers who are younger, I am a dinosaur at technology… because of my age I can't learn so much so fast".*

> *"A": "I would really like to ban the whole thing up and go back; this is just an old man talking. There are times I want to throw this computer out of the window."*

The above statements signify how this lack of technological literacy is epitomized by a typical unease in using technology. Some principals believed that it was impossible to stay up-to-date with technological advancements.

A majority of principals mentioned that they have multimedia projectors and internet in their schools, and have recently introduced smart boards or iPads into their systems. The principals discussed how they frequently travel abroad and get exposed to different technologies, or read about them in educational magazines. According to most principals, they were the primary introducers of these digital technologies in their schools, but the principals were not completely aware of the uses, functions and features of these devices.

Principal "F" explicitly said that she did not understand how to use these technologies (smart boards), while commenting that technologies can have no drawbacks. These thoughts were shared by a number of other principals as well.

The most commonly cited reasons for the introduction of smart boards were: the principals had seen them in conferences abroad; heard of them from colleagues; a company selling smart boards approached them and other schools have them.

> *(B):"I saw it at a workshop which I attended with my fellow friends and was quite fascinated by it… there I saw the use of the smart boards and I promised myself that I will bring it to my school".*

> *(I): "I know it was happening in other schools, sooner or later people will be talking about it and we will be required to buy smart boards even if we didn't want to… we were investing in technology (smart boards) and we didn't know whether we could reap the benefits".*

However, some principals believed that their schools were the leaders in technology implementation and that they never follow their competitors.

> *(J): "I don't watch technology in other school and say I should have it. I am the first to have it".*

Four other school heads also made similar claims that they are the only school to have a certain type of software, or were the first school to introduce a specific technology. However, based on an analysis of other interviews it could be seen that this was not the case in reality. This shows that some principals were complacent and unaware of industry trends.

It is important to mention here that not all principals lacked knowledge and experience of technologies. In fact, a couple of principals were well aware and literate in the use of new technologies, were proficient users, and actively initiated and led technological changes.

> *(G): "In the classroom, I use the iPad and I tell all the teachers to use the iPad and Apple TV and Airplay… all my learning teaching sessions with the teachers have been done using this (iPad) and Prezi".*

These tech savvy principals even trained teachers themselves and acted as role models. It is pertinent to mention here that these principals were not significantly younger compared to other principals who claimed that age might have been the reason behind their lack of technological competency. This indicates that age doesn't preclude technological proficiency. However, a narrative could be noticed that old principals are considered to lack technological skills. This is also portrayed by the example of Principal "L" who when asked if any other school's head had any influence on her decision, she remarked:

"I think it can be the other way around because of my age group most of the principals are not that good in technology or not familiar with them"

Robert (2005) argues that the principal should be an information centre for the teachers, and be able to guide them in all aspects. Others researchers (such as Stevenson et al, 2015 and Garland, 2010) claimed that in current times a principal role encompasses being a technology leader. However, it could be seen that majority of private Pakistanis school principals were not up-to-date with technologies, in fact most of them did not believe it to be a part of their role.

1.4 Technology Introduction – Relationship between Teacher and Technology

Principals often considered their role as administrative facilitators, and viewed technology integration as mainly the responsibility of teachers. It was very evident from the principals' responses that there was a very strong focus and reliance on teachers in regards to technology implementation. They explained that teachers are the ones who demand technology, plan technology integration and use it. Although all principals gave a significant amount of importance to the teacher, there were differences in how they perceived the relationship between teacher and technology. The majority of principals expressed that their decisions regarding technology introduction are heavily dependent on teachers' attitudes and competency.

> *(H): "We are thinking about getting [smart boards] but we haven't because the teachers are not that computer savvy."*

> *(M): "There are a number of teachers who are very gung ho about [technological peripherals] and they demand it".*

A smaller group of principals viewed the school leader's job only as a provider of technologies and training to the teachers, and then gave autonomy to the teachers on the use and implementation of technology. They viewed themselves as decision makers who had to decide what technology was worth buying. Once it was bought, it was handed over to the teachers to design and plan its use. These principals considered that teachers were different from each other and this individuality adds value to the school and its students.

(E): "The top man has only two jobs: care and growth. Care for their employees and manage their growths. If I allow them autonomy, if I allow them to grow then I am educated by them, so yes, they have complete autonomy".

(D): "we make technology available to the teacher inside the classroom and then it's at their discretion… teachers have access to tablets, smart boards, audio-visual equipment, internet… but what I don't want to do is mandate the use of technology."

A third and much smaller faction of principals were of the opinion that the teachers "*must*" understand technologies and apply them; else they would eventually become redundant. This group held a more extreme position compared to the rest, as for these principals a teacher's job depended on technology.

(B): "we talk a lot about technology in my staff room in my annual talk to the teachers. And I keep telling them that if you don't switch over to technology, you will be out of a job. We need teachers who understand technology and can apply technology. 10 years ago it was taken as a joke, they didn't take me seriously but now we are making it mandatory for our teachers. Some of the senior teachers who still think that they don't need to learn technology because they have so much in their head and they are super subject masters and that's good enough and I think they will be out, it will happen in next years."

It could be seen here that most principals depended on their teachers' abilities and demand for implementation of technologies. This was an interesting and novel finding as no parallel to it was discovered while reviewing the literature. Schiller (2002) found in his research that principals viewed themselves as facilitators for technology introduction in their school. The second group of principals had a similar view to the principals Schiller interviewed in Australia. However, the third group's view was quite unique, and no similar case was found in the relevant literature.

1.5 Contrasting Approaches towards Technological Integration

It can be seen that the three groups of principals viewed technology introduction and implementation quite differently. Furthermore, it emerged from the data that technology integration was not a straightforward process. The perceptions of technology integration process differed among principals.

> *(J): "I am not aware of how technology is used in class, the teachers would know that".*

A majority of principals discussed that they were not aware of how technologies were being used in the classroom or by their staff; they did not believe it to be a part of their job to be actively involved in the integration process. The principals explained how they expected the teachers to collaborate with each other and explore the uses of these technologies.

Principal "K" also expressed that it was the job of the teachers to develop technology integrated teaching plans. She said, *"Teachers should work together to develop tech specific learning plans."*

However, most schools had heads of subjects or section coordinators who would assist and guide the teachers with the planning, but even these coordinators were not technology experts. Few of the schools had specialized I.T personnel who were well educated and trained in the use of these technologies and hence, responsible for the planning and integration of new technologies. The I.T department in these schools would team up with different subject teachers and help in developing curriculum and technologies that would be in sync with each other.

> *(B): "I house my own I.T department. I have 10 people in I.T department plus the teacher and we were very lucky that 1 or 2 teachers who taught in UAE were already trained on using different digital technologies such as the smart board."*

Principals "G" and "L" saw themselves as initiators of technology, they believed in being exemplary leaders who should be involved in every step of the integration process rather than just introducing it. These principals believed in having an active role and continuously encouraging the teachers to use technology.

The interviews revealed that there was a whole range of principals. Those who would themselves write the entire technology plan for the next year and others who explicitly mentioned that technology was introduced without a plan. It could be seen that technology integration was still a new phenomenon, and the principals were trying experimenting different approaches.

> *(A): "In my view technology has huge potential and I think we are scratching from the surface at the moment. I have always said we need 10 years till we get it to work out a bit better for educational use. You see, there is no model to follow."*

The literature review also indicates that technology integration was a dynamic and complex process, and there is no single way to do it successfully.

2. Perceived Usefulness of Technology Integration

2.1 Access to Abundant Information and New Resources for Teaching and Learning

Principals repeatedly mentioned that a great benefit of technology is the convenient access to limitless sources of information. They believed that this is an invaluable benefit of digital technologies, especially of the internet.

> *(B): "I think the sort of progressive and up-to-date knowledge that the children are able to receive with the help of computer and internet is amazing."*

> *(O): "The beauty of internet is that the stuff out there is ever increasing."*

When discussing new resources provided by the advancement of technology the school heads stated that a lot of new software had been made available to teachers and students, which had proven very effective for learning.

> *(A): "There is some fantastic software available for educational use, which is used by students. There was no such form of learning available just few years back."*

A special focus was given to new applications available for math and science learning. Khan academy was often mentioned by the principals as a very useful platform for students to learn or revise certain topics. However, Principal (C) believed that Khan Academy and the likes of it are having a negative impact:

> *"It is making students and teachers lazy, as students can just sit home and study while teachers are making use of such videos in class instead of doing the job themselves."*

It was quoted by most principals that a number of research assignments are given to students that they complete using computers and internet available to them at school, they believed that due to the availability of these technologies the students are able to conduct more effective and comprehensive research. Principal (H) thought that these technologies have made studying, especially researching much easier, and also joked:

> *"We should really respect our parents as they did not have Google in their time when they studied."*

Principals explained that digital technologies such as tablets, internet, smart boards and laptops have provided the teachers with various tools to employ while conducting classes to develop more innovative and applicable teaching methods.

> *(P): "The largest advantage that technology gives us the ability to use multiple strategies to teach, one couldn't ask for anything better than that, with a teacher and a blackboard you were confined to one model/mode for delivering".*

Principals also indicated that given the unlimited online resources, teachers now have much more information available to them, to plan and include in their lessons.

Not only new teaching techniques have been made possible with the use of these technologies, but also new methods of examinations are gradually gaining popularity. The use of computer based quizzes and game type tests were mentioned by Principals (K) and (H); they viewed these as a good addition to traditional examination methods. It was also discovered that principals (A) and (E) perceived that new technologies have enabled teachers to practice flip learning models in their classrooms, as most students had computers at home, which they could use to read up on the given topic.

Some interviewees also believed that smartphones hold a great potential for education and learning, especially when connected to the internet. However, the majority of principals discussed that smartphone is a controversial tool. This point is discussed further in section 4.2.5.

Fu (2013) concluded through his research that one of the biggest benefits of using digital technologies was easy access to a wide variety of digital information. Therefore, this is not a new finding however it endorses the existing finding and also shows that this was also true in the case of Pakistan.

2.2 Technology Enhances the Learning Process

Apart from a single outlier, all principals discussed that technology significantly contributed towards better learning in various ways. Principal (E) remarked that technology enriches the experience of learning. Principal (A) explained that if technology is handled well then it enhances the process of teaching and learning by helping with understanding various topics and concepts more effectively. One of the participants (I) commented that he had seen a drastic improvement in students' learning outcomes. This claim was mainly based on feedback from students and teachers using technology in classrooms.

> *(F): "The main benefit is children love it, the audio visual impact that would give them impression on their minds to make their learning easier, faster, more interesting, more meaningful. It will not just be book or chalk and talk, it's wonderful. I think the retention is also better."*

The above statement contains a number of reasons why principals value technology and similar reasons were given by several other principals. There was a very strong focus on how children love learning with technologies and enjoy it more compared to the traditional chalk and talk model. The principals believed that this kept students interested in the topic and hence leads to better comprehension.

Another important element that contributes to amplifying student learning, which was repeatedly mentioned in the interviews was visualization.

> *(D):"It facilitates understanding. Sometimes when you show models, 3D models, animation; it helps derive the point forward."*

However, Principal (A) thought otherwise. He discussed how technology was not the only way to visualize concepts. He gave his own example from when he was a math teacher and he would find it more effective to teach using physical 3 dimensional shapes and object.

The principals indicated that the one of the most unique features about new educational software is that it has facilitated student learning by providing

opportunities for, what they called as, individualization. Principal (N)discussed about students who are weak in math:

> *"We can plug these kids in individual programs for extra support, the students can move at their own pace, they don't have to please the teachers and if they are struggling they can try the task multiple times without anyone frowning at them".*

Other uses of technology discovered during the interviews were that they provide a platform for collaboration with students from different countries, which provides new exposure to learn from (D). Principal (I) believed that technologies help with boosting creativity and imagination while developing higher order skills.

All of the benefits discussed by the principals were aligned with previous research. It could be seen that Pakistani principals gave extra importance to the idea that students loved technology. However, researchers in the past have not explicitly discussed this special attraction that students have towards technology. The idea of individualization was not specifically found during the literature review, but the concept of student-centred learning mentioned by Sanchez & Aleman (2011) encompasses it.

2.3 A Tool for Effective Communication

More than half the principals interviewed praised digital technologies as a tool for effective and efficient communication. These principals viewed that the increase in the availability and existence of digital technologies has significantly made all sorts of communication much easier and faster for schools. Mainly three types of communication were mentioned: school's internal communication; communication with parents; and communication with the students. Principal (E) also mentioned an exchange of communication with other schools.

> *(G): "The other advantage is communication. Communication is key, is quicker and you've got all sorts of variety and forms such as twitter and blogs, but you've also got straight forward ways like emails. To me, it is a great advantage, it's a lot quicker a lot more immediate".*

The interviews revealed that technology was used significantly for communication between the principal, the departments, the co-coordinators, teachers and other members of the staff.

Principals (L) and (K) explained that whatever useful resources they would find online; they would share them with relevant teachers over email. They added that emailing was also used by the teachers to share their lesson plans with the department heads and principals. Principal (M) mentioned that most teachers now were active on WhatsApp and had made groups to communicate with each other, however none of the schools had any officially mandated WhatsApp groups.

The principals claimed that the evolution of digital technologies has inaugurated new platforms to interact with students' parents. They mentioned that earlier it was a difficult task to get a message across to all parents.

> *O: "In Pakistan we have numerous last minute holidays, there use to me so much uncertainty among the parents until we got active on Twitter. It has never been easier to notify parents."*

> *(E): "It's now much easier for the parents to approach the school through email, without physically showing up. These online forums are also being used to keep the parents up-to-date with the progress of their children."*

> *(J): "Edmodo (an online program) has created good communication between parents, teachers and children. And they know exactly what's going on".*

The interviews revealed that over these past few years out-of-class interaction between teachers and students has significantly increased. The primary credit for this escalation goes to various social media channels. Principals stated that most teachers are constantly available to their students through Facebook and WhatsApp, and some teachers have made WhatsApp groups with their students. Principal D unveiled that in his school, students do not need to take any notes in class, as each day study notes are sent to them via email. Some of the schools email the homework to the students.

> *(E): "Even now the teachers are online with the students so that they can give assignments and students can do from home and post it to the teacher and teacher will respond to it accordingly".*

Hepp et al. (2004) discussed in their paper that technology has made communication between the school and parents quite efficient and easy. They also stated that information circulation within the school is also heavily dependent on digital technologies now. Reid (2002) indicated that interaction between the teachers and student has also increased due to these technologies. Our findings from the interviews are quite similar to what the literature states, however, the principals we interviewed viewed this change in communication as radically positive and emphasized it greatly, much more than the literature. The common use of WhatsApp groups for teachers and students' communication was a novel finding.

2.4 Administrative Role over Pedagogical Role

Two principals explicitly opined that technology had a bigger and more important role to play in school administration compared to pedagogy. Eight other principals also discussed the integral role played by digital technologies in managing the schools. However, other principals did not mention any administrative use of digital technologies during the interviews.

> *(D): "I think the role of educational technology in my experience has been much stronger in terms of administration of schools than as a medium of teaching."*

> *(G): "We found that there is a lot of data mining that can be done in terms of tracking student progress, counselling, understanding students better, and for decision making purposes based on the data."*

Principal (G) also stated that he uses especially designed school management applications on his iPad for observing and evaluating classes/lessons. Only three principals mentioned data mining and analysis as a potential benefit of technology. Most other principals who discussed the administrative role of technologies mainly focused on uses such as preparation of worksheets and exam papers, planning of lessons and timetables, accounting and finances, managing students' records and electronic attendance systems and for external and internal communication.

Principal (E) explained that greater efficiency can be achieved by using computers for administrative purposes. She stated: "Let's say, I want to send a lesson plan to assessment coordinator, it goes by email, she makes the corrections and I get it back within an hour. With hard copies it might have taken an hour to make the hard copy reach her, given the size of our school."

Principal (B) believed that using these technologies for school management can also help save paper and other resources, hence it is environmentally friendly.

Although several researchers (such as Reid, 2002 and Collins, 1991) have mentioned the administrative role technologies play in schools, not one of the authors discussed it to be more important than the pedagogical role. In our research, we unveiled that Pakistani private school heads gave immense important to digital technologies for school management, few of them even went as far as claiming that technology was more suitable and useful for school administration.

2.5 Technology is Not Only Positive

Apart from two principals, who believed that technology had no drawbacks, all the other participants expressed that if not handled properly, technology can have negative outcomes as well. There were several different negative aspects of technology discussed by the various principals, however, none of them viewed that technology's negative influences can outweigh the positives it has to offer. Most principals constantly reinforced the idea that the outcomes of technology are dependent on how it was used.

> *(K): "It all depends on how you design it, how you use it and what you do with it!"*

> *(M): "Technology is a tool; it's not bad on its own the main thing is how you make use of it".*

A phrase used by Principal (D) was aligned with the previous quote: "*The tool should be dependent on the job, not the job on the tool*."

A number of principals expressed that technology in many cases is being used for the sake of it, or even as a marketing point.

> *(B): "Oh, Tech has just become a selling point for these schools".*

The principals believed that when technology is used without a specific purpose, then the outcomes are also meaningless. Over-reliance and overuse of technology was also discussed, as it could lead to several problems.

A potential problem frequently mentioned during the interviews was the negative effect overuse of technology can have on the health of children. It was discussed that excess screen time is harmful for children. School heads also felt that physical activity is decreasing due to technology and people are becoming lazier.

> *(I): "You see these days most youngsters are moving away from physical activities and sports and going towards more computer systems, they are not understanding the dangers of it".*

It was uncovered during the interviews that majority of principals considered paper and pen to be the essence of education - technology replacing paper, pen and the book was seen as a potential drawback by most principals. To emphasize on the essentiality of traditional educational instruments, Principal (N) presented an interesting scenario:

> *"For a computer you need electricity, you need to charge a computer. If you stranded in a crash or in a jungle, your cell phone and your computer will last you a very short time. But your pen and paper is there with you. So, you can never get rid of it and you should not."*

Furthermore, principals also viewed that technology is negatively impacting students' handwriting skills, spellings and vocabulary, which from their point of view will be an irreparable loss. Principal (G) suggested that skills such as numeracy and literacy were on the decline. In addition to this, several school leaders also mentioned that "Generation Z" is not aware of the etiquettes of e-communication:

> *(A): "They email you in texting style English; they don't write full sentences or even full words, I mean that's how you message your friends, not email your principal."*

Another potential negative effect perceived by the principals was that technology is altering the way students think and work. They explained that students of today are always looking for quick solutions - they blamed the internet and especially Google for the trend.

> *(L): "These kids love shortcuts, they don't want to think, for them education means Google it, copy it and paste it. I mean who will read and understand what's written. Trust me, they can't even read a full book now".*

Other principals also claimed that technology was making these children hyper, distracted and restless. In connection with this, the issue of plagiarism was mentioned. The principals commonly believed that plagiarism has increased as a result of everything being searched online. They further added that as the teachers are not tech savvy, they can many times not check if a student has copied something from the internet and represented it as original work.

Misuse of technologies was also viewed as a major issue. Principals believed that students could waste time playing games on tablets or computers. They were also worried about inappropriate content available online, due to which they stressed the importance of monitoring children while using technologies. It was mentioned in section 4.2.1 that some principals believed that smartphones held a great potential for student learning, however, were not being used in schools as a learning tool. In fact, most schools had banned phones inside schools. In addition to the danger of wasting time and accessing inappropriate content, the principals explained that it was tougher to monitor smart phones. Two principals mentioned cases where students had used the phone cameras to take inappropriate pictures of girls and shared them around.

Other potential drawbacks mentioned were that technology could hamper privacy and increase cyber bullying. Principal (D) stated that sometimes technology can make lessons too fast for students to follow. He gave an example of a teacher who would always use PowerPoint slides to teach, but students later complained that she just reads through them and moves to the next slide too fast. Principal (H) forwarded the view that overuse of technology can even make lessons more boring.

Most drawbacks covered in the literature and mentioned during the interviews were similar. However, the fact that technology was dependent on external factors such as power supply, was not mentioned anywhere in the literature. The decline in vocabulary, handwriting and other similar skills due to increased use of technology was also a drawback of technology that was freshly discovered and not found in previous popular literature.

2.6 The Human Touch

The notion of human touch was mentioned by every single participant of our research. That is the reason I devoted an entire individual category to it, though it was a fragment of the negative aspects of digital technology. They all strongly believed that the biggest potential drawback technology can cause is the decline in social interaction and capabilities.

> *(C): "The component of technology I am most worried about and feel very strongly about it that it might replace the basics of Education. Look, the key thing is socialization, the key thing is discipline, the key thing is human touch and you just cannot take them away from education."*

The educators claimed that the rise in the use of technology needs to be critically evaluated. An overdependence on technology can drastically decrease social skills, reduce integration between human beings and hamper teamwork (F). The principals viewed education to be a social process, a process full of interaction between human beings, between students and teachers. They thought that any decrease in human interaction and engagement will be a grave loss. It was discussed that technology, if overused can suppress the emotional development of children. A number of principals explained that they can already observe a decline in social capabilities of the new generation.

> *(K):"They can text on WhatsApp for hours, but they can't sit and talk for minutes, these new gadgets are like growths on their ears and hands."*

Other principals also stated that the human touch and human connection is gradually being lost. The reason given by Principal (A) for this was that students spend half their life around technologies.

Most principals were openly against the idea of distance learning and exclusively virtual education. They especially mentioned that the idea of lessons via Skype or other online platforms is not something they supported. However, the educators clarified that it was not a problem if a teacher was present in class and a short part of the lesson was conducted by an expert through an online session. There was a very special focus on the teacher's presence in classrooms.

> *(J): "We have been teaching for centuries without these gadgets, we can still teach without them. But education without a physically present human teacher, that will never happen."*

The school heads explained that distance education creates too much of a divide. They further added a classroom should never be overshadowed by technology.

> *(H): "I see that sometimes connecting too much with technology, you disconnect with the society at large."*

This exact problem, that interaction with technology can negatively affect physical interaction with other human beings was also mentioned by Wang and Chan around 20 years ago. This shows that this negative impact of technology has existed and been identified quite long ago.

Distance learning possibilities due to the existence of digital technologies is commonly highlighted as a major advantage of technology in most previous research papers (Cassidy, 1998). However, we discovered that Pakistani school leaders did not perceive it to be a useful feature; in fact most of them viewed it to have a negative impact on the learning capabilities of school children.

3. Barriers to Technology Integration

3.1 Teacher Related Resistance

The interview process unveiled that there were several obstacles to technology introduction and integration. The barrier that was considered most noteworthy and was mentioned quite frequently was related to teachers' readiness and capabilities for incorporating digital technologies in their teaching techniques. This was described and discussed by the principals in various ways.

> *(A): "A board member suggested giving tablets to all the students when they join the school, I didn't agree with him. Not because tablets are not useful, but I think they would be such a waste because most teachers wouldn't have a clue about what to do with them"*

The principals explained that a substantial amount of teachers were not ready and capable to effectively integrate technology into their lessons. Principal (E) felt that teachers were not comfortable with using technology as a part of their pedagogy. Principals (F) and (N) were of the view that preparing for a technology-integrated lesson required more time - this extra effort discouraged some teachers from attempting to use technological devices while teaching. However, a number of principals perceived that in the long run it will save teachers effort and time as they can use the material several times.

Majority of principals expressed that teachers' professional development in regards to proficiency with the use of technologies was inadequate. Principals (G) and (A) complained that finding teachers who were competent users of technology was a major challenge in Pakistan. They, along with other principals, added that even many teachers who were trained to use computers for their personal use were not skilled enough to use peripherals efficiently as a teaching aid.

> *(B): "The number one dilemma of education in Pakistan is that we don't have teachers who are trained to teach; now I don't need to tell you that how tough it is to find teachers who can teach using technologies."*

The aforementioned thought was shared by other principals, and especially emphasized upon by principals(G), (K), (O) and (A).

Another issue repeatedly pointed out by the principals was the differences between the old and young teachers. Most principals categorically stated that older teachers were not tech savvy and hence quite reluctant and scared of using technology. These teachers were accustomed to traditional teaching practices and did not see the benefit of technology. On the other hand, the younger teachers were comparatively tech savvy and quite comfortable with integrating technologies in teaching. They would often experiment with new technologies and not resist the change.

> *(M): "Our best teachers are those who have studied abroad and come back for various reasons they want to teach because they have been exposed to different ways of being taught in class, including technology and also they have grown up with technology. I'd say the under 35 is way ahead of the rest."*

However, a few principals believed that as old teachers were mostly masters of their respective subjects due to experience, when they would use technology the outcomes would be better than younger teachers who incorporate technology. Some principals stated that the only major issue faced with many younger teachers was that they were lazy, and hence did not want to spend the extra time needed to plan the lesson with technology.

These educators believed that to overcome this barrier schools need to invest more in training for teachers. Two types of trainings were mentioned by the principals: generic technology training and teaching specific technology training. Most principals focused more on generic technology training. Nonetheless, a minority of principals mentioned that teaching specific training is essential, and is a major shortcoming right now.

> *(L): "You go for training; they just do the standard stuff, which is not adequate. I think, if you've got to train people with these things then you need hands on kind of experience and it really needs teachers rather than technical people to do the training so that they could give examples on how you can get the best out of it while teaching".*

The school heads also mentioned that apart from training, the teachers need to be continuously convinced, pushed, urged, and encouraged to use these technologies. Two principals also mentioned that peer mentoring was an efficient and sustainable solution. They added that there were some teachers, who were already proficient at using technologies, could be grouped with other less tech savvy teachers to help them.

It is pertinent to mention here that Principals (J) and (I) were two principals who did not view teachers to be an obstacle for technology integration. They stated that teachers were tech savvy and always willing to implement technologies. However, when they explained their notion of technological proficiency it was observed that they in their view teachers who could use word processing and emailing efficiently were tech savvy.

Lack of teachers' professional development has been commonly identified as a barrier in the literature available. It has been discussed in various papers that many teachers are not adequately trained to incorporate technologies in their teaching methods, and this is a major barrier to technology integration (Tondeur et al, 2010). However, this distinction in regards to technology usage between the old and the young teachers has not been discussed in the literature reviewed.

3.2 Technology is expensive

School leaders highlighted the financial constraints associated with investing in digital learning technologies and perceived it as a major barrier. The principals discussed various elements of these monetary concerns during the interviews. The issue was not equally serious for all schools, and was viewed quite differently by separate groups of principals. There were principals on both ends of the spectrum, principals who viewed cost to be the biggest barrier, and those who barely considered it to be a hindrance.

> *(H): "The biggest barrier is cost. Price of these hardware, their maintenance and then they have such a short life now. Even the software is not cheap, in fact sometimes the licenses are ridiculously expensive".*

This concern that technological peripherals and programs are expensive was shared by several interviewees. Principals (D) and (G) strongly focused on the issue of technologies becoming redundant, and explained that this significantly adds to the cost of integrating technologies. Principal (K) explained that limited budgets were available to spend on technology, and it was very difficult to distribute the budget between buying new technologies, maintaining current ones and replacing old devices. Principal (E) and (F) viewed cost to be a major barrier because the fee they charged was substantially lower compared to most other schools.

Principal (O), who ran a branch within a large school network, raised a concern that was not discussed by other principals. She explained that bureaucracy limited the funds available for technological spending as budget allocation was centralized through the head office within the school's organizational structure. She clarified that there are a lot of hierarchical issues involved, and getting funds sanctioned for a new technology can sometimes take a long time period.

Three principals (B; A; L) claimed that they had plenty of resources, and hence faced no cost related issues. Principal (A) explained that his school was a non-profit organization, and hence they had plenty to reinvest. However, even these principals at different points in the interview mentioned that technologies were expensive to buy and maintain.

Principal (N) had a very unique solution to this barrier. She claimed that whenever they want to introduce a new technology, the parents had to pay for it. She gave an example that they were introducing a new policy under which each student will have a laptop. She added that the parents were supposed to buy these laptops for their children. Principal (G) mentioned that they try to look online for free or cheaper software to use at their school, instead of buying expensive ones.

The cost factor was viewed as a significant barrier by a majority of Pakistani school leaders. However, though it has been mentioned in previous papers, it has not been given importance in previous studies, which contrasts with the way these principals emphasized upon it. Technologies being more expensive in Pakistan was a new and thought-provoking finding. Issues of hierarchy in bigger school systems causing

delays for new technology integration was also a finding which is not parallel to previous research conclusions.

3.3 School Culture

A barrier observed during the interviews was resistance to technology implementation due to schools' existing cultures. There were several aspects of the culture in these schools that hindered technology implementation or, at a minimum, did not complement technology integration.

A majority of principals mentioned that paper, pen and books are all viewed as the essence of education. Considerable importance is given to hand writing skills. The increase in technology usage is viewed to be a threat by many members of the educational field, as it endangers the existence of the fundamental educational tools. In regards to hand writing, there was extra importance attached to it as most final exams are entirely hand written.

> *(K): "The beauty of holding a book in your hand, the smell of book, the feel of the pages, the smoothness of the pen, it's a romance that you go through that we cannot have on these gadgets".*

Parents and many older teachers and educationists viewed that education is about learning concepts rather than understanding them. Grades are set on a very high pedestal, and it is believed that technology cannot support in achieving high scores in exams. This culture of rote learning repels the use of computers and other peripherals.

Traditional teaching practices widely existed. Teachers were most used to the chalk and talk model. Moreover, it was observed that there was a fear that technology will take over the teacher's job; this notion also added to the existing resistance from teachers. Principals (A) and (D) claimed that even some students prefer traditional teaching methods over the use of new devices, such as smart boards. However, this sort of student resistance was not mentioned by any other principal.

A structural issue in several schools was that IT was regarded primarily as an administrative tool. Another problem is the absence of a dedicated IT department, which can work towards promoting and supporting technology integration. However,

some schools had IT departments which were gradually designing plans and editing curriculum to integrate technology.

Another element of culture that limits technological use is the way educational technologies are viewed. It is widely believed that information technology is a subject in itself, hindering its use as a tool for teaching other subjects. Nonetheless, it is now gaining a popularity as a teaching tool, but most principals and teachers believe it to be only in sync and useful for teaching math and science. This limits its use across the curriculum.

Principal (B) viewed that many private schools are using technologies as a marketing tool that differentiates them from competitors. She remarked:

> *"Just because you own the best technology, you are not the best schools. But this is what they and many parents think."*

Hence, simply owning learning technologies was considered satisfactory at times, and resources were not allocated towards exploring how technology could best be used. Principal (F) expressed that technology is widely being used as a pleaser instead of a tool for better learning.

Robertson et al. (2006) argued in his paper that school cultures should be altered accordingly before a technology is introduced. If it is ignored than it can become a significant barrier. However, altering school culture is not an easy process and requires a team effort and significant time. The beliefs and assumptions held by many educationists and teachers in Pakistan regarding the essence of education and traditional teaching methods were not simple to change. Long-term change requires transformational leaders. These sort of beliefs and assumptions were not mentioned anywhere in the literature and hence there are no solutions proposed to deal with them.

3.4 Logistical Issues and Unreliable State Infrastructure

During the interviews the school heads mentioned some external and logistical barriers. These barriers were significantly affecting the use of digital technologies;

however, these factors were outside the scope of the schools' administrative influence.

> *(P): "I don't think the infrastructure is really, let's say robust enough in Pakistan, it's not reliable enough, you have to have really reliable infrastructure to successfully employ technologies for teaching. The providers of these internet services are not always reliable, the computer technicians are not dependable, electric supply is not constant, it's a disaster!"*

A majority of principals viewed state infrastructure as a major problem. They referred to the lack of reliable Internet connections and inadequate supply of electricity. The educationists explained that all digital technologies relied upon electricity, whereas many also needed Internet access to operate effectively. However, most of these schools had electricity generators to counter the problem of inconsistent electric supply. Principal (H) and (I) did not consider access to the Internet to be a barrier, as they believed that there were plenty of Internet providers available and you just needed to find the right one.

Availability of educational software, especially localized software was also pointed out as a negative contributor towards technology implementation. Principals (J) and (C) believed that various modern gadgets were not even available or unreasonably expensive in Pakistan. Another concern that many principals had was a lack of technicians who could maintain and operate peripherals successfully. These various availability issues add up to the hindrances faced while implementing technologies in Pakistani schools.

A concern mentioned by Principal (M) was security related. She stressed that in Pakistan it was not considered safe to carry expensive devices. Hence, giving laptops or tablets to teachers or students was not feasible.

As there was a major lack in the literature available on technologies in Pakistani private schools, these findings regarding the principals' view on Pakistani infrastructure are fresh and conspicuous. Other findings regarding scarce availability of new software, hardware and technical experts is also not parallel to any finding from the literature.

4. Ancillary Discussion

Most of the findings have been discussed in the three previous sections and have been compared to the literature where relevant. However, a few findings were exceptionally compelling and unusual, hence, deserved to be separately highlighted and critically discussed.

The majority of principals had a positive view towards the integration of digital technologies in schools. They believed that the world was changing and it was essential to stay up-to-date and prepare students for the future. At this point, there are two noteworthy questions that need to be addressed. Firstly, since the principals are arguably not proficient at using these technologies and have limited knowledge of it, one would ask the reason behind such a positive attitude? The second question that arises is about the fact that when the current workforce was studying at school, these technologies were not present and thus they were not accustomed to use them, yet many of them are adept at using them, so is the argument that today's students need to be prepared for tomorrow's workforce justified?

Another thought-provoking revelation was that although principals had limited knowledge about the technologies themselves, they placed a very important value on them and identified several benefits that technology integration had to offer the school. These benefits included access to unlimited information and resources, but most principals did not name any specific software or websites that were used at their schools. It could be inferred that these positive views were mainly based on the feedback they had received from certain teachers or colleagues and were not based on their personal experience.

A very special emphasis was placed on students' love for technology as a reason for improving student learning outcomes. However, as students become more and more accustomed to technologies, this benefit which is considered one of the foremost advantages of technology by several principals might disappear. However, individualization was a very unique benefit identified during the research, and this might increase over time as technologies develop even more.

The findings unveiled the notion that these principals considered digital technologies to be more useful for communication and administration purposes than for pedagogy. As it was observed that several principals considered their role as administrators and decision makers, this might have been a reason due to which they viewed technology as an administrative tool.

During the interviews, when principals were expressing their views on technology they discussed various benefits, but except for one, no school head mentioned drawbacks of technology unless they were specifically asked for it. Even then, two principals believed that there could be no possible disadvantage of using technologies in schools. This indicated an absence of a critical stance. It is pertinent to mention here that most principals discussed that the outcomes of technology depended mainly on how it was handled. This is a major point mentioned by many scholars regarding technology integration that particular attention must be paid to the way technologies are designed and implemented.

Another compelling finding was that technology was being used by some school as a unique selling point. This shows that parents are overly positive about technology, hence, a school offering more technology based learning was considered to be a better school.

During the interviews, each school head frequently mentioned that technology can never replace teachers, and there is no education without teachers. Although, no remark was made by me during the interview which could have indicated that technology will substitute teachers. It is still unknown why principals automatically thought that technology was being developed to replace teachers.

Several principals mentioned that the biggest barrier to technology integration was resistance from teachers. They explained that there was a significant lack in professional development of teachers with regards to technology. Most principals viewed that training was essential, however, it was surprising to see that very few schools offered opportunities for technology training, and even fewer offer teaching specific technology training programs or arrangements.

School culture was mentioned to be another factor that played a noteworthy role in limiting technology integration. Traditional teaching methods were prevalent; it was found that in addition to the teachers even some students preferred traditional teaching over technology based lessons. This finding is directly in contrast with Marc Prensky's theory of digital natives, which claims that the current generation of students is so deeply engaged with technology that it can only learn through technology-based teaching techniques.

Although principals viewed technology positively, they felt that it might replace teachers or books, pen and paper, which were considered to be the essence of education by many principals. This conflict between their own opinions also might have added to the barriers. In addition to this, as most principals are arguably not proficient at using technology; they cannot be exemplary leaders and promote technology actively. The literature revealed that if a principal is comfortable and proficient at using technology, it acts as a positive externality for the entire school, especially the teachers.

A potential case of cognitive dissonance among principals can be inferred from these findings, which provides scope for future research in the field. The school heads need to find a way to align their views, beliefs, actions and practices.

Chapter 5. Conclusion

1. Conclusions

The interview based case study examined the views and experiences of Pakistani private principals regarding the integration of digital technologies. After a comprehensive review of the literature and analysis of 16 semi-structured interviews, it was deduced that the principals of Pakistani private schools predominantly had a quite positive perception of educational technologies and attached substantial value to these digital peripherals and programs. Nonetheless, it was also discovered that a majority of these principals believed that technology could have certain drawbacks if it was overused or not utilized appropriately. Based on the research, several factors were identified that played a role in limiting the integration of these technologies in educational institutes.

It was revealed that the principals believed that technology integration was important as technology was a practical need of current times. The principals' viewed educational technologies positively even though their knowledge and experience with technologies was limited. Three types of relationships between teachers and technology introduction were identified: technology introduced based on teachers' attitude and skills; technology provided independent of teachers' competence; and technology forced upon teachers. The overall process of technology integration was viewed in various ways by the principals and several complexities were involved in the manner it was implemented.

Technology was valued mainly for four broad reasons by the principals. The first reason was the abundance of information and resources provided by technology for teaching and learning purposes. The second major potential benefit of technology identified was that it played a crucial role in enhancing student learning by making lessons more interesting while providing opportunities for visualization, interactivity and individualization. The third value attached to digital technologies by principals was that it is a key tool for effective and efficient communication between the school, parents and students. A majority of principals believed that technology had an imperative role to play in school management; two principals even claimed that this administrative role was bigger than any other role technology played in schools.

The research also discovered that although principals viewed technology to be very beneficial for the schools, they considered that if these peripherals were not used appropriately then there will be negative effects. The main negative effect pointed out was that overreliance on technology can lead to a loss in social interaction, which is a vital part of education and personal development.

Four main categories of barriers were unveiled through the study. The first and most frequently mentioned barrier was related to teachers' capability to employ digital technologies effectively, a particular emphasis was on old teachers. Another significant barrier discussed was the cost of buying and maintaining hardware and software. The third obstacle was the school culture, which was heavily influenced by traditional views and practices. The last barrier identified was the state infrastructure, which included unreliable internet, electricity and availability of technical support.

It can be observed that several benefits, drawbacks and barriers were parallel to the ones addressed by the literature. Based on this it can be inferred that there were certain similarities in how educational technology was viewed in developed countries and in the private schools of developing countries. However, unreliable local infrastructure was a barrier which was not found in the literature. This is a noteworthy contribution of this research.

2. Future Directions and Limitations

This research has laid down a foundation for further enquiry into the topic which was previously unexplored. The findings of this research can be used to advance similar studies in different cities of Pakistan or other developing countries. Comparable research can also be carried out on teachers in similar contexts, and the findings of those studies can be compared to our findings to understand the wider case. Observation methods can be used in addition to this study in private schools of Karachi to gain a deeper understanding of the issue.

Further research can also be carried out on the principals of private schools in Karachi to specifically explore the reasons behind the positive attitude of school heads towards technology integration. Quantitative research can be carried out on the benefits identified through this research to better evaluate the impact of technologies.

Similarly, deeper research can be carried out on understanding each barrier that has been unveiled by this study.

This study revealed various key perceptions regarding technology in Pakistani private schools, but it is essential to highlight the limitations of the study. Firstly, this research focused solely on the views of principals; neither teachers nor students were part of the scope of our study. This might have limited the effectiveness of our study as we were not able to compare the perceptions of different stakeholders to understand the scenario in a more holistic manner. Another shortcoming of the study is that it was only conducted in one city of Pakistan, however, it was the largest city and the demographics of all urban cities of Pakistan are similar. The only research tool employed was interviews, this might have been another limitation of the study, but getting access to schools in Pakistan for observational purposes is not easily possible. The study revealed the findings from 16 schools; it would have anyway not been possible to visit sixteen schools for observations. All of the above limitations were mainly due to scarcity of time to complete the research project.

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APPENDIX

Appendix 1. Interview Guideline

- Few basic questions about the background of the principal and the school including a very short history

- What are your educational aims for student learning?

- What is your view/knowledge on educational technologies for pedagogy? What concept do you have of technology integration in teaching practices?

- What education technologiesare being used in your school?Why and how were they chosen, designed and implemented?What is your role/motivation/reason or the steps you took in implementing these technologies?

- What are the main barriers faced when implementing a technology?

- What training and education was given to the teachers regarding these technologies?

- Are your decisions regarding the introduction of a new technology into your system influenced by other factors such as government policy, financiers' notification, parents or teachers' suggestions, etc.?

- What are thebenefits of using these technologies? What are the potential benefits that you perceive might occur in the near future?

- What are the disadvantages you see of using these technologies?

- What technology would you want to introduce or removein the future? Why?

Appendix 2. CUREC Approval

From: Liam Gearon
Sent: Tuesday, March 29, 2016 11:18 AM
To: [redacted]; Education Research Office
Cc: Education Research Office; Niall Winters
Subject: RE: Curec form MSc Education (Learning & Technology)

Role of Educational Technologies in elite Pakistani schools

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical approval of all research involving human participants.

I am pleased to inform you that, on the basis of the information provided to DREC, the proposed research has been judged as meeting appropriate ethical standards, and accordingly, approval has been granted.

If your research involves participants whose ability to give free and informed consent is in question (this includes those under 18 and vulnerable adults), then it is advisable to read the following NSPCC professional reporting requirements for cases of suspected abuse

http://www.nspcc.org.uk/globalassets/documents/information-service/factsheet-child-abuse-reporting-requirements-professionals.pdf

Should there be any subsequent changes to the project which raise ethical issues not covered in the original application you should submit details toresearch.office@education.ox.ac.uk for consideration.

Good luck with your research study.

Kind regards

Dr Liam Francis Gearon
Senior Research Fellow
Harris Manchester College
University of Oxford

Associate Professor
Department of Education
University of Oxford

Conjoint (Full) Professor, School of Humanities and Social Science,
Newcastle University, Australia

Adjunct Professor, Australian Catholic University

Appendix 3. Interview Invitation Email

University of Oxford
Department of Education
15 Norham Gardens, Oxford, OX2 6PY

Dear Sir/Madam,

I am a candidate for **MSc Education** (Learning & Technology) at the **University of Oxford**. My tentative research project focuses on the **use of technology in Pakistani schools.**

For this research project I wish to study **school principal's perceptions and views regarding technology integration in schools**. Therefore, I need to **interview** a few principals of Pakistani schools.

I wish to conduct these interviews in **the month April, 2016**. I would be grateful if you could take the time out from your busy schedule to give this interview.

Awaiting your reply,

Thanks and Regards,

[redacted]

Appendix 4. Consent Form

Consent Form

University of Oxford
Department of Education
15 Norham Gardens, Oxford, OX2 6PY

STUDY TITLE: Role of Educational Technologies in elite Pakistani schools

RESEARCHER DETAILS: [redacted], M Sc Student ([redacted])

PURPOSE OF STUDY: The primary of aim of this research is to study and comprehend the role of technology in pedagogical practices in private Pakistani schools.

participant initials each box

1. I have read the study information sheet and had the opportunity to ask questions about the study and have received satisfactory answers from the interviewer (researcher). ☐
2. I understand that this project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee. ☐
3. I understand that my participation is voluntary and that I am are free to withdraw myself or my data at any time, without giving any reason, and without any adverse consequences. ☐
4. I understand that only the researchers will have access to the data I provided. ☐
5. I understand that all data will be secured in password protected devices and will be number coded. These devices will be owned by the researcher and not shared with anyone. I understand that complete confidentiality and anonymity will be maintained. ☐
6. I understand that the research will be saved in University of Oxford archives and may even be published at a later stage. ☐
7. I understand how to raise concerns or make a complaint. ☐
8. I have given my consent to being audio recorded. ☐
9. I agree to take part in the study. ☐

Name of Participant: _____

Signature: _____ Date: _____

Name of researcher: _____

Signature: _____ Date: _____

Appendix 5.Participant Information Sheet

University of Oxford
Department of Education
15 Norham Gardens, Oxford, OX2 6PY

Participant Information Sheet

1. **Study title**
   Role of Educational Technologies in elite Pakistani schools

2. **Background and aims of the study**
   I, [redacted] am an MSc Education candidate at the department of Education. My pathway is Learning & Technology ([redacted]). The primary aim of this research is to study and comprehend the role of technology in pedagogical practices in private Pakistani schools. We aim to investigate the awareness and integration of technology and technological peripherals in these schools. In addition, we also intend to observe the attitude and view towards educational technologies. Our project will focus on the perspective of school heads/principals.

3. **Why have I been invited to take part?**
   The main reason you have been invited to take part in these interviews is because you are the principal of an elite private school in Pakistan, and the research project focuses on the views of principals regarding technology use in Pakistani schools.

4. **Do I have to take part?**
   There is no compulsion on you to take part in this study, and even after agreeing to it you will have the right to withdraw from the study at any time. However, it would be highly appreciated if you accept our invitation and participate in the interview.

5. **What will happen in the study?**
   If you agree to giving the interview, you will have to sign a formal consent form just before the interview. This consent form will include all information that is important for you and the researcher to be aware of. The only thing you will be required to do is participate in a one on one interview with the researcher. The interview will not take more than 1 hour and will be held at your school.

6. **Are there any potential risks in taking part?**
   This will be a very straight forward interview and will not relate to any personal or controversial issues that might affect you in anyway. There is no potential risk in taking part in this research. All your data will be saved securely, and anonymity and confidentiality will be strictly maintained.

7. **What happens to the research data provided?**
   All your data will be secured in password protected devices and will be number coded. These devices will be owned by me and not shared with anyone. Only the team of researchers would have access to this data. Your name will not be mentioned and therefore there is no risk of any information being leaked. If you are quoted somewhere it will be made sure that a code number of a fake name is used. The results will be used in a Master's dissertation.

8. Will the research be published?

The research might at a later stage be printed in a journal. However, the university will have hard and soft copies of this research in the archives. The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme. Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research.

If you agree to participate in this project, the research will be written up as a thesis. On successful submission of the thesis, it will be deposited both in print and online in the University archives, to facilitate its use in future research.

9. Who has reviewed this project?

This project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee.

10. Who do I contact if I have a concern about the study or I wish to complain?

If you have a concern about any aspect of this project, please speak to the relevant researcher [redacted] the research supervisor (Niall Winters, niall.winters@education.ox.ac.uk), who will do his best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how he intends to deal with it. If you remain unhappy or wish to make a formal complaint, please contact the chair of the Research Ethics Committee at the University of Oxford (using the contact details below) who will seek to resolve the matter in a reasonably expeditious manner.

- Chair, **Social Sciences & Humanities Inter-Divisional Research Ethics Committee**; Email: ethics@socsci.ox.ac.uk; Address: Research Services, University of Oxford, Wellington Square, Oxford OX1 2JD