Impact of Digital Practices on Pre and Primary School Children's Grades

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Abstract: *This study investigates the impact of digital practices at home and school on children's grades in pre and primary schools in Saudi Arabia. Data was collected through two questionnaires targeting parent's guardians and teachers. The study reveals that the use of technology in specific subjects at home and school significantly influences student's grades.*

Keywords: Digital Practices, Home and School, Children's Grades, Pre and Primary Schools

1. Introduction

Technology can be considered as a tool that humans can manufacture from resources of nature as a result of their thoughts and their needs as innovations, inventions and changes to achieve longer life with more production (Dugger, 2001).

A number of points can be extracted from the above consideration of technology. First, technology includes a wide range of devices that can be not only used for educational or communications purposes, but also for applications in daily life from items such as televisions, computers, e-mail and the internet to transportation and integrated industrial systems (Custer, 1999). However, some researchers define technology only in terms of computers and communications (Selfe, 1999). Second, there is a close relationship that exists between technology and science despite the differences between them (Sanders 1999). Both have different scopes and operate within different notions and strategies but each of them depends on the other; whereby technology can employ to generate sciences and knowledge, scientific knowledge is used to find solutions for real life problems where technology was created to solve them. (Bybee 2000).

Research has called to keep pace of using technology with the appropriate developmental stage of each child, support teachers by providing proper tools to reach effective uses of technology, and develop potential opportunities to integrate technology into the curriculum (NAEYC & Fred Rogers Center 2012).

However, the role of technology in improving the educational process is still a subject of debate. For example researchers such as Stephen and Plowman (2002) and Byron (2008) have raised the following concerns about children's safety while using technology:

- Possible unhealthy physical impacts.
- Extent of children's learning, and the other aspects of the child's development: cognitive, social, and emotional.
- Engaging in unsafe content.
- Using new technologies instead of essential learning and play activities.

NAEYC (1994) argued that watching violence on TV may increase aggressive behaviour in children, and using media in early years may cause attention problems. Hamel and Rideout, 2006 put forward that parents had concerns about whether they can manage the amount of time that children engage in technology in their later life. They also have concerns about cartoons that may broadcast violence and misbehaviour, and the potential impacts on their child's behaviour such as drifting in their own imaginative practices (NAEYC, 1994; Hamel and Rideout, 2006). With regards to how much time children spend using technology, some studies have reported that children between two and five spend more than thirty-two hours weekly in front of a screen (McDonough, 2009), while Levin (2013) mentioned that besides sleeping spending too much time in front of screens, is considered to be the activity that is most done by children. Other research has concluded that fifty-two percent of children from birth to eight are able to access a tablet, smart phone, or other electronic device (Guernsey, 2012). However, there are contrasting arguments regarding such media. While some professionals warn that technological media may affect the time children spend with their parents, or physical activities and other creative activities, the producers of children's programs argue that children can learn even at the earliest years through their programs (NAEYC and the Fred Rogers Center, 2012).

In fact, research has reported that integrated technology resources, such as laptops, iPad, interactive white boards, and mobile devices, in classroom become an important aspect of teaching and learning processes (Almekhlafi and Almeqdadi, 2010; Albugami and Ahmed, 2015). Possible reasons for this include that of technology resources enabling students to engage actively in the learning process more than with traditional classroom resources, where students play a passive role as just observers and listeners (Asenso-Okyere and Mekonnen, 2012). Other advantages related with the use technology in the classroom include the ability to "learn more in less time" and to allow "schools to focus on global learning environments if used appropriately. " (Almekhlafi and Almeqdadi, 2010: 165). Other advantages using technologies in education include the ability for technology to offer high quality education, encourage collaborative learning, provide students with skills for solving problem, provide more chances for flexible learning and playing a key role preparing students for the information era (Albirini, 2006; Almalki and Williams, 2012).

With regards to this study, a survey design was chosen to facilitate the task of this research: to identify the effects of techno-digital practices on children and to investigate the teachers' uses of technology in their classrooms at preschools and early stages in primary schools in Taif, a western city in Saudi Arabia. Two separate questionnaires were used in this study, namely a questionnaire for the parents/guardians of children at preschools and primary schools, and a questionnaire for the teachers of children at preschools and primary schools. The participant total for the questionnaires was 74 parents and in-service teachers. The paper concluded that there was considerable impact on children's grades through children's use of technology in the classroom and at home, and the extent of teachers' use of technology in the classroom.

2. Literature Review

The integrated presence of new technologies over the past twenty years has led to dramatic changes in our societies, and in our daily experiences (Yelland, 2014; 2011). The gradual technological progression and internet-based applications such as social media have significantly influenced the experiences of adults' lives, as well as that of children, whom as Marsh et al. (2005: 5) stated, are "immersed in practices related to popular culture, media and new technologies from birth". Children are considered to be active consumers through their routine use of different kinds of technology and media such as: technological toys, digital cameras, television with interactive features, mobile devices and DVD players (Vanderwater et al., 2007; Marsh, 2006). Amongst the advantages of such devices, it has been suggested that they may provide a platform to develop new skills and perspectives through engaging physically and intellectually with them in creative ways (Dede, 2007). Research has advocated this idea, suggesting that children interact actively with technology for several purposes; to solve problems collaboratively (Higgins et al., 2012) to initiate and guide various activities (Yelland 2014), and to combine their activity with different applications through portable devices such as iPads and iPhones (Edwards, 2013).

Using technology at Home-school

Although there is much research discussing the impact of learning with technology on children and their ability to engage in digital technologies (Miller & Robertson, 2011; Plowman et al., 2008), the literature on the potential link between children's home- school technology applications and their learning is still less explicit (O'Hara, 2011). The relationships between home and school on educational operation are considered to hold much importance (Marsh, 2003), so it is no surprise that attitudes towards the notion of 'digital-disconnect' between home and school would be sensitive (Levin & Arafeh, 2002).

The findings from a study conducted by Gronn et al. (2013) suggested that the generational viewpoints on using technologies in children's learning are instrumental in creating the concept of digital-disconnect, where digital engagement at home is more complicated and richer for children than at school. This view of children's experiences with technology is often based on the idea that they are seen as 'native users' of technology. For example, Oblinger and Oblinger (2005) labelled students who were born in the two last decades as the 'Net Generation' because of their ability to engage with the various forms of digital technologies. They described the Net Generation as those who have grown up in a digitally rich environment, and they appreciate experiential learning, working in teams and social networking. Moreover, they proposed that to achieve high levels of engagement and experiences of learning for this generation of students, digital technologies should be included within the educational curriculum and instruction.

On the other hand, the use of labels for children and technology has been contested in the literature. Selwyn (2009) provided an overview of the literature involving the notion of digital natives, in which he found that such terms expose moral and ideological debates rather than empirical substances over young people and digital technology that concern the interest of the children. Therefore, Selwyn (2009: 371) suggested to consider such terms " as a discursive than descriptive device, employed by those seeking to exert some form of power and control over the shaping of the digital (near) future". Similarly, Gronn et al. (2013) proposed that it is necessary to examine opinions and arguments that surround theories which discuss the 'Net Generation' and the 'generation gap', including the notion of 'digital natives' (Prensky, 2001), and considered these terms as being employed to create or transfer a worldview, which identifies children with technology in specific modes.

Jones et al. (2010) also considered these terms questionable according to what they considered rising theoretical and empirical evidence. They argue that young people are described as being a new generation that share common qualities as a consequence of the digital technologies and networked communication that surrounds them throughout their lives. They also concluded that these terms are based on a popular discourse which is repeated in the literature and policies about how young people use and share a preference for a range of technologies in learning. This idea is supported by Helsper and Eynon's (2010) findings that children are seen in a wide range of literature and policy as having experienced technology as part of their everyday lives, in comparison to almost all other generations.

Using technology in Saudi education

The Ministry of Education in Saudi Arabia is the official public service department of the kingdom, charged with overseeing the educational policy of the country and also responsible for equipping schools, providing educational materials, and supplying students with textbooks (Ministry of Education, 2005a).

Education is compulsory for all children between the ages of six to fifteen years and schooling is distributed between four stages. Children between the ages of three to six have

the option of attending kindergarten pre-schools. As part of compulsory education, children between the ages of six and twelve attend primary schools. Finally, teenagers between the ages of twelve and fifteen, and fifteen and eighteen attend intermediate and secondary schools respectively (Ministry of Education, 2005b).

Policy by the Ministry of Education focuses on the principle of education for all and promotes education in general and higher education to eliminate illiteracy among Saudi adults. It also sets fundamental standards within the educational systems for both public and private schools and oversees special education for the handicapped. All of which are in correspondence with the religious, economic, and social needs of the country. Thus, the existence of the technology revolution and its incorporation in most schools around the world brought a need for further development in the educational system (Ministry of Economy and Planning, 2010; Saudi Cultural Mission to the United States of America, 2013).

Technology began to be included in the Saudi education system in 1980 (Oyaid, 2009) before the Ministry of Education included it as part of the teaching and learning process in 1990 (Al-Khathlan, 2007). The integration of technology in Saudi education can be divided into two phases:

The first phase: Technologies was taught in Saudi special advanced secondary schools as an optional subject from 1985. Then in 1991 the Ministry of Education introduced technologies studies in all secondary schools as a compulsory subject. Since 1999, Technologies has been part of the curriculum at both primary and secondary stages as an optional subject. However, most of the technologies training programs are targeted towards students at secondary school, while various training courses are inclusive of both teachers and students (Oyiad, 2009).

The second phase: After the orientation of Ministry of Education to enhance the infrastructure of information and communication technology and to increase its role in education, learning technologies was incorporated into many subjects in the curriculum (General Directorate for Planning, 2005).

Government educational policy has aimed to supply necessary hardware and software to schools, as well as providing appropriate training programs to those responsible with the application of technology in schools, such as teachers and principals (Oyaid, 2009). Furthermore, Albugami and Ahmed (2015) reported that the Saudi government had recently taken enormous steps with regards to the implementation of technology, by providing a huge budget to support developments such as enhancing the curriculum and introducing electronic devices in education to facilitate teaching.

Tatweer (2015) also reported that these steps also included training and development courses to instruct teachers on how technologies can be used effectively in education.

However, despite these developments and governmental support, there exists a gap between the technological resources available in schools and the methods of implementation (Oyaid, 2009), highlighting the need planning for efficient strategy to integrate technologies in education and to apply it in the reality (Albugami and Ahmed, 2015). This aligns with the issue that the Saudi government has given significant attention to improve technology use in the education process within the secondary sector, while the primary stage has not received similar efforts, and as a result, primary teachers have not received enough preparation for using technologies in their teaching (Al Mulhim, 2013).

Furthermore, Valentine et al. (2005) asserted that there are numerous benefits of using technology, particularly for doing school work at home, which included: increasing pupils' confidence, raising motivation, inserting excitement to school work, improving children's perceptions of achievement, saving time, and handling multi-tasks via technology to improve children grades.

3. Methodology

Research Design and Methods

There are various research designs that are utilised in the field of social sciences. Examples of such designs include the use of surveys, interviews, questionnaires, experimental research and action research, and their selection is determined according to the purpose of the study (Cohen et al., 2007). Likewise, for this research, the quantitative approach was employed. Cohen and Manion (1980) described quantitative studies as social research where researchers use empirical methods and empirical statements to demonstrate that those statements and methods are descriptive reports of what "is" a case in the "real world", rather than what the case should to be. Empirical statements are presented in numerical terms. Also, empirical evaluations are used to determine the degree of achieving specific standards or norms empirically through a specific program or policy (Sukamolson, 2010). A quantitative approach to research was taken to identify the effects of techno-digital practices on children at preschools and early stages in primary schools in Taif, a western city in Saudi Arabia. The main source of quantitative data in this study was obtained through the use of a survey method.

Participants and Setting

This study employed online survey data collected from 31 teachers of preschools and early stages of primary level who taught children from the ages of 4 to 9 years old, as well as 43 parents. Participants were recruited from public and private preschools and primary schools in Taif, Saudi Arabia.

Participants were all connected on a social media messaging program (WhatsApp Messenger) and were encouraged to participate by messages within a purposely-created group on this program. The participants represented 19 schools in the west educational zone of

Taif. As schools in Saudi Arabia are single-sex, this research included schools from both boys and girls. The majority of educators who took part in the survey were males (60%) from boys schools and the average age of the children that the participants taught was 6 years, with an age range from 4 to 9 years.

The use of WhatsApp

WhatsApp essentially means "What's new?" and comes from the English phrase "What's up?". The program is one of the many instant messaging applications for smartphones. Written messages, as well as images, videos, and audio can be exchanged between users via WhatsApp whilst connected to internet. Therefore, it depends on an active Wi-Fi network, which makes it a good choice to employ instead of SMS messaging, which can be very expensive (Barhoumi, 2015).

Nicholson (2011) suggested that social media is a tool used by people to share stories and influence each other. Regarding WhatsApp specifically, (Binti Mistar, 2016: 98) describes the program as "a popular smartphone application that is rated as a great societal connection that connects individuals to get and share the humongous worldwide information rapidly". Furthermore, it could be used by all ages and backgrounds on the grounds of the relatively easy operation of WhatsApp service. Thus, by using this application through a smartphone everyone can communicate with other easily. (Binti Mistar, 2016).

The importance of using WhatsApp instant messaging in this study was that through WhatsApp's instant messaging platform, information and knowledge could be easily constructed and shared (Barhoumi, 2015). It enabled the creation of a separate WhatsApp group for the participants, so the researcher could communication with them effectively.

Data collection

In this study, 19 primary schools and preschools (5 private and 14 public schools) responded to the questionnaire after receiving formal permission from the Education Administration of Taif. Table 1 demonstrates that the sample represents approximately 15% of both private and public schools in Taif.

Table 1: Participated Schools and Kindergarten

Type of school and Kindergarten	Total		Sample	
	Girls' schools	Boys' schools	Girls' schools	Boys' schools
Public	51	48	7	7
Private	11	9	2	3
Private and public	62	57	9	10
Total	119		19	

Lists of parents and the educators that worked with children aged from 4-9 years were obtained through the head teachers in both types of school. Data from the Taif schools was collected within a period of three weeks, and formed the quantitative data required for the study.

Data Analysis

The data collected from the questionnaire elements were analysed using SPSS 23. Statistical analysis was used in order to do different descriptive statistics on the data collected. In addition, mixed effect models were run on the data with the dependent variable, *hours of usage per day*, and the fixed factors *digital resources (*smart phones/tablets/laptops) and *group (*Boys/girls).

Research Limitations

Collecting data through the use of questionnaires in this study was geographically limited to Saudi primary schools in Taif City in Saudi Arabia. As a postgraduate student, the researcher had limited time and resources that did not enable to collect data from other cities or even from rural areas affiliated to Taif city, and which would have been possible to get in-depth data to increase the current results and to ascertain if the study's results could be generalised across the country. However, because a such strategy would require a great cost in terms of time and money, which is not possible for a small study such as the current one, it was considered necessary to choose only Taif City instead of selecting a sample from schools in other cities and towns.

4.Findings

The data collected from the surveys was analysed and categorised. For the sake of a more methodological analysis, the data were classified into two main divisions: (a) teachers' surveys and (b) parents' surveys.

Figure 1 shows the response rate from the parents' population compared with that from the teachers' population. It is clear that parents were the more responsive. It was noticeable that if parents had an interest in the topic, they were more likely to participate. Therefore, in such families their children's use of technologies may be different to others in the wider community (Marsh et al., 2005).

Out of the 74 participants in the survey, parents' participation reached a total of 57%, where 34% of the participants were girls' parents and 23% were boys' parents. In terms of the teacher participants, female teacher participation reached 16% of the total population, while 27% were male teachers.
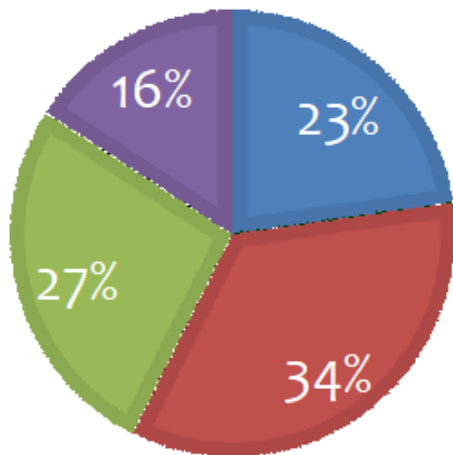
Figure 1: The response rate

The data from both the teacher surveys and parent surveys were divided into two subsections, and grouped into two different tables: a boys group and a girls group, with each group containing six questions. The findings contained several comparisons between boys and girls within each of the points in both surveys. Both of these surveys were being related to exploring the attitudes of teachers and parents towards the impact of using technology in children's grades.

Parent surveys

There were 43 parents engaged in this survey. The survey was designed with six items that aimed to investigate parents' attitudes towards the extent of using technology by children and how it impacts on their grades.

The parents' questionnaires included: 17 volunteers from the parents of boys and 26 from the parents of girls. The children of both sets of volunteers were aged between 4-9 years.

In relation to questions 1 and 2, *"Does your child use interactive technological resources at home?* and *" How long does he/she use them per day? And how long does your child use them to study per day?"*, results indicated that all children in both the boys and girls groups use technologies at home, except for one child from girls group. This represents a high percentage (97.6%) of technology use amongst the children, which supports findings from other research reporting that "children today are the most media literate of any generation (Dodge, 2008: 226) ", whereby they might spend a lot of time with technology and more than they spend with other activities (Dodge, 2008). Investigation into the time that children spend using technology found that boys spent an average of nearly three hours and 15 minutes each day engaged with the resources such as laptops, tablets and smartphones. Similarly, girls spent an average of nearly three hours and 30 minutes each day engaged with the same resources. With regards to the boys group, the most hours were spent on the use of tablets, then on smart phones, and finally, laptops (see figure 2). While the girls group preferred to spend the most time on using smart phones, then on tablets, and finally, laptops (see figure 3).

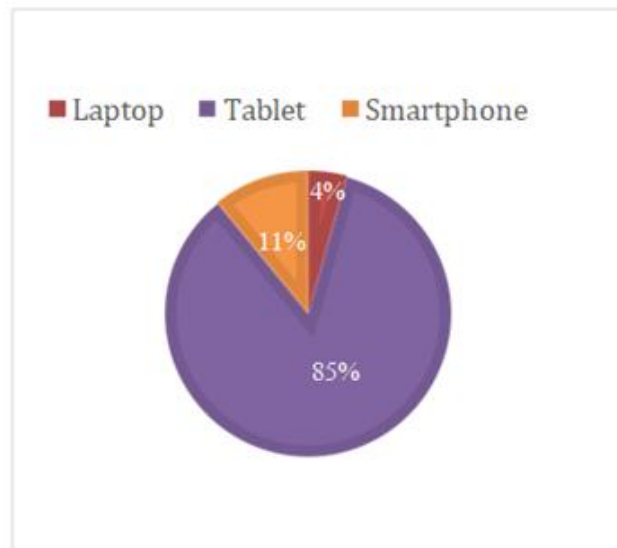Therefore, for both of the groups, laptops use was less than other resources.

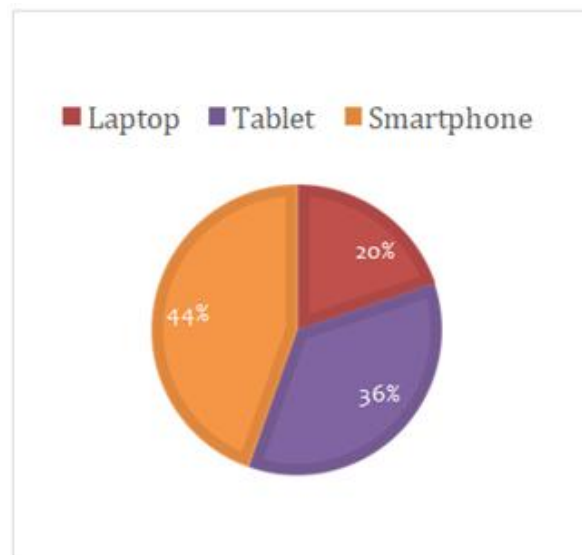**Figure 2:** Boy's use of different digital resources at home

Figure 3: Girls' use of different digital resources at home

These results were demonstrated by the following statistical analysis. Mixed effect models were run on the data with the dependent variable, *hours of usage per day*, and the fixed factors *digital resources (*smart phones/tablets/laptops) and *group (*Boys/girls).

Table 2: Means of number of the daily usage hours of the digital resources reported by groups (SD in parentheses).

Group	Digital resource			Total mean of usage hours
	Smartphone	Tablet	Laptop	
Mean for boys	1.66(1.15)	3(1.02)	0.75(.35)	1.8 (.84)
Mean for girls	1.60(1.18)	1.63(1.95)	2(.7)	1.74(1.27)
Total	1.61	2.37	1.64	

Table 2 shows that the means of daily usage hours of smart phones in both girls and boys are almost similar at around 1.6 with a standard deviation at around 1.1 whereas the differences are larger in terms of using tablets and laptops. The boy's mean of using tablets is 3 hours which is higher than the girls' group which is only 1.63. In using laptops, the table shows that the girls mean is 2 hours and this is higher than the boys mean that is only 0.75.

The results from the answers to question 3, *"What kind of technological resources (laptops, tablets or smart phones) does your child use the most?"*, showed that tablet most used technological resource for the boys group (13 boys), while laptop and smart phone had the same totals (2 boys each), where in fact one child used tablets and smartphone equally. As for the girls group, the results were as follows: 14 chose smartphones, 11 for tablets and 5 laptops.

**Table 3:** Digital resources use by boys in percentages

Boys	Frequency	Percent	Valid Percent	Cumulative Percent
Laptop	2	11.1	11.1	11.1
Tablet	13	72.2	72.2	83.3
Smartphone	3	16.7	16.7	100.0
Total	18	100.0	100.0	
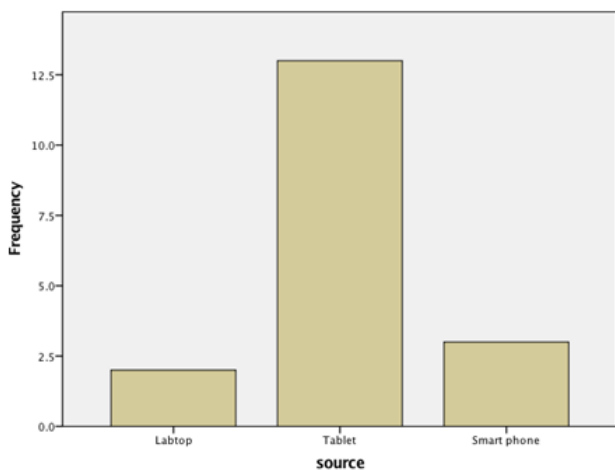
Figure 4: Frequency of Digital resources use by boys

Table 5: Digital resources use by girls in percentages

Girls	Frequency	Percent	Valid Percent	Cumulative Percent
Laptop	5	16.7	16.7	16.7
Tablet	11	36.7	36.7	53.3
Smartphone	14	46.7	46.7	100.0
Total	30	100.0	100.0	
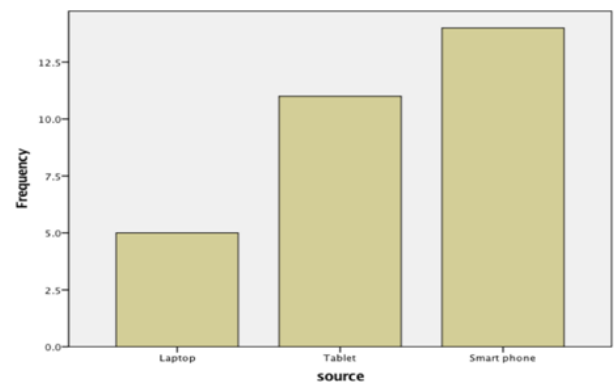
Figure 5: Frequency of digital resources use by girls

It can be seen from the results of this question that there was a significant difference between the numbers of boys (3) and girls (13) who used smartphones the most.

These accounted for the following percentages: 46.7% for girls and 16.7% for boys. On the other hand, laptops and tablets had more convergent figures.

With regards to question 4, *"Does your child use technological device to do school homework?"*, results showed that a 42% from the girls group who employ technology in their completion of homework. This represented a greater proportion than the 35% of the boys group.

5. Discussion

The results from the two sets of surveys in this study provided much information to be able to provide understanding related to the following research questions:

To what extent is technology employed in Saudi primary schools? To what extent is technology used by students at home?

A- To what extent is technology employed in Saudi primary schools?

This part of the study sought to investigate the teachers' uses of technology in their classrooms. The results found that all of the teachers who participated in the study use technology in their classroom. This agreed with the trend of the government of Saudi Arabia, as represented by the Ministry of Education, in investing to improve the educational system, particularly with the existence of the technology revolution (Ministry of Economy and Planning, 2010) and its integration into most of the education systems around the world.

Al-Zaidiyeen et al. (2010) and others (Venkatesh et al., 2003; Albirini, 2006) argued that teachers' acceptance, as well as their frequency of technology use in their classes,

reflect their attitudes towards technology. This is also supported by the theory of Acceptance and Use of Technology, which hypothesized four direct elements for stimulating people to accept and use technology in their work. The first of these elements, is the extent of the user's belief in the desired benefit of technology for them in their work environment. The second element includes the extent of the expected efforts and the extent of the ease in technology use. The third element is the extent of the influence of the social environment in changing a person's understanding towards using technology. The final element is the extent of user's belief that the technology that is being employed depends on a qualified organisational and technical infrastructure.

B- To what extent is technology used by students at home?

Research questions in the parents' survey aimed to investigate the extent of technology use by their children and the impact of their uses on the grades of the children. The findings revealed a high percentage (97.6%) of technology use amongst the children. Children are perceived within a wide range of literature and policy as active consumers of technology in their everyday lives (Marsh et al., 2005; Vanderwater et al., 2007; Marsh, 2006; Helsper and Eynon, 2010; Dodge, 2008). Although the percentage of the children's use of technology was very high (97.6%) among both boys and girls, the aims of technology use varied. The majority of boys had very low amounts of technology use for educational purposes. This was further illustrated in the proportions found for using technology at home or studying, where 42% of the girls group used technology for such a purpose, while only 29% of the boys group chose to do so. In the comparison of gender, similar findings were observed in another study that had noted that girls used technology more than boys at home for school work, which shows their more conscientious realisation towards education (Valentine et al., 2005). On the other hand, boys mostly use ICT at home for leisure or for preference for ICT itself, which lead to a negative impact on their educational attainment (Valentine et al., 2005).

Valentine et al. (2005) suggested several barriers that hinder children in using technology for educational purposes: the absence of teacher's guidance about how to do so; the weakness of confidence in the ability to use technology; the tendencies of children towards just specific subjects and negligence the others; the limitations of using technology in both home and school (e. g. inability accessing to internet, lack of providing computers or other equipment; lack of training courses of how use technology etc). Another obstacle children faced with reference to using technology in general was parents' concern, amplified by 'media panics' of negative impacts on children's social and cognitive development (Cohen, 1987; Kenway and Bullen, 2001).

6. Conclusion

To conclude this research, a summary of the preceding chapters will be presented followed by a brief discussion on the associated recommendations.

This study sought to investigate the question: *what is the impact of digital practices at home and school on children's grades at pre-and primary schools in Saudi Arabia?*

The literature related to this research presented the following various important ideas: The integrated presence of new technologies over the past two decades have influenced our daily lives and indeed our society (Yelland, 2014; 2011). Research also suggested that technology has a significant influence on the experiences of adults' lives, as well as children (Marsh et al., 2005). Furthermore, a number of studies (Dede, 2007; Higgins et al., 2012; Edwards, 2013; Yelland, 2014) have indicated that technology use in children encouraged the development of new skills through engaging physically and intellectually with them; solving problems collaboratively to initiate and guide various activities and to combine their activity with different applications through various devices such as laptops and iPhones.

The importance of the relationship between home-school on the educational operation has ensured that a sensitive attitude towards the notion of 'digital-disconnect' is maintained (Levin and Arafeh, 2002). A study conducted by Levin & Arafeh (2002) reported that the majority of students use the internet mostly outside of school. They also suggested that this was contrary to what they mentioned earlier in their study about conventional wisdom that said schools should be the center of using educational internet.

The primary reason for the 'digital-disconnect' between home and school according to many researchers (Levin & Arafeh, 2002; Somekh et al., 2002; Dodge et al., 2008) are that children have a greater diversity of technology choices at home and an easier access to the technology, while school classrooms depend on print materials produced by curricular experts and teacher centered pedagogies.

Marsh et al. (2005) attempted to display the evidences of how children could engage, understand and create a range of communications, and to determine the extent to which those practices are supported by parents and early years educators (Marsh et al, 2005: p.10-11). Whilst Cohen (1987) suggested that 'moral panics' was one of the main factors which caused confusion and negativity for parents and educators that then served to ignore young children's experiences in this area. Some of these concerns were based on the emotional, social and cognitive development of children that may be negatively affected by using media produced by international companies where children become economic goals (Kenway and Bullen, 2001).

Bulfin and North (2007), Dyson (1997) and Somekh et al. (2002) drew attention to the focus on the home-school relationships as a useful tool in negotiating young people's technology practices. For example, In the study of Somekh et al. (2002), students viewed all ICT use at home as 'games' where learning was frequently through their

use of ICT for leisure activities. Although, research since 2005 has investigated formal and informal learning settings, such as home and school in relation to technology uses, there is a lack of research available on children's experiences of technology at home and school together from the findings of systematic empirical studies (Vourloumi, 2015).

It is important to reflect on the significance of the findings of this research and acknowledges its limitations. Although the findings supported a positive a impact of digital practices at home and school on children's grades at pre-and primary schools in Saudi Arabia, there was scope for further investigation on technology to distinguish technology use from other factors that could have affected grades. Also, the relatively small sample size used limits generalisation of the findings, but it is the hope that this research provides encouragement for further research on this topic.

7. Recommendations

A number of recommendations have arisen stemming from the findings of this study and its derived conclusions. These concern strategies that can be implemented by policy makers, schools, and teachers and parents of children aged between 4-9, to ensure the success of using technology in education.

The Ministry of Education in Saudi Arabia should develop efficient training courses for all teachers on the effective use and management of technology in their teaching to ensure equal learning opportunities for all students. They should also allocate adequate funding for the design and enhancement of software and applications that help enrich teachers to achieve the aims and objectives of the curriculums.

Schools should actively use technology to support home school links and to support and build on the use of technology by their students at home for homework and studying. Schools should aim to resolve digital gap issues with regards to students' confidence to use the technology, the extent of activating technology in classrooms, and the extent of reducing the gap between the usages of technology at home and school. They should also provide planned time for teachers with respect to their workloads/time management in order to embrace training opportunities to develop their skills in using technology.

Teachers should clarify for students the disadvantages of leisurely uses of technology and encourage them to do school work at home by using technology, and to invest using technology in leisure time for educational purposes. Similarly, parents should monitor their children while using technology and encourage use for educational purposes.

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