



# The use of touch-screen tablets in early childhood: Children's knowledge, skills, and attitudes towards tablet technology



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## ABSTRACT

Touch-screen tablets are rapidly increasing in popularity and widespread use. They are entertaining, attractive, and potentially powerful learning tools for young children. This study reports on a qualitative research exploring how children use touch-screen tablets in Jordan in particular, and what implications this may have for learning and teaching in early years. A total of forty K-2 children participated in the study (M child age = 6.27 years). Semi-structured interviews and structured observation were utilized. The results indicate that overall, children had reasonable knowledge of touch-screen tablets and their features. Children viewed touch-screen tablets as an entertaining tool more than as a learning tool. Moreover, touch-screen tablets were used for different purposes with 'playing games' being the most common purpose, followed by watching YouTube. In addition, children were found to acquire most of the skills needed to use tablets, but still not in control in some cases. It was found that gaming and entertainment apps on the touch-screen tablets replaced the traditional play-based activities used in early years. Finally, the children expressed that their parents impose rules regarding tablet usage and they need help and guidance from their parents while using tablets. The study concludes with a discussion of what the findings might mean for current policy and practice.

## 1. Introduction and background

Many children live in technology-based communities in which exposure to mobile devices is increasingly prevalent (McManis & Gunnewig, 2012). In this technological era, mobile computing (e.g., smartphones, e-readers, and touch-screen tablets) is becoming widely used among people of different ages. Among available mobile devices, the touch-screen tablets (e.g., iPads, Blackberry Playbook, Android tablets, etc): in particular, are a crucial type of technology, leading growth in the mobile technology sector (Chen, Chang, & Wang, 2008; Puschel, 2012), and such devices are most popular among children (Rideout, 2013). Touch-based features of the tablet make it increasingly affordable and easy to use in schools as an instrumental learning tool compared to previously used technologies (Reychav & Wu, 2015; Shuler, Winters, et al., 2013). It also offers the potential for educational applications (Terras & Ramsay, 2012). Thus, schools can provide children with innovative ways to use this technology and stakeholders are urged to reap its benefits.

A number of studies have shown that touch-screen tablets have the potential to provide young children with valuable learning experiences that enhance their learning and development (Beschorner & Hutchison, 2013; Clarke & Abbott, 2016). Tablets increase children's

understanding of the learning process (Pellerin, 2012; Snell & Snell-Siddle, 2013; van 't Hooft, 2013), support children's metacognitive skills development or 'learning to learn' skills (Wong, 2012), and allow children to create original works as a means of personal expression, as well as to provide opportunities for peer collaboration (Couse & Chen, 2010). Furthermore, the advantages of tablet usage are emphasized in other research studies such as Shuler et al. (2013) who stated the role of tablets in encouraging children's independent learning and facilitating access to personalized learning content. Several researchers (Clarke & Abbott, 2016; Couse & Chen, 2010) have found that using tablets develops motivation and persistence in solving tasks among children. Evidence also highlighted the role of tablets in reinforcing children's interest and determination in completing tasks without feeling frustrated (Couse & Chen, 2010). Due to their portable nature, tablets allow learning to be accessible anytime, anywhere and across context and geographies, as well as to be easily accessed outside classrooms (van 't Hooft, 2013; Wong, 2012).

Moreover, tablet technology has been found to have a positive impact on developing children's early literacy skills (Crescenzi, Jewitt, & Price, 2014; Flewitt, 2012; Neumann, 2014) as well as children's acquisition of a second language (Pellerin, 2012). In addition, various studies have linked children's gains in structural knowledge, problem-

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solving skills, writing and drawing skills as well as in letter and number recognition to the use of tablet technology in education (Couse & Chen, 2010; Neumann, 2014).

Against this background, researchers (e.g. Churchill, Fox, & King, 2012; Resnick, 1998) have found that technology and digital media have abstract nature and they may introduce children to advanced concepts that are developmentally inappropriate to their age group. In addition, no definitive evidence of the benefits of many digital media products designed for young children as they have not been assessed in terms of their appropriateness to young children's age group (Lieberman, Bates, & So, 2009). Thus, the present article is an attempt to study one of these digital technologies in Jordanian context to shed some light on how children use touch-screen tablets and what knowledge, skills, and attitudes they gain in relation to using this digital technology.

### 1.1. Theoretical underpinning

Touch-screen tablets are rapidly increasing in popularity and have become common in education due to their movability and touch-based features, their overall low cost compared to computers, as well as children's preference to use touch-driven and interactive technology (Shuler, 2009). Children can learn to use touch-screen tablets quickly, independently, and confidently, showing freedom of exploration (Couse & Chen, 2010). Unlike traditional desktop and/or laptop computers, tablet technology is becoming easier for young children to use because of the technology's smaller size and touch-screens, as these features allow direct manipulation (Tootell, Plumb, Hadfield, & Dawson, 2013). Thus, early years settings have started to accept the growing mobile culture and have integrated this technology into the learning and teaching process.

Blackwell, Lauricella, and Wartella (2016) pointed out that increases in tablet computer access among early childhood educators shifted policy recommendations that recognize the importance of this technology to young children's learning and development. Based on these shifting perspectives concerning using general technology in early years, tablets have been viewed as particularly appropriate in early childhood stage. In the United States, 98% of children aged 8 and below live in a home with some types of mobile devices, 95% of families with children have a smartphone, and 78% have a tablet device. The report shows that 42% of children have their own tablet, and they spend an average of approximately (2:15) hours a day with screen media (Rideout, 2017).

Teacher characteristics (attitudes, self-efficacy, pedagogy, etc.) are important regarding the integration of tablet technology into early years education (Van De Bogart, 2012). Nevertheless, the success of this integration depends on a range of interrelated factors including but not limited to the quality of the educational content available, the internet connectivity and bandwidth, and school leadership and vision. The literature suggests that educational technology needs to be developmentally appropriate for the children, and includes tools that assist teachers using technology successfully and can be integrated into classroom and curriculum (NAEYC & Fred Rogers Center, 2012). Researchers identified six developmental abilities and reference categories associated with using tablets such as "motor skills, approaches to exploration, game concept, generalization of skills, preferences for activities and designs and comprehension of app interface" (Michael Cohen Group LLC, 2007).

Research indicated that children become more independent and seek less support and teaching from adults once they acquire the necessary knowledge of tablet computers (Couse & Chen, 2010). As a part of the evaluation activities of the US Department of Education Ready to Learn (RTL) Program, Cohen, Hadley, and Frank (2012) indicated that children learn and explore in natural ways when using touch-screen technology as they learn by trial and error and repeating, accompanied with interest and engagement.

Using tablet technology was not limited to schools; it is also used at

home, in what is currently considered as a 'digitally fluent home' (Palaioiougou, 2016). At home environments, children engage in a variety of tablet applications (apps), which refer to the software programs downloaded on mobile devices. Michael Cohen Group and U.S. Department of Education (2011) reported that preschool children's tablets use at home could be categorized into six apps; 1) gaming apps (75%), 2) literacy apps (55%), 3) creating apps (49%), 4) mathematics apps (37%), 5) e-book apps (27%), and 6) educational apps (24%). The same results were also found in the work of Marsh et al. (2015) who explored the common tablets apps or activities used by children aged 0–5 while using their iPads at homes and revealed that playing games apps was the most common.

Despite tablets' positive and negative impact on children's learning and development, one can notice that touch-screen tablets have become popular in education in most western countries including the United States. The idea of using tablets in education in most Arab countries is a relatively new trend. It has become common that children, at school age and under, use tablets in their home environments. However, there are gaps in our knowledge regarding how children use tablet technology and what knowledge and attitudes they have towards it. The current study adds to the body of literature by exploring children's knowledge, skills and attitudes towards this digital technology in Jordan which is different from the other countries both culturally and economically.

### 1.2. The study context

Over the past three years, the prevalence of touch-screen tablets, as emerging media platforms, have increased rapidly in the Jordanian homes. Recent statistics have revealed that 5% of Jordanian children own touch-screen tablets (Department of Statistics, 2013). Some Jordanian families buy tablets for their children at an early age, especially in the middle-class families. The results of the survey in the information and communications report, issued by the Jordanian Department of Statistics (2013), revealed that the use of desktop and laptop computers at homes has decreased since 2011, from 61% to 57% (Department of Statistics, 2013). This is attributed to families' desire to own mobile devices, such as touch-screen tablets and smartphones because of their cheap prices when compared to traditional desktop and laptop computers (Qunaibi, 2016).

In the Jordanian educational context, touch-screen tablets are not widely used in most schools, despite the fact that computers and other related-technology devices are becoming increasingly common and are employed in most Jordanian public schools. Since 2011, several Jordanian schools (mainly the private schools) have begun to using tablets in their educational system. In practice, some private schools have replaced the textbook with electronic books, while others have abandoned school bags because of tablets (Qunaibi, 2016). Thus, parents of children have become interested in enrolling their children in schools that adopt tablet technology in their educational system, as they expect this is to have positive benefits for their children's learning.

The number of schools employing tablet technology is expected to increase drastically in the future years since the Ministry of Education (MOE), in collaboration with UNICEF and the private sector, has launched its 'Digital Schools Program' to provide disadvantaged children with advanced technology including tablets and other devices (UNICEF- Jordan, 2015). Despite improvement in this field, the status of children's tablet use is still problematic as little is known about what knowledge and attitudes children have towards touch-screen tablets, what tablet apps do they engage with, how they use tablets, and what role parents have is in this process.

In Jordan, research studies on using tablet technology have been limited to middle and high school students (Abed Al-Latif, 2015; Qunaibi, 2016), while there have been no studies performed on primary and preschool children. Therefore, little is known about the tablet technology, its apps, and its usage as viewed by one of the central groups in the field- young children. Indeed, the adoption of tablet

technology in some Jordanian schools and the increasing use of this technology in children's home environments have created the need to explore how tablets are used among Jordanian children and what their knowledge, skills, and attitudes towards this technology are. To tackle this issue, this study was designed and carried out.

### 1.3. Research questions

The study attempted to focus on the following research questions.

- How do children use touch-screen tablet technology?
- What is the level of children's knowledge and skills in relation to touch-screen tablets?
- What are children's attitudes towards touch-screen tablets?
- How do children perceive the parents' role in supporting their tablet use?

## 2. Method

### 2.1. Subjects

The study sample included forty children enrolled in K-2 (kindergarten, first, and second grades). Three kindergartens and seven primary schools were randomly selected from two regions in Jordan (Amman and Zarqa). Four children from each kindergarten and school ( $n = 40$ ) were chosen purposefully to participate in the study. The children chosen were those who owned a tablet device or used a tablet in their home environment or school. Children involved in this study were from three educational levels: kindergarten ( $n = 13$ ) aged 4–5 years, first grade ( $n = 13$ ) aged 6–7 years, and second grade ( $n = 14$ ) aged 7–8 years. The participants ranged from 4 to 7 years of age, mean child age was 6.27 years. Eighteen children were boys, while 22 were girls.

### 2.2. Research instruments

#### 2.2.1. Interview

A semi-structured interview was adopted and included open-ended questions so that children could express what they know and understand about tablet technology in their own words.

Interview questions included the following topics: (1) how and why children use touch-screen tablets; (2) children's knowledge of tablets; (3) children's attitudes towards tablets; (4) the most visited websites; (5) using social media tools, and (6) the role of parents in supporting children's tablet use.

#### 2.2.2. Observation

The researchers observed how children use touch-screen tablets. The intention of the observation was to get a general sense of the tablet skills that children acquired (e.g., starting a program, browsing pages, using social networking tools, downloading from the web, etc). Although the interview used in this study provides a detailed picture of children's knowledge and attitudes towards tablets, this, without observing how children use tablets, does not basically show their skills in using tablets. In this study, structured observation was utilized. The researchers developed an observation sheet to record certain tablet skills as acquired by children in general.

To verify the validity of the interview questions, the researchers presented them to a number of referees and asked for their comments and suggestions on each question and on the interview as a whole. As a result of their comments, minor changes were made to some questions. Overall, the external referees believed the interview questions to be fair measures of the target constructs. The interview was also field-tested in three school settings outside the sample of the study. Changes indicated by the field test were incorporated into the instrument development. Regarding the observation, the inter-rater reliability of the observation

was measured on seven children. Each child was observed by two raters (research assistants) who were trained on how to observe children's tablet use. The alpha score across two raters was 0.81 and was considered to be suitable for the purpose of this study.

### 2.3. Data collection

Before conducting the interview with children, consent was acquired from the Jordanian MOE, school principals, and the parents of children. The researchers conducted direct visits to the kindergartens and schools involved in the study, met with parents of children, explained to them the aims of the study, obtained their permission to interview and observe their child while using his/her tablets, and assured them about confidentiality and anonymity. Children were also encouraged to participate in the study. The researchers explained to children the research's aims and informed them that their participation was voluntary and that they had the right to leave the interview and/or observation and return to their classroom at any point during the interviews and observation.

Regarding the observation, each child was specifically asked to use tablets to show the skills that the researcher identified. Children were given the opportunity to bring their own tablet device or provide it to them. The interview and the observation with children were conducted individually and took place in their school settings. Each interview took around 20 min to administer, while each observation took about 15–20 min.

### 2.4. Data analyses

The current study utilized qualitative data analysis techniques. The interviews were the main source of qualitative data collection and they were recorded and transcribed. The responses were coded through pre-set and open processes. Before we collect data and establish code process, we began with a start list of pre-set coded driven from the theoretical framework and research questions (e.g., 'children's knowledge of tablets', 'using social media tools', the role of parents' etc). Later, these codes were developed into themes and headings, and the number of respondents who shared the same responses under each heading was calculated. Following this, quotes were selected from the interviews and used to support and develop the results. Moreover, the observations were analyzed separately using frequencies and percentages. The proportions were calculated based on the specific skills accomplished by the children.

## 3. Result

### 3.1. Children's tablet use

It was clear from the interview results that the children who participated in this study were aware of the tablet device in terms of its name and usage. They were also aware of branding, as some of them referred to the device brand and not to the name when they mentioned 'iPad' and 'Samsung Galaxy'. Most of the children indicated that they spend a great deal of time using a tablet. As some children do not accurately understand the concept of time, their answers varied from saying 'many hours' to 'a lot'. When asked to specify the time in hours, over half of the children indicated that they spend one to two hours a day. Eleven out of 40 participants said they spend 4 h. Only six children indicated that they use it very little, and for them, 'little' meant half an hour a day.

The results also revealed that a vast majority of children used tablets at home more than they did at school, as evidenced by the following statements: 'I use it at home and play on it every day'; 'I use it at home with my little sister'; and 'I am not allowed to take it outside so I use it always at home'.

In addition, most of the children mentioned that the school does not

allow children to use their own tablet nor allow bringing it to school. For example, one child stated, *'My school refuses to let me bring my iPad to the classroom'*. Another explained, *'If any child brings it, then the school takes it and does not give it back to him'*. Those children mentioned that they did not learn their lessons in school using tablets. Against this background, seven children indicated that they sometimes used tablets at school to learn about numbers and letters: *'We have a computer corner in the classroom and we use tablets to learn Arabic alphabets'*; *'I play with my colleagues on the tablet in the classroom'*; *'teachers ask us to practice "tables of times" on the tablet'*. However, three children mentioned that they use the tablet everywhere at home, in the gardens, and even in the car. One child said, *'My iPad is with me all the time'*. Another added, *'When my father drops me at school, I carry it with me and I love to use it always in my father's car'*.

### 3.2. The purpose of using tablets

It was clear that the children were using their tablet devices for different purposes. The majority of the children indicated that they spend a great deal of time playing games on tablets. Over half of the children indicated that they use tablets to watch cartoons or movies on YouTube. Sixteen children indicated that they used them to do their homework, while 12 children mentioned that they use them as a research tool to visit websites using Google and other search engines. Ten children mentioned that they use their tablets to memorize the Holy Quran. Examples of their responses are presented here:

*'I play games on my tablet'*; *'Watching YouTube on it is my favorite thing about a tablet'*; *'I used my iPad to do my homework'*; *'I google things I need to know about'*; *'I listen to the Quran from my tablet, and I practice memorizing it every day'*; and *'I love to download gaming apps'*.

### 3.3. Children's attitudes towards using tablets

The children all reported positive attitudes towards tablet use, as they viewed tablets as enjoyable and interactive tools. For example one child said, *'I feel happy and excited as I spend an enjoyable amount of time using my iPad'*. Another expressed, *'I really enjoy playing on [my tablet]'*. Other statements included *'it helped me memorize the Quran'*; *'I love to use it every day'*; and *'I know how to use it easily'*. When asked about what they preferred most, playing on their tablet or playing with their friends outside, most of the children reported preferring to play on their tablet devices. This was especially true for girls, as some boys preferred playing with peers outside. One girl said, *'I love playing on tablets more than anything else. I really enjoy it and I love to play [with my tablet] a lot'*. However, eight children said that they preferred to allocate part of their playtime to using a tablet and another part to playing outdoors with friends. Some children reported playing on tablets with their peers, as evidenced by the following statements: *'I sometimes invite my friends to play with me at home with our iPads'*; *'We play games on it and watch cartoon movies'*; *'I prefer to play both on the iPad and outside'*; and *'I play dressing up games [on my tablet] with my friend'*.

Of those children whose parents did not allow them to play, 11 children indicated that they would play with friends or with their toys instead. Some children (9 out of 40) indicated that they would watch television or visit websites on the computer. However, close to half of the children indicated that when they were prevented from playing on tablets, they often expressed their anger in different ways such as, crying, screaming, or not talking to anyone at home.

When asked about the most popular apps they prefer to use on the touch-screen tablets, most of the children indicated that they use gaming apps. However, the games favored by the children differed depending on gender; the girls preferred dressing up games, Frozen Freefall, Disney Princesses, and Barbie games, while the boys preferred car games, wrestling games, war games and amusement games such as Subway and Plants vs. Zombies. Moreover, about half of the children stated that they preferred to watch children's songs on YouTube, or to

watch Disney shows or cartoon movies.

However, 10 children indicated that they sometimes want to use educational apps at home, such as *Word Games*, *Alphabet Train*; or *My Fun Numbers*. They also used educational websites like 'Baraem tv' (a Qatari website) and Jordanian-based websites like Arab Child Web, Hatem Magazine, and (3safer). One child said, *'I love to watch the Baraem site because it has everything I love - stories, games, crossword; and puzzles'*.

The children reported visiting the following websites while using tablets: 1) the App Store by Apple or the Google Play Store (60%), which they used to download playing games; 2) YouTube website (25%), which they used to watch movies and cartoon programs and to listen to songs/music; 3) search engine websites like Google and Yahoo (8%), which they used to gather information; 4) educational websites (5%), which they used to learn their lessons; and 5) photo sites (2%), which they used to download photos.

When asked about the extent to which they download apps (e.g., apps for playing games, watching movies or listening songs) from the Internet, over half of the children indicated that they do not do so, and that their parents and older siblings do so for them. As one child explained, *'When I found an interesting app on my friend's iPad, I asked my dad to download it on mine'*. Similarly, another child said, *'My mummy downloaded many apps on my tablet so I can play on it when we do not have "Wi-Fi" at home'*. However, some children - particularly those in the second and third grades - reported that they downloaded apps themselves.

As for the apps that children were not allowed to use at home or school, most of the children indicated that they do not use social networking tools such as Facebook, Twitter, or Instagram. Others (12 out of 40) stated that they do not use their tablets to view horror or action movies, or to play war games, as these would not be age-appropriate. The following are some of the statements made by children on this topic: *'I'm not allowed to use Facebook'*; *'My mummy does not allow me to upload my photos to Instagram'*; *'My daddy uses Facebook and I found it unamusing'*; *'I do not like war games'*; *'I'm not allowed to watch YouTube alone'*; *'My parents do not want me to watch action movies'*; *'I should not watch horror movies on YouTube'*; and *'I am still too little to use Instagram'*.

### 3.4. What is children's knowledge of tablets?

It seems that children had fair knowledge of touch-screen tablets. When children asked about the things that tablets brought them, their responses differed according to the different uses and purposes of the tablet. Most of the children indicated that the tablet devices brought them new games and allowed them to download games and photos. The following are examples of their responses: *'The tablet allows us to play games'*, *'I download gaming apps through it'*; *'It has YouTube'*; *'It has games, photos, and many apps'*; and *'It helps me to learn multiplication and to memorize the Quran'*.

Most of the children indicated that the tablet can bring them enjoyment and everything that makes them happy and have fun. However, it seems that their responses reflected the notion that "feeling happy" and "having fun" are closely associated with the idea of playing games: *'Tablet makes us feel happy'*, *'I have fun with it'*, *'I enjoy all apps'*.

In most of the children's views, the bad apps linked with the tablet are playing games that are boring and not entertaining. Close to half of children believe that fighting, wrestling, and horror games are bad apps found in the tablet: *'There are unpleasant games which I do not like it'*; *'I do not play the Plants vs. Zombies game and wrestling games'*; *'My friend always plays fighting games that I do not like'*.

It was also noticed that most of the children are aware of how tablet devices are connected to the Internet. They are also aware of the concept of the Internet: *'The Internet downloads playing games'*; *'The internet brings news'*; *'We watch YouTube when the Internet is on'*. Regarding how to connect their tablets to the Internet, most of the children mentioned that they run the Wi-Fi and then set the password, while some children

mentioned that their parents are the ones who launch it for them. One child stated: *'In the beginning, and before I use the tablet, I look at the Wi-Fi signal and ensured it is on. If it is not, I click on it and the Wi-Fi runs and hence the Internet works'*.

### 3.5. Children's tablet skills

Children were observed while playing on their own tablet devices. The results indicated that most of children acquired the main skills needed to use tablets. Frequencies and percentages were used to reveal the tablet skills that children master. It has been noted that the most commonly acquired skills were: 1) scrolls with ones' finger up and down to browse pages (100%), 2) opens and shuts the device (95%), 3) recognizes the popular icons (93%), and 4) starts a program (93%).

Moreover, they were found to master the following skills with a moderate percentage: opens YouTube alone to watch movie (78%), selects and starts a game of one's choice (73%), starts the Internet alone to search for something (73%), and plays games according to the game's rules (65%). However, it was found that percentages of downloading from the web and using social media tools were low since the percentages of using these skills were 45% and 37%, respectively.

### 3.6. Parents' role in children's tablet use from the children's views

Nearly, half of the children mentioned that they use their tablets with their parents or older siblings, particularly when they are guided to how a game works or when apps are downloaded. Over half of children mentioned that they need their parents to provide them with help and guide them while using tablet devices. Examples of children's responses included *'When I open YouTube, my mother types for me what I want to watch'; 'I do not know how to download apps so I ask my mummy to do it for me'; 'I always ask my dad to watch me when I play "Candy Crush"; 'When I have many games apps on my tablet my mummy has to reset it'; and 'I always need my dad to type the Wi-Fi password'*. However, a few children indicated that they use the tablet alone, while three children refused to have anyone with them when using their iPads.

When asked about the apps, websites, or other tablet activities that the child visits or plays with their parents, most children have indicated that these activities were: YouTube website, playing games, downloading apps, or educational apps. However, a small number of children (4 out of 40) indicated that they use the tablet with their parents to study or complete homework.

Furthermore, the results indicated that the parents of the children imposed rules on their children when they use tablets. Most of the children stated that their parents assign them a certain amount of time while using tablet devices: *'my mother allows me to use my tablet for 1 hour every day'; 'I'm not allowed to use my iPod at all when I have exams'; 'my parents assign between half-an-hour to an hour a day for me'; 'I sometimes exceed my allocated time to use my tablet'; 'my mummy allows me to use my iPad up to no later than at 8:00 pm'*.

Most of the children interviewed revealed that their parents prohibit them from using some apps or websites. These apps were: Facebook, Instagram, horror movies, and fighting and war apps. However, most of the children mentioned that their parents ask them to alternate between using the tablet and studying.

## 4. Discussion

Touch-screen tablets have become more relevant in all aspects of everyday life, with a significant impact on education and have additionally become a more common part of early years classrooms (Neumann, 2018). Research studies have highlighted the positive impact that tablets have on children's learning and development (Clarke & Abbott, 2016; Reychav & Wu, 2015; Terras & Ramsay, 2012; van 't Hooft, 2013; Wong, 2012). Therefore, exploring children's knowledge, skills, and attitudes towards touch-screen tablets constituted the

primary aims of the present study. The results indicated that children had fair knowledge of touch-screen tablets and their features. In Jordan, touch-screen tablets have become widespread over the past few years and are not limited exclusively to adults and older children.

The number of children using touch-screen tablets is increasing because of their stimulating multimodal features (e.g., sounds, animations, colour, and text) (Neumann, 2018; Roskos, Burnstein, Shang, & Gray, 2014), and because of their easy of mobility feature and their reasonable price compared to desktop and laptop computers (Shuler, 2009). Thus, it was not surprising to see that Jordanian children are aware of touch-screen tablets and their features in their home environments. Another reason could be due to the fact that children may find it easier to access and use tablets quickly and independently (Couse & Chen, 2010). Indeed, the range of tactile features (e.g., tapping, swiping, and sliding fingers over the screen) increased the use of tablets among young children because they allow for direct manipulation (Merchant, 2015; Tootell et al., 2013).

Despite children's awareness of tablets and their usage, children's tablet use takes place more at homes than in schools. The reason for that is that the Jordanian MOE does not have clear regulations related to the integration of this type of technology into schools. Thus, most Jordanian schools do not include tablets in their educational system. Although the MOE has already started launching some initiatives (e.g., Digital Schools Program) in order to provide schools in remote areas of the country with tablets and other technological devices (UNICEF-Jordan, 2015), this might take a long time to implement and does not cover all schools in the country. It is indisputable that the integration of technology into education is financially costly, and the MOE's budget may not cover this cost for the time being.

Furthermore, it was found that children used tablets for entertainment purposes with playing games being the preferred tablet activity followed by watching YouTube. Initially, parents may consider tablets as an entertainment tool that children need to play. It becomes common for Jordanian families to buy a tablet for their children from an early age. Once children have a tablet they start downloading as many games as they can. In addition, the YouTube icon is installed on most children's tablets in order to allow them to watch cartoons and other entertainment apps. This explains why some schools do not allow children to bring tablets to classrooms, as they were introduced as an entertainment tool rather than as a learning tool. This result is similar to other studies, which explored children's views of 'tablet usage (e.g., Dunn, Gray, Moffett, & Mitchell, 2016; Neumann, 2014; Petkovski, 2014) as these studies revealed that children spend most of their time playing on their tablets.

It was also found that touch-screen tablets were partly used for a range of educational purposes. This happened with some lessons that require children to memorize verses of the Holy Quran, practice 'tables of times' in math, or information gathering. Most of the research studies (e.g., Couse & Chen, 2010; McCarrick & Li, 2007; Penuel et al., 2009; Wiley, Cameron, Gulati, & Hogg, 2016; Wong, 2012) indicated that tablets have the potential to promote early learning when used for learning purposes. When children are encouraged to use tablets in doing homework, this reflects the fact that parents and/or teachers believe in the role of tablets as learning tools (Wood et al., 2016). Although tablets were used for learning purposes, this use was limited to home and took place with personal attempts. This result is supported by Michael Cohen Group and U.S. Department of Education (2011) who found that most apps used by children were gaming apps while educational apps were the least used.

Indeed, children viewed touch-screen tablet as an entertaining tool, spending pleasant time playing on it. This is expected as the tablets' multimodal features, as previously mentioned, encourage prolonged engagement and hold children's attention in multisensory ways by stimulating visual, auditory, and tactile senses (Roskos et al., 2014). Children may not recognize the role of the tablet as a learning tool since they hold positive attitudes towards this tool as an entertaining tool.

However, when the touch-screen tablets are implemented in the learning process, children may view them differently. Most of the children in this study were not taught in school using tablets, nor were they allowed to bring their tablets to school. This result is different from the work of [Bonds-Raacke and Raacke \(2008\)](#) who found that students perceive tablets as a more interactive, engaging, and effective educational tool to be used in the learning environment.

Studies conducted in different educational contexts revealed that there was a variety of purposes for using tablets, such as communicating through emails or chat and creating through making stories, videos, or audio recording ([Livingstone, Marsh, Plowman, Ottovordemgentschenfelde, & Fletcher-Watson, 2014](#)). However, these tablet activities have not been raised by the study sample.

Playing games on the tablets was the most popular apps children used at homes, and in most cases, it replaced outdoor play. Playing with friends and playing with their own toys were seen as a second choice when not allowing children to play on the tablet or limiting their tablet time. This could be a negative impact of the tablet, as it should not replace other traditional materials and non-screen activities used in early years settings. In the views of [Simon and Nemeth \(2012, p.16\)](#) *‘technology tools can and should be a part of your classroom toolkit right alongside with traditional learning materials’*.

In the Jordanian context, using tablets among young children were linked to ‘play’. That is, one of the main reasons for buying a tablet for a child is to play and have fun with it. This often happened in many situations particularly when parents were using tablets as rewards for children once they behave well, or when they achieve high marks at school. This result is supported by the work of [Dunn et al. \(2016\)](#) who found that gaming apps were the main type of activity that children carried out on the tablet devices. Similar results were also found in the work of other researchers (e.g., [Livingstone et al., 2014](#); [Neumann, 2014](#)) who revealed that the most common apps children used in their home environment were not related to educational apps but gaming and entertainment apps.

It was found also that children increasingly watch their favorite television programs through the YouTube website ([Livingstone et al., 2014](#)). This is because of the mobility of the tablets which allows children to use it in a flexible way anywhere and anytime ([Reychav & Wu, 2015](#)). In this technological era, children can decide what, where and when to watch programs through the YouTube channel. However, a low percentage of tablets' usage was reported regarding Google or Yahoo search for information, educational programs (software), and photo programs. This is because the tablet was introduced to children at the beginning as an entertaining tool instead of being a learning tool, although some of the games apps had learning potential ([Dunn et al., 2016](#)).

The results have demonstrated that most of the children master the main skills for using the touch-screen tablet, with high and moderate percentages. This is perhaps because children are witnessing a wide range of technologies in their home environment, and are immersing themselves at very early years into new digital tools ([Teichert & Anderson, 2014](#)). They might try to use their touched devices like their parents' smartphones or tablets. In fact, “children already had experience with their parents' mobile phones so moving to a tablet was only a matter of size, and an increase in size was appreciated” ([Bower, 2012, 44](#)). As children may gain increasing exposure and access to tablets at home they discover how to use them ([McManis & Gunnewig, 2012](#)). Another possible reason could be due to its touch-based multimodal interface which allows children to use tablets quickly and independently ([Couse & Chen, 2010](#)). In this context, the researchers (e.g., [Reychav & Wu, 2015](#); [Merchant, 2015](#); [Siegle, 2013](#)) stressed that the touch-based features of the tablet make it an easy to use tool for young children rather than typing and using mouse operated computers which require greater fine motor control.

Through using tablets, the children expressed that they need their parents' help and guidance to complete their tasks or download playing

games or movies from the Internet. Although tablets support independence in learning ([Couse & Chen, 2010](#); [Shuler et al., 2013](#)), these results indicated that children are not in control while using tablets. This result can be explained as parents may not want their children to have full control of their tablets. Parents sometimes may pause activities or do not give their children the Wi-Fi password so that their children can focus on homework and other school-based activities. Moreover, connecting tablets to the Internet needs parents' supervisions at all times. This may require parents to ensure that they have secure filters. Parents may have some concerns about their children's independent tablet use at home, particularly when tablets are connected to the Internet.

The results suggest that children mentioned that their parents impose rules regarding tablet usage. Such rules included assigning times for using tablets, prohibiting their children from logging into social networking tools and other movies or apps due to their inappropriateness to the child's age. This reflects the increasing awareness among parents of children, as parents may face or hear about bad experiences regarding children's tablet use and do not want children to be influenced by the negative effects of tablets. Those parents, therefore, hand over their tablets to children to play for a limited time. In the view of [Livingstone and Helsper \(2008\)](#), parents who allow their children to use the Internet are more likely to control what their children do on these devices. This explanation is supported by [Petkovski' \(2014\)](#) work which found that parents are concerned that their children use their tablets at home independently, as parents do not want their children to become addicted to tablet devices. Instead, they want them to reduce the time for non-screen activities. Interestingly, most of the children in the present study were aware of the apps that they are not allowed to use.

## 5. Conclusion and implications

The results of this study suggest that the children had reasonable knowledge about tablets and their features. They also master most of the skills needed to use tablets appropriately. Despite that, they viewed tablets as an entertainment tool and was mainly used at home than at schools. Moreover, playing games on tablets was the most popular apps used by children and has replaced traditional play-based activities. In addition, children believed that their parents' guidance while using the tablet was essential. Based on these results, several practical and theoretical recommendations are provided. From a practical standpoint, it is recommended that the MOE should expand the use of tablets in schools. This requires the MOE to conduct a review of the Jordanian educational system to identify opportunities for integrating tablets into education. Early years curriculum in Jordan should be revised to include activities that require children to use touch-screen tablets whether at schools or at homes. The curriculum should also include appropriate strategies and guidelines to support children's tablet use in schools. In addition, the MOE should provide schools with appropriate tablet apps.

As tablet education is a relatively new area in the Jordanian educational context, it is necessary to increase parents' and teachers' awareness of the positive impact of tablet technology on children's learning. This could be done by providing them with assistance, guidance, and training.

From a theoretical standpoint, the scope of future research should be expanded to explore tablet education in the Jordanian educational context, not only from children's opinions, but from those who are involved in this process (e.g., teachers, school principals, parents, university professors, and MOE officials). Gender differences in children's tablet use are an area in which further research is recommended. As the results revealed that children use different apps, therefore assessing the appropriateness of these apps requires further investigation. Experimental studies are needed to determine the effects of the use of tablet technology in the early childhood classroom on children's learning. Such studies can provide further evidence for the impact of

tablets within the Jordanian educational context. Finally, it would be useful to conduct comparative studies to investigate children's knowledge, skills, and attitudes towards tablet technology in Jordan when compared to different countries around the globe.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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