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The Role of Computer Technology in Supporting Children’s Learning in Jordanian Early Years Education

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ABSTRACT
The current research investigated early years teachers’ perspectives regarding the role of computer technology in supporting children’s learning in Jordanian kindergartens. Thirty semistructured interviews were conducted with preschool teachers. The sample of kindergartens in this study was purposefully selected from the targeted population of Jordanian public kindergartens in the central, northern, and southern regions. Selected kindergartens for this study were distributed among the three regions based on the proportion of kindergartens in each region compared to the total number of kindergartens across Jordan. Findings indicated that the preschool teachers did not have certain understandings of the benefits and advantages of young children’s computer use. Nevertheless, some of them highlighted some potential advantages of computer use for young children, such as acquisition of basic computer skills; the provision of a new means of self-expression; enhancement of learning, particularly in literacy and numeracy; and enrichment of school curricula. The study provides several practical and theoretical recommendations to improve the use of computer technology in the Jordanian kindergarten context to support children’s learning, particularly in the area of literacy and numeracy.

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Children’s learning; early years education; information and communication technology; literacy and numeracy; preschool teachers

We live in an increasingly technological age wherein almost every aspect of people’s lives is affected by technology (Kozma, 2005). However, the use of information and communication technologies (ICT) by young children has sparked controversy among early years educators as to the appropriateness of its inclusion in early years education. Literature reveals a drastic positive shift, particularly during the past decade, regarding the usefulness of integrating computer technology into preschool settings and its ability to enhance and promote children’s development and learning when appropriately and purposefully integrated. Yelland (2006) claims that, “New technologies . . . enhance and add to existing ways to explore ideas, create, research, and disseminate new knowledge acquired in the classroom. They provide opportunities to engage students and to draw on their diverse learning styles” (p. 172).

During the past several years, a number of countries around the world—such as the United Kingdom, the United States, New Zealand, Australia, and Singapore—have created policies for integrating ICT within the field of early childhood education (ECE) (Plowman, Stephen, & McPake, 2009; Selwyn, Potter, & Cranmer, 2010). These policies aim to identify the concept of ICT in ECE contexts and provide meaningful and purposeful guidelines to ensure that its use supports children’s learning and development.

Recent research conducted in ECE provides considerable evidence of the positive effects of ICT (Lee & O’Rourke, 2006; Morrow, 2009; Selwyn et al., 2010). For example, Siraj-Blatchford and Siraj-Blatchford (2006) identify four key categories for learning through ICT: communication and collaboration, creativity, sociodramatic play, and learning how to learn. These categories focus on
children’s interests and interaction while learning through painting software and computer games. Hayes and Whitebread (2006) consider the in-depth use of ICT to be the best contribution to children’s learning and add further learning categories to those of Siraj-Blatchford and Siraj-Blatchford (2006), namely, ICT and literacy, ICT and numeracy understanding, ICT and science, problem solving, creativity, and playful uses of ICT (painting, games, music, animation, simulation, and educational media).

The use of ICT for the enhancement of children’s literacy skills in early years is a common practice for many ECE practitioners. Voogt and McKenney’s study (2008) found that computers were useful in the development of literacy and communication skills of children between ages 4 and 5 years. Judge’s (2005) investigation of the impact of computer technology on the development of literacy for African American children showed that access to computers at home and in kindergarten significantly improved their academic achievement. The findings of this study also indicated that children from kindergartens who used literacy software more frequently had higher academic achievement levels at later stages of schooling.

Dhingra, Sharma, and Kour (2009) investigated parents’ perspectives regarding the impact of computer use on their children’s development in kindergarten, particularly in the area of literacy and numeracy. The majority of parents’ responses suggested that their children’s knowledge of colors, the alphabet, numbers, shapes, and exploration of concepts had increased as a result of using computers. However, some parents expressed their concerns regarding the impact of computer use on their children’s eyes. Furthermore, the study found that the frequency of computer use by children differed based on parents’ perceptions; fathers with positive perceptions of computer use allowed their children to use them more frequently. Accordingly, the researchers recommend addressing parents’ perspectives on the use of computers in their children’s learning.

Other literature is more favorable regarding the role of ICT in improving children’s learning skills, including reading, writing, and numeracy. Researchers argue that preschool children should access computers and the Internet in classrooms, provided that teachers impose control on said access. Internet browsing has increased rapidly among preschool children, who can benefit from various online resources. For instance, teachers can increase children’s enjoyment of reading and writing by providing them access to appropriate sites that enable them to explore electronic stories (Malhotra, Bana, & Malhotra, 2013). In the area of science, children can use the Internet (under teachers’ control and supervision) to learn about the environment, the earth, weather, plants, and animals.

Clements (2002) reviewed empirical studies highlighting the impact of computer use on children’s development in numeracy via various types of computer activities, including drill and practice and exploration of shapes, patterns, and numerical relationships via specialized and generic software that allowed children to carry out mathematical operations concerning objects displayed on the screen. This review concludes that evidence indicates computers can help young children develop numeracy skills, such as exploring shapes, relationships, sizes, spatial relationships, numerical relationships, geometric shapes, counting, classification, screening, addition, and subtraction.

However, a number of researchers oppose the introduction of technology into classrooms based on the argument that it is detrimental to young children’s educational development. For instance, Ramsey, Breen, Sturm, Lee, and Carr (2006) argue that adding computers to kindergarten classrooms will not necessarily promote a technological culture that supports children’s learning. Moreover, other researchers worry that children will use computers purely for entertainment and will opt for them in lieu of other, more appropriate, educational and physical activities (Kaindio & Wagithunu, 2014; Nikolopoulou & Gialamas, 2015; Stephen & Plowman, 2014).

In Ireland, Downey, Hayes, and O’Neill (2006) carried out a study to explore the impact of technology on children’s play activities. Data were collected via questionnaires, interviews, and focus groups with children, parents, and teachers. Most parents’ and teachers’ responses indicated an acknowledgment of the significance of children’s access to technology at an early age for the development of new knowledge and skills, and that these positive effects were more likely to occur when children used computers appropriately under parental or teachers’ supervision. However, some parents and teachers
felt that technology occupied most of their children’s leisure time, and that children sometimes became aggressive when they failed to successfully finish games. Additionally, there was some concern that technology could replace interaction with friends and physical activity, and that children might use computers exclusively for entertainment and not for learning. In this context, Dhingra et al. (2009) and Malik, Rahman, and Jumani (2011) suggest that parents develop their own computer skills to understand better how computers can support their children’s learning and development.

The global education agenda emphasizes the role of ICT in transforming and supporting the overall teaching and learning process (Aubrey & Dahl, 2008) and providing teachers and students with the expertise and skills to enable them to keep pace with a “knowledge society” in the “information age” (Ballock, Fitzgerald, & Kay, 2013). Many education systems are now consequently focusing on developing policies for ICT integration into curricula and teaching practices.

As the existing literature contains no previous qualitative studies of integration ICT into ECE in Jordan, this research will fill a significant gap. The present study seeks to explore the situation in Jordan by investigating teachers’ perspectives regarding the role of computer technology in supporting children’s learning in Jordanian kindergartens. This may help the Ministry of Education (MoE) officials in charge of ECE and other education policy makers in Jordan and other contexts to deepen their understanding of the role of computer technology for supporting children’s learning.

Statement of the problem

The effect of computer technology in ECE settings is well established, particularly with respect to enhancing children’s literacy and numeracy development, as mentioned earlier. Despite the advantages of ICT in facilitating teaching and learning process, computers are still not used effectively in most Jordanian kindergartens (Al-Natour & Ajlouni, 2009; Ihmeideh, 2009).

During his visits to some kindergartens, the researcher observed that day-to-day learning activities in most kindergartens lacked ICT beyond televisions and cassette recorders. Based on the researcher’s observation of several kindergarten classrooms and informal discussions with various teachers, he arrived at the following observations:

- The use of computers and other ICT technologies was minimal in kindergarten classrooms, and computer corners were absent from most of these classrooms.
- Several teachers were using traditional methods to teach children literacy and numeracy skills, such as worksheets, workbooks, and abstract experiments.
- Some teachers use computers only for games and leisure time activities, others did not recognize the benefits of computers in supporting children’s learning skills, such as literacy and numeracy, or are still lacking the training to use computers in developmentally appropriate literacy and numeracy practices.

It is unclear whether kindergarten teachers do not use computer technology in their daily practices because they do not believe that computers have a significant impact on children’s learning, or because they are not aware of the significant educational value of this tool. Therefore, it is critical to examine preschool teachers’ perspectives in Jordan about the role of computer technology in supporting children’s learning, and to find out whether their beliefs reflect their perceptions of their classroom practices. Thus, the current study examined the role of ICTs in children’s learning in Jordanian kindergartens.

Methods and procedures

Population and study sample

The targeted population of the present study comprises teachers of public kindergartens in central, northern, and southern Jordan. Public kindergartens were selected for the study because the public
sector plays a pivotal role in the provision of ECE in Jordan; the MoE has sole responsibility for administering and managing public kindergartens, whereas private kindergartens are managed by the private sector. Consequently, the researcher observed disparities between administrations, financial and educational systems, and curricula in the two sectors (MoE, 2014). For instance, the MoE’s initiatives and projects linked to integration and implementation of ICT in ECE, such as Kidsmart, Think First, and Sesame Tales, and the computerization of a standardized curriculum are only implemented in public kindergartens. Accordingly, the researcher decided that private kindergartens were not relevant to this research and excluded them from the population of the study.

Jordanian public kindergartens include KG2, because it is officially endorsed by the MoE as a compulsory class in future education, but do not contain KG1 classes. Thus, this study focused on KG2 classes and excluded KG1. Jordan is made up of three major regions: the central region, which is urban; the north, which is rural; and the south, which is mostly desert and is also known as the badiya.

**Sampling technique**

The sample of kindergarten teachers in this study was purposefully selected from the targeted population of public kindergarten teachers in Jordan. Consequently, interviews were conducted with teachers from 30 kindergartens across Jordan (middle, north, and south).

The sample of kindergartens in this study was selected based on four criteria: kindergartens must be from all three regions in Jordan, number of children in classrooms, funding, and implementation of ICT integration initiatives. The kindergarten teachers selected for this study were distributed among the three regions based on the percentage of kindergartens in each region compared to the total number of kindergartens across Jordan. These percentages are shown in the Table 1.

The teachers were all female. Kindergartens in Jordan are attached to girls’ schools, and the MoE believes that female teachers are more able than male teachers to teach young children and recognize their needs. The teachers were between ages 24 and 43 years and had between 2 and 16 years of work experience. The majority of teachers held a bachelor of arts (BA) degree or a diploma and only five had doctorate or master’s degrees. Their fields of specialty were child education, class teaching, elementary education, and school counseling.

**Data collection**

A semistructured interview technique was adopted as a key method of data collection, allowing the researcher to pursue interesting questions that emerged during interviews (Bryman, 2008; Dawson, 2007) and to provide more flexibility for the interviewer to ask extra questions and for the interviewee to offer more information (Kvale & Brinkmann, 2009). After the potential participants had agreed to take part in this study and provided signed consent forms, 30 semistructured interviews were conducted. Fifteen were with teachers from the middle region, 11 were with teachers from the north, and four were with teachers from the south. Before the interview began, I reiterated the teachers’ right to refuse to answer any given questions or even to withdraw from the interview and emphasized that all data would be kept confidential. I also made it clear to the teachers that they would not be identified at any stage of the research process.

<table>
<thead>
<tr>
<th>Table 1. Distribution and numbers of study sample according to region and the percentage of kindergartens (KGs) in each region.</th>
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<tbody>
<tr>
<td><strong>Region</strong></td>
</tr>
<tr>
<td>Middle</td>
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<tr>
<td>North</td>
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<tr>
<td>South</td>
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<tr>
<td>Total</td>
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All interviews were conducted during the period from September 2013 to January 2014. Each interview took approximately 40 to 90 minutes to ensure that all issues of concern were completely covered. To allow the researcher to transcribe interviews accurately, all interviews were audio-recorded. However, some field notes were written down to record interviewees’ responses to some questions that could not be effectively captured via sound recording. Although interview venues differed according to the facilities and conditions of each kindergarten, the researcher attempted to provide suitable venues as much as possible to ensure that interviewees felt comfortable and to exclude any external effects. Most interviews with teachers were conducted in staff rooms or in empty classrooms.

Data analysis

The process of data analysis is a key stage in qualitative research. In this study, the type of analysis adopted was thematic analysis, which consists of “identifying, analyzing and reporting patterns (themes) within data” (Braun & Clarke, 2006). The advantages of thematic analysis are flexibility and theoretical freedom; ease of accessibility; and the opportunity to understand participants’ responses (Braun & Clarke, 2006), systematically describe rich data, and carry out interpretations (Bryman, 2008). Braun and Clarke (2006) posit the existence of six phases of thematic analysis technique. Their application in this research is described in Table 2.

Table 2 Phases of thematic analysis (adapted from Braun & Clarke, 2006, p. 87).

<table>
<thead>
<tr>
<th>Phase</th>
<th>Brief description of the process</th>
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<tr>
<td>Becoming familiar with the data</td>
<td>All data obtained from research methods and field notes were read and reread. Meanwhile, the initial ideas were written down.</td>
</tr>
<tr>
<td>Generating initial codes</td>
<td>The key features and ideas across the whole data set were coded systematically. Data relevant to each code were collated.</td>
</tr>
<tr>
<td>Searching for themes</td>
<td>Codes were collated into potential themes and all data relevant to each potential theme were gathered.</td>
</tr>
<tr>
<td>Refining themes</td>
<td>In this phase, themes were checked regarding whether they worked in relation to the coded extracts (Level 1) and the entire data set (Level 2).</td>
</tr>
<tr>
<td>Defining and naming themes</td>
<td>The analysis continued until the specifics of each theme were refined and clear. Definitions and a name for each theme were produced and the overall story of the analysis was told.</td>
</tr>
<tr>
<td>Reporting findings</td>
<td>Using analysis relevant to the research questions and literature, three chapters were produced to tell the overall story.</td>
</tr>
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</table>

Findings

This section presents a key theme that emerged from teachers’ accounts of their perspectives on the integration of computer technology into early years education in Jordan, namely, supporting children’s learning. In relation to the study aim of exploring the role of computer technology in supporting children’s learning in Jordanian kindergartens, the key findings are presented below.

The majority of teachers believe that ICT, particularly the computer, provides a supportive learning environment characterized as being attractive, motivating, interactive, and positive. They also highlighted that software provides educational activities that rely heavily on multiple senses. Hence, they believe that it enriches the learning experience via provision of a range of materials, teaching instruments, and tools that make the lesson more attractive, effective, visual, and audio, compared to traditional classroom. Nonetheless, the majority of them were indecisive as to the advantages of computer use by children. They attributed that to the lack of survey and studies undertaken by the MoE to assess the use of software in Jordanian kindergartens.

Openly speaking, we, in the MoE, never had an opportunity to explore the advantages resulting from the children’s use of computer. I think we need scientific studies to examine advantages and benefits. However, we
expect the use of computers to provide enrichment to the learning experience via exposing children to a wide range of learning opportunities and teaching methods. (Teacher 1.3)

Likewise, some teachers (14 out of 30), particularly those from the south and north regions, indicated lack of information and genuine knowledge pertinent to the use of computers and software by children in kindergartens. They attributed that to several reasons related to obstacles that prevent the use of ICT in kindergartens. Generally, the majority of those teachers believe that the use of computers and the Internet could be a constructive means to create a motivating environment that contributes to the improvement of expertise and learning skills in early years of study.

I trust that the computer is functional in the promotion of learning, including the development of children’s knowledge and skills. Unfortunately, our kindergarten has never experienced technology; we still rely on traditional methods. Thus, I’m not sure about the advantages. (Teacher 3.4)

The aforesaid findings show that some of teachers do not have clear knowledge regarding the advantages of using computers, the Internet, and software to enhance children’s learning skills. They indicated the advantages in general, based on their own beliefs and humble experiences. According to the feedback provided by some teachers, they lack authentic experience related to the use of technology in their kindergartens and they face obstacles for integrating into some kindergartens.

On the other hand, 12 teachers from the north and middle regions indicated precise advantages associated with the use of computers, the Internet, and some software in their kindergartens, like realizing intellectual and mental fun for the child, developing positive trends toward learning via increasing readiness, motivation, enthusiasm, and desire to learn.

I realized that children were enthusiastic and willing to learn when using the computer and software. They were eagerly awaiting the computer lesson. I felt happy and motivated to learn and play via the device. I believe that my children favor learning via the computer over other means. (Teacher 1.2)

Moreover, some of those teachers specifically indicated the computer as an enrichment tool for the learning environment that provides genuine opportunities for children to share and effectively access the learning opportunities, particularly through effects and audio-visual traits and prompt effective feedback as to success in achieving tasks.

The availability of computer effects such as colors, motion, music, rhythm, light, image, and, most importantly, provision of feedback on the task performed by them, considering the individual differences which encouraged children to engage in the activity, and this facilitated the learning of the new experience, storing it and retrieve it easily. (Teacher 2.3)

It could be concluded from the aforementioned excerpts that children experienced an authentic experience and relied on multiple senses when using the computer. Also, the experience was provided in a fun, interesting, and meaningful way via colored cartoon characters speaking a language similar to that of children and immediate feedback was offered, which encouraged children to engage in the learning situation and thus realize a better and more prompt learning experience. Further, it can be concluded that it added emphasis to focus and attention, while breaking inertia and boredom. This implies that the characteristics of computer use contributed to the provision of better learning opportunities for children and increased readiness and desire for learning.

Moreover, other teachers added that the use of drawing, graphics, animation, icons, texts, and audio-visual effects all provided a value for interaction between children and education materials, which sustained speed of understanding and retrieval of knowledge as well. More important, such characteristics and attributes open the horizon for support of learning numerous skills, such as literacy and numeracy, “The availability of expertise in voice, image, motion, rhythm, and colors facilitate the ability of children to receive and store them and to easily retrieve them, which assisted the improvement of their learning” (Teacher 1.7).

With regard to the teachers’ perspectives concerning the improvement of reading and writing skills, the interviews revealed that 10 teachers agreed that the use of computer software, such as
children’s songs, computer games, language games, and print-rich software, helped children to learn reading and writing skills. Conversely, 11 teachers indicated that their children’s reading and writing skills improved via writing their names, phonemic awareness, learning the alphabet, and writing some familiar vocabulary items via using word processor.

I feel that the reading and writing skills for children have improved through the use of CDs containing a variety of kids’ music, where the child repeats the spoken words and sections. This software includes motions, sounds, music, shapes, colors, and drawings, which make them interesting and exciting, [which] increases the child’s readiness for reading and memorizing. (Teacher 1.5)

In the same context, nine teachers indicated that computer software contributed to the development of literacy skills through conversation, listening, fiction, reading, writing, images, shapes, recording children’s voices, and describing a picture of a scene on the computer.

I often use the reading and writing programs to improve children’s skills via reading of alphabet, some vocabulary items, and numbers. For example, the child clicks a certain number using the mouse, then the cartoon character says the number and asks the child to repeat it, and so on [for other] words, numbers, shapes, or drawings. (Teacher 1.2)

Other responses underscored that computer software provided some strategies that enhance and promote reading and writing, such as links between an image, voice, text, spoken and written word, and visual text. For instance, the visual image could form a central point for discussion among children. Hence, these methods provide opportunities to help children improve their ideas and enhance comprehension, memorization, and knowledge retrieval.

When teaching a new alphabet or word, we often utilize some activities [that] develop the alphabet or word into a concept. Among these activities, for example, is linking the word with a picture, voice, and text. . . . These are aids that indicate the meaning of the word. (Teacher 2.4)

On the other hand, the interviews conducted with some teachers obviously indicated that the use of some computer software, such as kindergarten curriculum software and Kidsmart, helps to develop and improve numeracy skills through the provision of countless applications and activities:

Software of kindergarten curriculum, and Kidsmart, comprise a variety of games that focus on the improvement of arithmetic skills, such as counting, matching, sorting, and sequence. For example, when teaching the number 4, the child is asked to link or match between the number 4 and four objects. Hence, through repetition and practice, the child understands the number 4 and its symbol. (Teacher 1.8)

Increasingly, those teachers indicated that computer software provides a variety of methods to improve mathematical skills and concepts, such as exploration of shapes, correlations, sizes, special correlations, numerical correlations, signals, comparisons, addition, subtraction, sorting, and matching. All these represent exciting and attractive visual patterns that are simple for a child to learn:

Teaching children arithmetic skills often relied on Kidsmart software that comprises several sports games characterized by fun. Children were able to learn numbers, addition, subtraction, sorting, screening, geometrical shapes, measurement and sorting skills. I believe that some of these games improve and develop some skills, such as exploration, problem solving, and shared thinking. (Teacher 2.1)

These responses provide evidence in support of the fact that using Kidsmart software and software of kindergarten curricula provide a variety of activities that improve and develop arithmetic concepts, such as counting, sorting, screening, addition, subtraction, geometrical shapes, sizes, comparisons, etc. Furthermore, it can be concluded that these activities develop thinking skills, such as exploration, problem solving, and shared thinking, that children need to understand the surrounding world.

Also, others indicated that computer software, such as kindergarten curricula software and others, provide a variety of activities that develop and improve vocabulary, particularly English language.
They added that they improve and develop other skills, such as cooperation and interactive learning among children and teachers and collaborative team work as well.

Generally speaking, the perspectives of those teachers about the use of computers and the internet for children were influenced by their own experiences using Kidsmart software and kindergarten curricula software. They believe there are several advantages for children using computer software, such as developing literacy and numeracy skills, problem solving, shared thinking, decision making, opportunity for self-exploration, buildings of expertise, enhancement of children’s abilities to learn and play, development of cooperation, and dialogue regarding a problem area.

**Discussion**

The majority of teachers in this study expressed positive expectations for the educational value of ICT in early years environments, particularly with regard to its ability to enrich learning environments and enhance children’s learning and development. These perspectives seem to be highly consistent with studies conducted by Siraj-Blatchford and Siraj-Blatchford (2006), Plowman et al. (2009), and Selwyn et al. (2010), which outline the basis for the educational value of ICT in kindergarten contexts. First, ICT has a genuine effect on people and the learning environments that surround them. Second, technology provides opportunities to experience learning material that enhances various practices in ECE. Third, all education sectors are highly concerned with the development of education policy, school curricula, and classroom practices. Siraj-Blatchford and Siraj-Blatchford (2006) argue that computers should be integrated into ECE since they perform a function that could not be better performed via other means; in fact, most studies in this area came to similar conclusions regarding the integration of ICT into kindergarten environments.

Furthermore, the findings that emerged from analyses of teachers’ interviews revealed a generally positive consensus that ICT integration in kindergartens, particularly computer-based ICT, was advantageous for children. The majority of responses asserted that ICT integration in kindergartens could allow children to master basic computer skills, find new methods of self-expression, and gain enhanced learning skills. Most interviewees felt that acquisition of basic computer skills would give children greater access to knowledge, skills, and learning experiences that could positively affect their learning in the long term; encourage children to conduct further exploration into learning topics; and increase attention span, ability to focus, self-confidence, drive to learn, and hand-eye coordination. These perspectives echo those noted in studies conducted by Hayes and Whitebread (2006), Voogt and McKenney (2008), and Dhillon et al. (2009), which highlight the importance of children developing “technological literacy” (Siraj-Blatchford & Siraj-Blatchford, 2006) as early as possible, as literacy in this area is a crucial factor in the enhancement and sustainability of children’s learning.

The findings of this study also show that some teachers are confident in the use of computers to enhance children’s literacy, numeracy, and scientific reasoning skills. With regard to literacy, these stakeholders feel that computers could aid children in gaining sound awareness, learning to spell words and familiar phrases, and writing their names. With regard to numeracy, stakeholders suggested that computers could assist children in learning numeracy skills and concepts, such as counting, classification, comparison, addition and subtraction, and distinguishing between shapes, colors, and sizes. These views are consistent with the findings of Dhillon et al. (2009), who found that the majority of teachers interviewed saw computers as able to enhance children’s development and learning irrespective of the obstructions they faced inside their classrooms. Analogous findings were found in several other studies, which also indicated that some teachers had positive attitudes toward the computer’s role in the enhancement of children’s literacy and numeracy skills (Malik et al., 2011; Stephen & Plowman, 2014; Voogt & McKenney, 2008; Yelland, 2006).

Many other studies, such as those of Lee and O’Rourke (2006), Selwyn et al. (2010), Kaindio and Wagithunu (2014), Nikolopoulou and Gialamas (2015), underscore the ample advantages and benefits resulting from the integration of computers and other ICT items into school curricula. Similar findings emerged from this study. Some teachers and head teachers stated that the
integration of ICT into kindergarten settings could add educational value to school curricula by clarifying lesson content, providing more activities and applications for children, preventing boredom and stagnancy, embodying concepts and natural phenomena, and presenting information through a wide range of media. As Clements (2002) states, however, active engagement on the part of teachers is key to the success of computer integration in curricula, “There is equally strong evidence that the curriculum in which computer programs are embedded, and the teacher who chooses, uses, and infuses these programs, are essential elements in realizing the full potential of technology” (p. 174).

Despite these positive attitudes, the findings of this study also indicate that a few teachers believed that computer use in ECE could be detrimental to the health and development of young children and could lead to poor social relationships, isolation, impaired vision, inability to focus, poor attention spans, and imitation of aggressive behaviors. Therefore, they suggested that children at this stage should learn via outdoor play and the use of tangible objects, such as clay, sand, water, and paste. These perspectives corresponded with the findings of many early studies, which concluded that computers were developmentally inappropriate for young children in ECE, provided no educational benefits, and distracted children from real-world experiences (Elkind, 1996; Healy, 1999; Ramsey et al., 2006). In the current study, teachers’ negative beliefs regarding the use of computers by children can be ascribed to a lack of firsthand knowledge in this area—for example, some teachers believed that young children were unable to use computers—and to influences from the sociocultural conditions of their work and living environments.

The findings outlined above are of note because they highlight teachers’ views on the value and benefits of ICT integration in the teaching and learning process in kindergarten. According to teachers, computers’ unique audio-visual effects and other attributes assist in creating attractive, motivating, interactive, and positive learning environments. Such environments, rich with tools and activities, may help to create mental and intellectual stimulation for children by providing a useful framework for the promotion of learning skills, such as literacy and numeracy. More important, computer-based activities and applications can improve and develop higher-order thinking skills through encouraging purposeful game playing; this, in turn, can facilitate interaction and cooperation among children, exploration, experimentation, discussion, creativity, problem solving, and flexible thinking. Teachers’ perspectives echo those of the ecological techno-subsystem, which indicates that the spread of diverse technological tools, such as computers, the Internet, mobile phones, electronic books, and software, at the microlevel enables children to access information and enhances their cognitive, social, emotional, and physical development (Johnson & Puplampu, 2008).

**Conclusion**

Based on the above discussion, it can be concluded that the findings of this study provided evidence that integrating ICT into ECE could promote children’s learning and development, and that some children’s reading, writing, and numeracy skills benefited from computer-based work. In addition, various computer tasks and applications increased children’s opportunities for exploration, experimentation, problem solving, joint reflection, collaborative work, creativity, and self-expression. Moreover, the findings displayed strong agreement among the majority of teachers regarding the use of ICT, particularly computers, in ECE, in conjunction with other educational tools to enhance children’s learning experiences. However, teachers also expressed general concern about a lack of knowledge and understanding regarding policies for ICT integration into ECE and national ICT projects and initiatives, such as Kidsmart. This lack of knowledge led some teachers to rely on their own expertise when using computers in their classrooms, which, in turn, sometimes caused them to use computers inappropriately.

Based on these conclusions, several recommendations are provided. From a practical standpoint, it is recommended that the preschool teachers must gain awareness of the educational and developmental benefits of ICT for young children through training courses, workshops, or exchanging
expertise with other practitioners. Such awareness should be an integral part of ICT policy and of teachers’ professional development. Adequate professional development and training related to the use of ICT with young children must be provided to teachers. Teacher training should focus on teaching basic ICT skills before moving on to pedagogical training. Jordanian universities could assume this preservice training function by designing practical training programs that focus on improving teachers’ basic computer skills and introducing them to ways of using computers in teaching. Teachers and practitioners must be provided with guidelines enabling them to select developmentally appropriate software that enhances children’s learning and to avoid software that adversely affects children’s development. Teachers also must be aware of the safety and security issues involved in young children’s computer use.

References


