EDUCATIONAL SCIENCES: THEORY & PRACTICE eISSN: 2148-7561, ISSN: 2630-5984

Received: 02 January 2025
Revision received: 14 February 2025
Accepted: 20 February 2025

www.jestp.com

DOI 10.12738/jestp.2025.1.05 ♦ **January** 2025 ♦ 25(1) ♦ 59-69

Article

Children's Play-Based Learning with ICT Tools: Early Childhood Teachers' Perspectives

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Abstract

In modern times, children adopt play-based learning approach with the help of early childhood teachers' knowledge and understanding of ICT, to learn how to use ICT tools and apps for playing and learning. The main purpose of this study was to identify perspectives of Saudi early childhood teachers toward the use of ICT tools; what difficulties they face when they try to use and integrate ICT into children's play and learning, and how to help children overcome these difficulties. The study involved a qualitative open-ended survey design, to collect data about teachers' knowledge of ICT, types of ICT tools used in their classrooms, how to introduce ICT into children's playing; issues they face and how to overcome these issues. The sample comprised thirteen teachers, whose responses were analyzed through thematic analysis to generate themes and codes. The results revealed five different themes: (a) knowledge and attitude toward ICT, (b) ICT environment ideal for playing and learning, (c) ICT integration in children's play-based learning, (d) beliefs about ICT in children's education, and (e) obstacles to integrating ICT into children's play-based learning. The overall results from the study were that early childhood teachers highly valued ICT integration into children's play and learning; however, their knowledge and practices remained simple and traditional. The teachers showed an interest to develop themselves, their knowledge, and their practices to provide more productive and positive learning experiences for the children. To address gaps between teachers' knowledge and practices, and their high value of ICT, future research should examine the reasons of this differentiation of valuing and but not practicing. This study contributes to the field of early childhood education by showing how early childhood teachers perceive and practice ICT in children's education, and how their knowledge and understanding shape their practices. Furthermore, the study findings could assist policymakers in knowing how to develop and enhance teachers' practices.

Keywords

Information and Communication Technology, ICT Tools, Play-Based Learning, Digital Devices, Applications, Teachers, Children.

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Citation: Alharbi, M. O. (2025). Children's Play-Based Learning with ICT Tools: Early Childhood Teachers' Perspectives. *Educational Sciences: Theory and Practice, 25*(1), 59 - 69.
http://dx.doi.org/10.12738/jestp.2025.1.05

Introduction

Children grow through playing and learning; however, over the years, the nature of playing has changed and developed (Bali et al., 2021). In early days, children played and learned through hands-on activities with toys and other materials from real life. Nowadays, their toys and other learning material have transformed into digital devices. Digital technologies play a sizable role in our lives. Digital technologies are becoming a significant part of childhood play and learning experiences (Eliasson, Peterson, & Lantz-Andersson, 2023; Figueiredo, Santos, & Rego, 2021; Morgan & Kennewell, 2005). As the world developed rapidly, so did children's play and learning. Today, children enjoy playing and interacting with digital devices (Lähdesmäki, Maunumäki, & Nurmi, 2024; Suhirman, Ramdani, & Ramdhani, 2020). Children show interest and curiosity when playing with digital devices and media. Children at this age are curious and like to use digital devices at home and in school. Taking advantage of digital devices to enhance children's play and learning would benefit children's education in different facets (Rahayu et al., 2019).

The integration of Information and communication technology (ICT) in education is being highly recommended as a mid-way learning activity between traditional learning and learning with media, games, and other technological tools, although games are still often viewed as non-serious activities in formal education (Pivec, 2007). ICT can be integrated in educational settings in all age groups (Zaranis, 2016); however, during early childhood and primary levels, ICT integration stimulates children's interest in learning. ICT can particularly assist in achieving the learning objectives of the early childhood curricula if supported by proper educational scenarios that are embedded in proper software applications and employed by qualified and skilled teachers (Zaranis, 2016).

One reason to implement ICT in classrooms is to give young children the 21st-century skills needed for the future. Early childhood teachers need to make a positive use of ICT in their classrooms to promote children's learning and other developmental skills that are needed for this generation to grow and learn for their future (Lamrani & Abdelwahed, 2020; Peirce, 2013). Indeed, teachers are progressively requested to incorporate ICT into modern classrooms (Willis et al., 2019). Furthermore, teachers would have a different delivery mode that could be used in classrooms easily. Teachers could make a positive use of ICT to support and enhance children's play and learning (Alazwari, 2021; Kaimara et al., 2021). However, teachers need to be educated and creative when using technology, games, applications, and media to promote children's play and learning.

Moreover, technological integration in education has also been strongly encouraged to be used and applied starting from early childhood. Teachers are willing to integrate technology within educational learning to foster children's learning and development, and to make a positive use of technology with play and learning purposes (Eliasson et al., 2023; Pappa, Georgiou, & Pittich, 2024). Nonetheless, current early childhood teachers in the field have indicated the need to develop and enhance their understanding of technology and ICT in ways that promote children's learning and playing in an enjoyable, fun-seeking, interesting, and interactive way (Sundqvist, 2022). Although a growing body of research has provided evidence of and support for the positive impact of technologies in children's education in facilitating learning across school subjects (Zaranis, 2016), there is still an urgent need to enhance teachers' technological use and understanding it for educational purposes (Ihmeideh & Al-Maadadi, 2018; Liu & Pange, 2015; Ogegbo & Aina, 2020; Pappa et al., 2024). ICT integrated into children's play-based learning (PBL) can benefit children's learning and development.

Saudi Ministry of Education has also been working continuously for years on developing its education policies and strategies for all levels starting from early childhood to university levels (Ministry of Education, 2025). This study investigates how Saudi early childhood teachers develop their perspectives on the integration of ICT in children's PBL as a part of their daily practice, including their knowledge and understanding of ICT; how they integrate technology into their daily practice; what types of technological tools and apps are most used in their classrooms; what obstacles they might face; and how to overcome those obstacles. In order to achieve these objectives, this study was guided by two research questions: (1) How do early childhood teachers perceive ICT in children's education? (2) To what extent do early childhood teachers integrate ICT into children's PBL?

It is hoped that this study would help to register children's PBL as a new learning delivery mode to enhance and stimulate children's learning and development. It would contribute to a deeper understanding of teachers' problems with the use of ICT in children's play and learning, and exposing the reasons of their practices in order to create a future developmental plan which can positively affect teachers, children, and the domain of education itself, and develop the teaching and learning process as well. This study would show how to keep pace

with the rapidly developing educational systems in general, and Saudi education system specifically. Since technology is taking a huge part in our lives, it is necessary to make a positive use of education to benefit our children's learning and playing.

Literature Review

Children's PBL with ICT Tools

Children's first and best learning method is playing (Ndlovu et al., 2023; Nisiforou & Zaphiris, 2020). They learn best when an interactive and social environment is available in their classrooms. Additionally, they benefit from an environment tailored to their special needs and interests. Presenting different forms of play and different styles of learning would benefit children's learning academically and developmentally. For decades, PBL has been known as the best approach to learning for children. Nowadays, new learning approaches are being developed, and various learning methods are being presented in the field. Modern societies have transformed their view of the learning process and delivery mode (Mishra & Joseph, 2012). Aruleba and Jere (2022) investigated the urgent need to explore the state of digital technologies in children's education in rural areas. The researchers identified three challenges in their study findings reported by teachers, viz., socio-economic, technological, and political. Moreover, Yang and Dong (2024) examined teachers use of ICT in early childhood settings. The authors found a significant influence of how teachers use ICT on children's learning. They emphasized on the need for deeper insight into the factors shaping teachers' technological practices.

ICT is being highly integrated and recommended for educational purposes (Toki & Pange, 2022). It can both offer enjoyable learning experiences and satisfy children's interests in technology. It can also work as a learning support in children's education (Lamrani & Abdelwahed, 2020; Miguez, Santos, & Anido, 2009). ICT devices and methods can include mobile applications, clicker devices, a flipped classroom, computers, video games, media, social networking, media applications, the internet, laptops, tablets, software tools, online learning, and interactive whiteboards (Kaur, 2023; Toki & Pange, 2022).

In his sociocultural theory, Vygotsky (1978) highlighted children's zone of proximal development, where teachers facilitate children's learning and then withdraw slowly so that children can complete tasks independently. According to this theory, teachers play a key role in providing and implementing the necessary learning tools such as ICT for children's learning experiences. Teachers can provide and use a variety of ICT devices in their classrooms for the children to learn, interact, communicate, and build on their previous knowledge. Teachers' knowledge and involvement in children's learning within ICT is highly important to assist children in using the tools correctly and moving to the next level in productivity (Eliasson et al., 2023; Toki & Pange, 2022). Additionally, ICT can be easily integrated into children's PBL experiences when teachers have adequate knowledge and participation in the learning environment. Teachers need to know how, when, and which ICT device is appropriate to integrate into a specific learning experience.

Nonetheless, it is important to note that some countries in Europe, America, Africa, and the Middle East still struggle with ICT integration in education (Ogegbo & Aina, 2020; Preradović, Lešin, & Boras, 2017). Eliasson et al. (2023) have investigated in their study how early childhood teachers implement technological activities in preschool settings. The researchers found that it is critical to educate teachers about technology education in their professions due to the influence of it on their perspectives.

The success of ICT implementation in classrooms depends on teachers (Hesterman, 2011; Ihmeideh & Al-Maadadi, 2018; Olowe & Kutelu, 2014). Hence, teachers need training and developmental programs on ICT devices and applications and how to use them to support teaching and learning. Ihmeideh and Al-Maadadi (2018) highlight different guidance for teachers on using ICT with children, such as deciding which ICT tools are the best fit for specific activities and learning contents, identifying which tools are more appropriate for each child individually, determining which tools can be used in their classroom context, explaining how to use the ICT tools or software to the children, assisting children with moving to higher levels of difficulty, offering assistance, and celebrating accomplishments with children.

Integrating ICT in Children's Skills Development

ICT integration in children's education has long been debated by researchers and academics in the field. While a few have supported the integration of ICT for the benefit of children's learning and developmental skills

(Komen & Ongínjo, 2024; Willis et al., 2019); others have discouraged this integration due to concerns of health issues, harmful digital content, and children being isolated from social interaction (Liu & Pange, 2015; Zaranis, 2016). Prior literature recommends no screen time for children under age 2 and no more than 2 hours for older children.

Weber and Greiff (2023) investigate ICT essential skills needed for 21st century education and children. These ICT skills support the development of children's technological proficiency including information literacy, computational thinking, problem-solving, critical thinking, scientific reasoning, collaboration, and creativity. Other studies (Kaur, 2023; Mishra & Joseph, 2012; Nayak & Kalyankar, 2010; Ogegbo & Aina, 2020; Olowe & Kutelu, 2014; Peirce, 2013; Ukwueze & Ajala, 2014; Willis et al., 2019), have shared several advantages of ICT for children's learning and development, including"

- Supporting children's social, emotional, and cognitive development.
- Supporting children's language, literacy, and vocabulary development.
- Developing children's fine motor skills and small muscle movements.
- Developing children's cooperative and collaboration skills, as well as relationships and self-regulation.
- Meeting and satisfying children's interests and special needs.
- Strengthening relationships between children and adults; providing a way for adults to identify children's interests and thinking.
- Scaffolding children's learning and facilitating new learning.
- Enhancing children's learning and play experiences.
- Providing a way for children to practice and support their computational thinking and problem-solving.
- Supporting children's creativity and divergent thinking.

Methodology

Research Design

A qualitative research design was utilized in this study (Bogdan & Biklen, 1997), a type of research which was not used until the late 1960s. The qualitative research techniques help collect data rich in descriptions of people, conversations, and places; and which cannot be easily handled or presented by statistical procedures (Bogdan & Biklen, 1997). Jansen (2010) indicated that qualitative surveys help investigate topics in depth; and establish and determine the diversity of people who might share the same characteristics or have different characteristics to create meaningful variation within that population.

Sampling

The sample comprised thirteen teachers from early childhood schools, public and private, selected randomly through purposive sampling techniques. A small number of participants was determined to avoid saturation. The study was conducted in Riyadh, Saudi Arabia; however, to bring more and different perspectives and experiences, schools were chosen from different geographical areas: west, south, north, and east Riyadh. The Committee of Research Ethics and Institutional review board at the author's university had approved the study and the data collection tool. Each participant provided informed consent prior to the data collection, which highlighted the teachers' rights as participants in this research and stated that their participation was voluntary and they could withdraw from the study at any time with no consequences.

Data Collection

An open-ended survey was conducted to explore early childhood teachers' perspectives of ICT integration into children's PBL. The survey was delivered to the participants via a Google Forms link. Being qualitative in form and content, this survey used open-ended questions to obtain long and written answers. Each question aimed to reveal opinions, experiences, and narrative answers. The survey also included descriptive questions that elicit in-depth answers. "Open research questions are typically used in qualitative research. They allow participants to provide in-depth and personal responses that provide insight into their lived experiences – their thoughts, beliefs, views, opinions, and experiences" (Holmes, 2023, p. 2). All participants were explained the objectives of the study and their rights to withdraw at any stage.

Data Analysis

A six-stage qualitative thematic analysis was conducted to investigate early childhood teachers' perspectives on the integration of ICT in children's PBL. These six stages included: familiarizing with the data, generating codes, searching for themes, reviewing themes, defining and naming themes, and producing a report (Braun & Clarke, 2006).

Results and Discussion

The study focused on early childhood teachers from public and private schools in the capital of Saudi Arabia. The teachers' demographic profile shows that all of them were females and shared similar perspectives toward ICT in children's education. (see Table 1).

Table 1*: Participants' Demographic Information.*

Teacher	Age	Qualification	Teaching Experience	School
Manal-A	50	Bachelor's in ECE	13 years	Public - West
Aljawharah	51	Bachelor's in ECE	14 years	Public - East
Ibtisam	33	Master's in ECE	5 years	Private - East
Hadeel	38	Bachelor's in ECE	8 years	Public - South
Nawal	55	Bachelor's in ECE	32 years	Public - West
Ghadah	49	Bachelor's in ECE	12 years	Private - West
Maha	45	Bachelor's in ECE	7 years	Public - South
Manal-B	56	Bachelor's in ECE	13 years	Public - East
Nourah	37	Bachelor's in ECE	7 years	Private - South
Mashael	55	Bachelor's in ECE	28 years	Private - North
Areej	39	Master's in ECE	10 years	Public - North
May	33	Master's in ECE	10 years	Private - East
Haifa	40	Bachelor's in ECE	15 years	Public - North

The findings of this study are divided into five categories thematically: (a) knowledge of and attitude toward ICT, (b) ICT play and learning environment, (c) ICT integration in children's PBL, (d) beliefs about ICT in children's education, and (e) obstacles to integrating ICT into children's PBL.

Knowledge of and Attitude Toward ICT

It is evident from this study that early childhood teachers possess decent knowledge about what ICT is and how to use it; though they lack proficiency in ICT, but they understand policies and obligations. Teachers who work with children know that digital devices accelerate children's learning interests and make learning experiences more fun, sparking children's curiosity. However, all participants agreed that there is a need to integrate ICT into their teaching practices as a modern learning method to meet children's need for 21st-century skills. Many teachers indicated that ICT apps and devices work as assistance tools for teaching. Additionally, their knowledge of ICT was limited to their classroom practices. For instance, Teacher Manal-A said, "I know a little about ICT; however, I try to benefit from what I have in my classroom from the screen to use YouTube videos related to the lesson." Techer Ibtisam indicated, "I use digital devices to deliver information, such as tablets and smartboard." Teacher Manal-B said, "ICT are ways to assist children to seek information, search, and investigate." From teachers' answers, it is clear that their knowledge of and attitude toward ICT were limited to their classroom practices, as well as the availability of devices and apps. This finding is consistent with previous results of studies relevant to this aspect of ICT integration (Alazwari, 2021; Pappa et al., 2024; Sehnalova, 2014). The devices and apps most frequently mentioned by the teachers regarding use in their classrooms were smartboards, You Tube videos, and tablets. Teachers May and Haifa said that they use YouTube videos often when introducing a lesson. Teacher Nourah stated, "I use PowerPoint slides and tablets in my classroom." Teacher Hadeel said, "I use YouTube and different apps to communicate with parents too." Furthermore, all of the teachers illustrated that their proficiency in using ICT and integrating it with teaching methods was limited, but they seek to learn and develop. Teachers Aljawharah, Nawal, May, and Mashael clearly stated that they do

not consider themselves professional in integrating ICT into teaching, and their knowledge and practice of ICT are limited. Teacher Ghadah said, "My knowledge and skills are simple based on my classroom practices." Previous studies have observed similar results concerning the integration of ICT into their teaching practices and allowing students to learn 21st-century skills through modern learning methods (Hussain et al., 2023; Willis et al., 2019).

All the teachers were asked a critical question about the policies and obligations of using ICT in their classrooms and whether they were aware of the polices of integration of any type of ICT and digital devices and applications in their classrooms. All of the teachers shared similar responses. For instance, Teacher Areej declared, "No, I do not know if there is any rules; however, I know that I must examine any video or app before introducing them to my children, and they must be age appropriate." On the other hand, Teacher Maha confirmed, "Yes, I know that I have to check on the content first, respect children privacy, and technology in general are used to support learning."

Despite teachers' limited knowledge of and skills regarding ICT in children's education, the teachers stated that children's safety comes first. The teachers carefully examine any app or video they introduce in their classrooms. The teachers also expressed a desire to learn more and develop themselves in this area. The teachers considered ICT to be a different and interesting method by which to support their traditional teaching. The teachers clearly try to integrate ICT into their traditional teaching to capture children's attention and to introduce new and modern methods into their teaching process.

ICT Play and Learning Environment

The school and classroom environment is a major factor in integrating and implementing ICT into children's daily play and learning activities. The type of equipment available in their classrooms affects teachers' implementations (Hesterman, 2011; Kaur, 2023). Teachers' classroom management while integrating digital devices and applications into teaching or playing is considered another major element that influences the way teachers apply these methods and the time spent using them in their daily activities. Analysis of the data revealed that the technological tools used most frequently in participants' classrooms screens, smartboards, computers, and tablets. Teacher Haifa clearly illustrated the types of technology they use in their classrooms: "We have smartboard and tablet that we use to play and learn." Teacher Ghadah indicated, "We have screen and computer as a technology tool." Most of the teachers shared similar responses in this regard.

Participants also shared similar responses about the technological tools they wished they could have in their classrooms to make play and learning more effective and fun. Teacher Manal-A said, "In my classroom, I wish we have computer and smartboard." Teacher Ibtisam replied, "We need to have smart-table." Teacher Nourah expressed, "We need smart-table, so children can use during play-time, smartboard better that the screen for learning-time." These were the three technological tools the teachers viewed most as necessary for their classrooms: smartboard, smart-table, and computer.

Analyzing and reviewing the data indicated that most of the teachers shared similar answers and experiences. However, none of the teachers commented on hands-on ICT games and activities. These digital games provide a great opportunity for children to play and learn collaboratively. It also increases children's vocabulary and literacy, social-emotional skills, critical thinking, teamwork, communication, and more. Classroom management was also considered critical by all teachers in their daily routine. Some teachers admitted facing difficulties integrating ICT into children's play and learning due to managing children and avoiding chaos. Nonetheless, the data revealed that teachers do not face critical issues in managing their classrooms. The teachers integrate technology during academic learning, where they have more control, and during play time, they also try to use devices they have to support early academic learning in a play form and with a limited number of children. Such a selective approach and working under constraints were also revealed in previous studies (Nikolopoulou, 2015; Peirce, 2013; Rahayu et al., 2019; Sundqvist, 2022).

Teacher Manal-A clarified, "Before any time, I remember the children of the classroom rules, and I chose children by turn, so I do not face issues." Similarly, teacher Maha said, "We say the classroom rules first, then we move around the children during playtime to insure everything is fine." Additionally, teacher Manal-B stated, "We mention the rules, I move around the classroom while children playing or learning, and I make sure the apps are age appropriate and good for children." Teachers' responses showed that classroom management was not an issue for them due to their simple integration of ICT into children's play and learning.

ICT Integration in Children's PBL

Playing and learning have many definitions; however, these definitions share similar characteristic, such as symbolic, voluntary, pleasurable, active, and fun. Teachers can easily take advantage of children's playing and learning to integrate ICT into their curriculum to support active learning and promote a higher level of complexity in play. Furthermore, teachers could benefit from ICT as a modern and different method of teaching that grabs children's attention. Nowadays, children enjoy using digital technologies and interact with them easily like professionals. Teachers have found that using ICT in teaching and play supports their teaching techniques and gives them a different method to use. This approach was also observed in previous studies which found that teachers can benefit from the use of ICT to connect academic learning with playtime and to continue learning in a fun and active way (Peirce, 2013; Sundqvist, 2022; Willis et al., 2019).

When the participants were asked about their integration of ICT into children's play and learning, they all indicated that they do integrate ICT into children's play and learning times. For instance, teacher Ibtisam declared, "In playtime, I use interactive activities with my children, like digital games that make me interact and talk with the children while they are playing. While in learning time, I mostly use PowerPoint and videos. I make conversations with the children about them and sing with them." Relatedly, teacher Hadeel stated, "During playtime, I allow my children to use the classroom tables to play what they want under my supervision. While during learning time, I display stories and interactive songs." From participants' responses, it was clear that the integration of ICT into their classrooms was based on the availability of digital devices they have. Additionally, their ICT implementations were similar to each other and mostly considered traditional.

Beliefs of ICT in Children's Education

Teachers' beliefs about the importance of ICT in their classrooms would influence implementation decisions. This could occur in two ways: (a) The teacher believes that ICT benefits their teaching and learning techniques and (b) the teacher believes that ICT benefits children's skills development. The data acquired in this study confirmed that early childhood teachers had a favorable view of and strong belief toward the use of ICT in their classrooms for both teaching and learning and playtime. For instance, teacher Mashael stated, "I do believe in ICT, especially this time where digital tools and apps are strongly spread and keep spreading around people. Children also learn best while using digital tools and other virtual tools." Similarly, teacher Maha explained, "Yes, I believe in ICT. It enhances learning opportunities, promotes and develops digital skills, and encourages creativity and critical thinking skills."

The participants see ICT as a complementary artifact that enriches their teaching and learning techniques, as well as children's play and learning experiences. They believe that ICT provides opportunities to promote children's developmental skills, along with modern skills. Teacher Ghadah provides a similar statement, "Yes, I believe in ICT and I enjoy using them in my classroom. It increases children's learning desire, provides enjoyment, and easy to deliver information." The participants' beliefs regarding ICT usage go beyond their simple practices. The participants believe in ICT integration for the benefit of both teachers and children.

Thus, it was clear that ICT works as a tremendous teaching and learning method for the teachers and as a play and learning method for the children. Previous studies found similar results (Fonseca et al., 2023; Masoumi, 2015); however, despite their strong belief in ICT, it was recommended that teachers need to develop their understanding and use more and different digital tools and applications to enrich their skills and children's learning experiences and competencies. The above-described factors and strong beliefs toward ICT may be predictive of teachers' implementation; however, these do not really work as a purposeful implementation in modern classrooms.

Obstacles to Integrating ICT Into Children's PBL

Despite the positive attitudes about and beliefs toward the use of ICT in children's play and learning, the data revealed many obstacles the teachers face when integrating digital technologies into their classroom practices. Analysis of the data showed that lack of resources, training, and internet connection were the barriers most frequently shared by the teachers. Teacher Nawal described that "the most issues I face when I use digital technology in my classroom are poor internet connection and the availability of proper technologies in the classroom." A similar answer was conveyed by teacher Mashael, who expressed, "Lack of internet connection, internet goes off during the lesson, and sometimes the time is not enough."

Teacher Areej added, "I feel that time is not enough, and the number of children is big, so it is not easy to manage." Reflecting on participants' experiences and answers, internet connection and time management are

considered obstacles to integrating ICT into children's PBL. It is clear that teachers need to work on classroom management and time management to incorporate ICT more effectively. Recent studies showed that lack of time influences teachers' beliefs about and integration of ICT into their classroom practices (Kaur, 2023). Teacher May highlighted another barrier to integrating ICT: "I personally lack of good training in using ICT and know how to give each child the time they need to use technology in my classroom."

Beside the above-mentioned barriers, teachers Aljawharah and Nourah also stressed, in similar answers, that they lack professional training in using ICT for more effective learning and play experiences and feel like there is a competition between using modern technology and using traditional teaching skills in the classroom. Participants cited lack of personal training, lack of knowledge, lack of confidence, and time limitations as factors influencing their integration of ICT into children's play and learning experiences. These findings are consistent with some previous research studies in similar environment (Kaur, 2023; Ogegbo & Aina, 2020), which emphasize that teachers need to go beyond simple implementation of ICT by developing their technological skills. Attending professional workshops would benefit teachers to extend and maximize their perspectives toward integration of ICT into children's PBL.

Conclusion

This qualitative study investigated the perspectives of early childhood teachers toward the integration of ICT into their daily practices and as part of children's PBL in Saudi Arabia. It was found that participants value the use of ICT in children's education; nonetheless, teacher's practices were simple, and hence, children's experiences were simple as well. Teachers need to widen their perspectives about what ICT is to develop their practices. Teachers also highlighted some difficulties they face when integrating ICT into their traditional teaching methods and techniques. In spite of the difficulties and minimal practices, the teachers showed an interest in developing themselves, their practices, and their perspectives to integrate and implement positive ICT experiences into children's play and learning. This is an era during which generations are growing up using digital technologies everywhere and anytime. Children's experiences with ICT shape their expectations of play, learning, and education in general (Murcia, Campbell, & Aranda, 2018; Ongoro & Mwangoka, 2014; Yang & Hong, 2022).

Fostering ICT knowledge and skills should involve developmentally appropriate practices combined with the curriculum and 21st-century skills (Weber & Greiff, 2023). Thus, the following must be kept in mind: (a) children's developmental stages, (b) children's need to obtain ICT 21st-century skills that can be built upon later in their education, and (c) that ICT implementations should be developmentally and age appropriate, playful and child-centered, child-friendly, and involve the guidance of early childhood teachers (Weber & Greiff, 2023). With these recommendations, it is hoped that this study can guide future research on ICT integration into children's PBL, specifically how ECE teachers should view and implement ICT. Teachers need to participate in professional learning developmental workshops to enhance their perspectives and practices toward the use of ICT and how to integrate it appropriately into children's education.

This study would contribute to the development of early childhood education program and provide insights to the Saudi policymakers and decision-makers, educators, current and future teachers in the field of early childhood education about the current practices performed by current early childhood teachers in the field. These findings would guide teachers to improve their practices and assist their thinking and thoughts to be developed over time while working in the field. Besides, this study has addressed the gaps in valuing technology in children education, as most teachers are not able to practice ICT in teaching nor are they able to benefit from it appropriately. This study recommends to enhance teachers' technological practices through professional developmental programs. These programs could involve both pre-service and in-service teachers. Furthermore, college curricula should include subjects and lessons about technology in children's education to educate future teachers appropriately and prepare them for the field. Future studies are recommended to be conducted in this regard in different cities around Saudi Arabia. As well as, using different methods of data collection and analysis to uncover more and different perspectives.

Acknowledgements

This study is supported via funding from Prince Sattam bin Abdulaziz University project number (PSAU/2025/R/1446).

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