



THE INTRODUCTION OF INFORMATION AND COMMUNICATION TECHNOLOGY IN THE FRAMEWORK OF PRESCHOOL EDUCATION

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Summary 1

The Romanian education system had to adapt to the new challenges generated by the pandemic caused by the SARS COV-19 virus. Thus, preschool teachers are expected to integrate and use information and communication technologies (ICT) in their curricula and pedagogical practices.

The purpose of this study is to explore the pre-school teachers' perception on the application of ICT, using qualitative methodology.

Based on the qualitative data, we started from the question: What is the preschool teachers' perception regarding the possibilities and the limits of the introduction of ICT in preschool education curricula?

The pattern was determined by using the sampling criteria, which is a purposive sampling method. This was used to select 25 teachers (N=25) from preschool education, from state kindergartens. Data were collected through semi-structured interviews, lasting up to one hour, based on the semi-structured interview guide. The interviews were recorded, recorded and transcribed for the main textual analysis, which was based on a thematic analysis, thus identifying three main themes.

Our results show that there is a need for change, where teachers' technological pedagogical knowledge needs improvement in terms of how and when to integrate technology for children's involvement in the instructional-educational process.

Moreover, the teachers emphasized that they expect to be supported through the implementation of a preschool program and several programs aimed at improving their skills in using technology. Teachers are aware not only of the advantages of technology, but also of the potential disadvantages.

Keywords

early education, introduction of information and communication technologies (ICT), pre-school education, Covid-19 pandemic

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Abstract

The Romanian education system has had to adapt to the new challenges brought on by the pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Thus, it is expected of preschool teachers to integrate and use Information and Communications Technology (ICT) in their teaching approach.

The purpose of this study is to explore the preschool teachers' perception on quality usage of ICT.

Based on qualitative data, we have started with the question; "What is the preschool teachers' perception regarding the possibilities and the limits that come with the introduction of ICT in the preschool curriculum?"

The pattern was determined by using the sampling criteria which is an intentional sampling method. This was used to select 25 preschool teachers (N=25) from state kindergartens. The data were collected through semi-structured interviews that lasted up to one hour and were based on the semi-structured interview guide. The interviews were recorded, recorded and transcribed, in order to make the main textual analysis, which was based on a thematic analysis, thus identifying three main themes.

Our results show that there is a need for change, where teachers' technological pedagogical knowledge needs improvement, in terms of how they are supposed to integrate technology for children's involvement in the teaching-learning process.

Furthermore, the preschool teachers have emphasized on their expectations in being supported through the creation of a school curriculum and more programs that involve improving their abilities in using technology.

Preschool teachers are aware not only of the advantages of technology, but also of the possible disadvantages.

Keywords

COVID-19 pandemic, early childhood education, introducing information and communications technology (ICT), preschool.

1. Introduction

The preschoolers of the 21st century were born during the full technological development, they discovered and have been using the online environment from the youngest ages, with unlimited access to information, something that has managed to influence the way they relate to learning, to education.

Due to the crisis caused by the COVID-19 pandemic, both teachers and preschoolers were faced with a challenge, that of properly managing technology to support the educational process.

The evolution of society, the amazing progress of contemporary civilization and the informational explosion, are also felt in preschool education. In recent years, it has met a continuous transformation and development in terms of content, methodology and educational technologies.

Used properly, digital technology can offer remarkable advantages (Dubicka, Martin & Firth, 2019). New opportunities can be offered to both educational institutions and children, having the accessibility of the use of technology for the non-traditional.

In recent years, the use of e-learning in the educational process has seen a rapid expansion. The role of technology in the lives of preschoolers has proved to be useful, but there is still research



that reports problems with teachers' efficiency in online teaching (Bolliger & Wasilik, 2009; Dell, Hobbs & Miller, 2008; Downing & Dymont, 2013; McQuiggan, 2007). Multiple concerns about the appropriateness of technology-mediated education for early childhood educators are still being noted (Dong & Newman, 2016; Howard, Miles & Ree-Davis, 2012; Leung, 2012).

1.1. Information and Communication Technology (ICT)

Information and communication technology (ICT) can be considered an innovation within early education institutions, it is being used for educational purposes through means of presenting, storing and processing information. We believe that this technology, at the moment, is particularly valuable in the instructional-educational process of preschool children. The use of ICT in the educational process allows the presentation, updating and consolidation of knowledge in an active and relaxing way, approaching creativity and novelty. With the help of ICT, the child's attention is kept active throughout the learning and evaluation activity.

In this context, it is denoted that preschoolers, during the period of preschool education (from 3 to 6 years old), which is accepted as the beginning of education in life, are curious and interested in technological products, which include varied colours, moving images, animations, videos and technology products such as computers, tablets and phones. They are drawn to discover, to find out curiosities, they are creative and independent. All these, help children during this period to achieve permanent and fun learning.

Today, technology is a very important factor in accessing information. For this reason, information and communication technologies in the field of education have begun to create new educational environments, offering new teaching methods, changing the relationship between the traditional educator and the child, thus, even leading to an increase in the quality of education.

In many studies, the active use of technology in preschool activities positively affects children's learning and increases motivation (Çakıroğlu & Taşkın, 2016; Huffstetter, King, Onwuegbuzie, Schneider & Powell-Smith, 2010; Kocaman-Karoğlu, 2016; Şahin, 2006; Wolgemuth, et al., 2011).

The integration of technology into education has led to a growing debate about its contribution to children's development, especially in early childhood education. Discussions around pedagogical practices in the technology-mediated environment reveal a diversity of perspectives in relation to the positive or negative contribution to the preschool educational process.

A growing body of research covers the advantages of using information and communication technologies (ICT) in preschool education. Its use has been found to encourage meaningful interactions between preschoolers, leading to improved conversational skills (Hsin, Li & Tsai, 2014). Technology in kindergarten is perceived to positively influence early cognitive development as it affects children's quality of playing and learning by cultivating collaborative skills, curiosity and creativity. In addition, new technologies greatly influence young children's literacy development, control and planning skills, as well as their mathematical thinking and problem-solving skills (UNESCO, 2010).

Researchers Magen-Nagar, Firstater and Schwabsky (2013) state that the integration of ICT in the education of young children leads to improvements in many areas, such as cognitive functions (visual, analogical, abstract and mathematical-logical), literacy, memory,

metacognition and coordination motor-visual.

Preschoolers' acquisition of the knowledge and skills needed in the 21st century has been a priority for many states in the last decade (Yelland et al., 2008), such as the USA (NAEYC, 1996), New Zealand or Scotland (Learning and Teaching Scotland, 2003), they have made substantial progress in the implementation of curriculum guidelines or the preparation and improvement of didactic frameworks in preschool education, with an emphasis on the integration of ICT in the education process and in the endowment of groups.

However, there are significant challenges, that are not going unnoticed by both practitioners and researchers alike. Magen-Nagar and Firstater (2019) note that research on technology use has yet to show any direct correlation between ICT use and children's achievement, regardless of their age. Researchers also note that widespread use of ICT can limit young children's emotional, physical and cognitive development in the long term. There are also concerns about ICT interfering with free play and encouraging individual activities at the expense of social interactions (Cordes & Miller, 2000). Opponents also argue that the communication process is not adequately enhanced in kindergarten children (Hsu, 2016). Furthermore, children cannot directly explore the world actively, sensory and exploratory nature of learning. In order to seek the perspective of educators, various studies have revealed a common concern among teachers about the lack of technical skills necessary to use ICT effectively when teaching using technology (Mills et al., 2009; Wilson, 2004; Wray et al., 2008).

Teachers in Romania have carried out educational activities using digital tools and resources to some extent, so, this situation should not be a novelty for most of them. Moreover, in recent years, the Ministry of Education and its subordinate institutions have promoted several initiatives and programs with a digital component (for example, the Computerized Education System (SEI) program, the eTwinning action, various teacher training programs for technological development, skills, ROSE and CRED projects (Botnariuc et al., 2020).

However, there is no specific national ICT policy for the early education system and ICT professional development for pre-school teachers. In this sense and in line with the educational change of 2020, the Romanian Ministry of Education launched the public consultation process on the Education Digitalization Strategy (SMART-Edu) and suggested a call to action for closer cooperation of all stakeholders for developing digital skills at all levels of education, various open educational resources (OER) and digital educational tools, improving digital infrastructure, supporting pre-service and in-service digital training of teachers, promoting initiatives on online security, data protection, cyber hygiene, IT ethics and so on (MEC, 2020).

2. Method

2.1. Research participants

In the present study, participants were selected based on availability (Teddlie & Yu, 2007). The selection of participants was based on certain criteria, such as: professional experience (minimum of 5 years and maximum of 40 years of teaching experience), teaching in a state preschool education institution, graduation from the Pedagogical High School and/or license in Education Pedagogy primary and preschool.

The participants in this study are preschool teachers (n = 25) who meet the criteria written above and work in similar contexts (11 kindergartens, 3 from Dâmbovița county and 8 from Bucharest city).

The first phase of the sampling process consisted of contacting the 40 teachers by e-mail. The

explanation of the process which was to be carried out and their possible involvement in the research process was provided. Out of the total number, 25 teachers agreed to be part of the research. Table no. 1 provides an overview of basic participant information.

Table no. 1: Presentation of basic information of the participants

Information	participants	Remarks
Gender	Female	The result is representative, because almost all pre-school teachers in Romania are women
Age	23-45	The result is representative, we mention the fact that the vast majority of pre-school teachers start their initial training immediately after completing the pedagogic high school.
Stage of studies	Bachelor in Pedagogy of Primary and Preschool Education (n=17) and Pedagogical High School (n=8)	The result indicates that a large part of teachers want to evolve and continue their studies.
ICT training	Regarding the pre-school teacher training programs, participants had to take introductory courses to acquire basic computer and software skills. These were necessary for an optimal development of the instructive and educational process. Programs carried out by CCD, specialized institutions, etc. (these being free or for a fee).	The result is representative, thus, it is noted that all the participants have basic computer knowledge and skills, such as using Word, Excel or PowerPoint, accessing the Internet, etc., as well as basic knowledge and skills in using specialized software educational field.
Personal use of ICT	All participants have a personal laptop/computer and a smartphone. All have been using social media for more than 5 years.	The result is representative, in a large percentage it was observed that there is access to the Internet, also, mobile phones (smartphones) are the most used Internet access devices among teachers.

2.1.1. Data collection

Data collection involved semi-structured interviews that were conducted with each teacher through the ZOOM software program in August 2022. The duration of the interviews varied between 45 and 60 minutes, and the teachers agreed to be audio recorded for a transcription and better analysis of their responses.

The interview questions focused on the research topic without revealing any privacy information or exploring sensitive topics. The elements of the interview were the following:

- (1) If you could make a list of the first educational platforms used in the group, what would that list include?
- (2) What are the top three positive aspects of using technology in the children's group? Please

describe in detail why you found them beneficial for you, your children. and so on.

(3) Did you receive support from the authorities (local/national) for a better organization of your work? What about the support from the children's families or their own colleagues? What kind of support did you get? Was it helpful or not?

(4) Do you feel that you have something to learn from carrying out activities that integrate ICT? Please elaborate on your answer.

(5) What is the perception of preschool teachers regarding the possibilities and limits of the introduction of ICT in preschool education curricula?

2.1.2. Data analysis

With the help of qualitative content analysis, the data collected from the interview was analyzed (Bernard & Ryan, 2010), resulting in a better exploration of the information gained.

Data that were mainly descriptive were transcribed verbatim and then analyzed. Based on the interview questions and the participant responses, the process consisted primarily of coding meaningful broad categories so that the codes could be broken down into different categories. Through a cyclical process, we were able to list three main themes in the end:

- (1) teachers' experiences during the use of technology in the instructional-educational process,
- (2) teachers' perceptions of the benefits and potential of digital media,
- (3) support for the introduction of ICT in the instructional-educational process.

2.2. Finding

In our study, the data show that all interviewed teachers experienced the use of technology in the instructional-educational process in the group. The content analysis revealed three main obstacles that made it difficult for teachers to use technology with confidence, courage and determination: the lack of competence in pedagogical and technological skills; the integration of digital environments; the poor technological infrastructure.

According to the responses, they all had trouble feeling at ease while using technology, due to the fact that they did not believe they had the appropriate knowledge and skills to properly conduct an educational process for young children in a technology-enabled environment. We know that the educational institutions in Romania, especially the state ones, are currently based on the use of traditional teaching and learning methods and follow the traditional organisation of face-to-face activities. Therefore, even if the teachers had prior knowledge of how to support an activity with the use of technology, they did not have the opportunity to practice the necessary skills in a real and daily setting. Therefore, we believe that their fears are justified, as one of the teachers pointed out: "Every day I access the Internet, it is something natural, especially since its use on the phone is indispensable. I use and know how to write a Word document or how to create a PowerPoint presentation, but when I started making various materials that I could make with the help of technology, I realized that it is a whole other world to be able to create content for small children with only what basic knowledge I had. [...] I remember when I wanted to make a presentation of a story using a known platform, the first few attempts were to figure out how to insert the images on the pages while recording the voice, or to determine at what time interval for a different image to appear.[...] I was certainly not prepared for this..."(Preschool teacher).

We believe that the use and integration of ICT in preschool education has found teachers both poorly equipped in terms of pedagogical knowledge on how to integrate digital media into



young children's activities and, moreover, how to achieve the desired result by creating new, exciting content. Only a few participating teachers had used various platforms or software in their work with preschoolers.

The task of integrating and using technology in the educational process in the preschool education level, is not a simple one: teachers try to carry out online teaching, starting with its transition, its development and its implementation. (Rennie & Morrison, 2013). The successful integration of teaching and learning with the help of digitalization is a more complicated phenomenon than the simple use of technological devices, an aspect that was also highlighted by the teachers: "I admit, it was difficult for me, at the beginning, to integrate ICT in my teaching. I knew you could do it in a short amount of time, obviously, just at the surface level. I've always thought that if you want to do it right, to be able to have a positive impact on the child and to follow the development of certain aspects, then first of all you have to be really focused on it. But most of us, the teaching staff, had to use them in a very short time, being pressured by the pandemic situation." (Preschool Teacher).

Being able to maintain interest, capturing children's attention through activities carried out with the help of ICT, is also a situation that has often caused stress for teachers. Many of them noticed that after the first two months, the children began to memorize parts of the activities, participate actively and be curious and engaged in what was going to happen. Some teachers even mentioned that some children were impatient to answer, to participate in these activities. One of the teachers confessed that: "As the children and I got used to using technology, I unconsciously started to focus more on demonstrating various aspects on the screen, introducing characters from my favorite animations, I discovered the websites that helped me, for example, to create puzzles that preschoolers could solve using the interactive whiteboard. Preschoolers immediately felt the attraction to the novelty. (Preschool Teacher).

At the same time, one of the participants confessed that: "It is a good thing that technology is used in early childhood education because online services have become an important part of everyday life. But, I strongly believe that we should not devote too much time to these digital media..." (Preschool teacher).

One area of dissatisfaction is that related to poor technological infrastructure. For example, teachers confessed that school units had difficulties in providing access to appropriate digital equipment for educational activities, not to mention the lack of internet connection (or a poor connection) and training in its use.

However, it was more difficult for teachers to explain the benefits of using digital media when carrying out an educational activity. They recognized the advantages of ICT in a somewhat limited way, they had mainly focused on the children's enjoyment when interacting with ICT, at least, during those first few uses. There were times when teachers started looking for fun and active games that brought them great involvement from the little ones. The digital media environment provided flexible learning opportunities for all children because now, as some teachers stated, they have had more time to adapt each activity to each child's strengths: "I can be honest and say that during the first uses of technology, I was not able to find any advantages. Everything was so difficult. And I think the fear of failure was what made me repeat, until I reached the desired result." (Preschool teacher).

The teaching staff mentioned the fact that, in all cases, there was important support, the most significant initiatives came from families, colleagues, town halls, local councils. Facilitating the use of new technologies in educational contexts through platforms, applications, tools that were made available on dedicated websites, but also online seminars (webinars). The help of other educators was particularly noted in the responses of the participants. Teachers struggled

to adopt strategies specific to the digital environment to overcome the obstacles encountered by themselves and other colleagues; and in this way, small communities of teachers were quickly created with the aim of facilitating mutual professional experiences.

3. Discussions and conclusions

The present study was made with the intention of understanding how the use of technology is perceived in the educational process, in preschool education.

Three topics were explored:

- (1) the experiences of preschool teachers during the use of technology in the instructional-educational process,
- (2) teachers' perceptions of the benefits and potential of digital media,
- (3) support for the introduction of ICT in the instructional-educational process.

The data indicate a good understanding of teachers about how technology can be properly integrated into kindergarten activities, but it is noted that some had not previously acquired the appropriate knowledge and skills in this regard.

If their training had offered more opportunities for blended or technology-based teaching and learning, they would not have experienced so many challenging moments.

We note that the use of technology in activities with kindergarten children is different due to children's poor reading and writing skills and learning methods are mainly based on visual representations and auditory means. At the same time, the new context related to technology constrains children's direct tactile and practical experiences.

A concern of several educators was the negative effects of prolonged use of technology by young children, but at the same time, they testified that if they had had the prior skills to integrate it into teaching, the afterthoughts would have been completely different and on a more positive note.

However, professionals also pointed out some benefits associated with this way of teaching and learning, mainly related to children's curiosity for the new means of passing of knowledge. The technology landscape is now thriving. But, regardless of the help offered by touch-screen technologies and educational applications, in the educational process, many aspects have remained unexplored.

We state that one thing is certain: the use of technology is constantly on the rise, we believe that now is the right time to make more firm and meaningful educational and digital changes.

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