

PRE-SCHOOL TEACHERS' ATTITUDES TOWARDS IMPACT OF ICT ON STUDENTS

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Abstract. *The application of ICT in today's context of constant change and sustainable development of mankind is a necessity, expressed in the importance, timeliness and meaning of its integrity in the educational process for children. The latter acquire the knowledge needed for the use of ICT more deeply than adults and can easily apply it to various activities. Computer literacy is one of key aspects of societal development, ensuring the need for ICT skills for the present and future. In the face of the Covid-19 pandemic and the challenges of distance learning and teaching, the researches into the interaction of children with ICT, and especially the importance of computer games for the development and education of children, is becoming of paramount importance.*

The study aims to reveal the attitudes of pre-school teachers towards impact of ICT and computer games on students. The results of the research, based on the assumption, represent the attitudes of teachers on the application of ICT tools in pre-school education. A qualitative approach was applied to the study – focus groups with 48 pre-school teachers. The results of the research reveal that the ICT and computer games has significant impact on preschool children in the self-learning process, by changing their knowledge, skills, behaviour and attitudes.

Keywords: *computer games, focus group, ICT, pre-school education, self-learning.*

Introduction

Computer literacy is a set of skills necessary in modern society. Marsh (2010) emphasizes that the lives of modern children are shaped by their involvement in the use of information technology. Modern children are often referred to as the digital generation (Lee, 2004). Technologies are also inseparable from the daily lives of pre-school children (Attewell et al., 2003; Bolstad, 2004; Sehnalová, 2014). According to Gulay (2011), pre-school children get to know to a computer at home and spend time on it. Researches (Samaras, 1996; Lally, 2001) note that the integration of modern information technologies into the education of pre-school children is crucial. Winters & Vratulis (2012) also emphasizes the ability to use information technologies at pre-school age.

The main personality traits are formed in the first 4-5 years of a person's life. Childhood is such a stage in life that provides the foundation for further human life. Essential skills are acquired during this period of personal development. According to Couse & Chen (2010) children develop most rapidly in early childhood (up to 8 years), so the use of information technologies to teach this age range is very effective. As Shawareb (2010) notes, collaboration between teachers and educators is essential to encourage children to use information technologies from an early age. Computers can be a great educational tool for children, and information technology is essential to keep up with today's pace of life.

The advantages of computer use for early education are analysed in Siraj-Blatchford & Whitebread (2003), Marsh (2005, 2019), Yelland (2007), Lee & O'Rourke (2006), Dwyer (2007), Copple & Bredekamp (2009), Wang (2010), Yilmaz & Alici (2011). The influence of computer games on changes in learners' knowledge, skills, behaviour and attitudes is based on Rondon et al. (2013), Bottino (2007), Anderson et al. (2007), Shute (2011), Sălceanu (2014).

The aim of the research is to reveal the opinion of pre-school teachers on the impact of the computer used on children in the child's self-learning process.

The problem of the research. The use of ICT in early childhood raises debate, while emphasizing the positive influence of ICT and especially computer-based games on the development of children's language, communication, creativity, problem-solving, critical thinking, and at the same time justifying the negative impact on children's social and emotional development (Ju et al., 2018; Krueger & Casey, 2000; Ang & Zaphiris, 2007). The application of computer-based games learning techniques in early children's education in the scientific community is a subject of discussion. The teacher opinion researches reveal that the latter view "threat to real communication or other more important traditional practices, such as play-based learning" (Aldhafeeri et al., 2016; Gray & Palaiologou, 2019). The following problematic questions are raised – how does the use of computers affect the daily activities of early age children? How important is ICT for pre-school children?

The article presents qualitative analysis of the focus groups of 48 pre-school teachers from Vilnius, Kaunas, Šiauliai district, employing the method of content analysis which enabled objective and systematic investigation of the features of the text, generalisation of information and formation of appropriate conclusions. Data from qualitative opinion survey were analysed from September to November 2021.

Theoretical Basis of the Study

Studies by foreign researchers reveal that ICT has shown to be a valuable educational tool for early learning and development (Dong & Xu, 2021; Saçkes et al., 2011; Yelland, 2007), where the ICT skills of children are sufficiently

developed, as many of them “can use the keyboard and computer mouse properly” (Crook, 1992; Shimizu & McDonough, 2006; Stronmen et al., 1996). According to Stephen & Plowman (2008), children who have effectively learned using information technologies at pre-school age continue to successfully apply them in further learning.

Studies show that countries such as England, Portugal, Sweden and Denmark have enacted educational laws that provide for pre-school education using information technology (Stephen & Plowman, 2003; Anderson, 2000). UK education laws require children to be taught using information technology from an early age. Information technologies and various educational games should be included in early children’s education curricula (Howard-Jones & Demetriou, 2008). According to Crombie et. al. (2000), the ability to use and work with information technologies (a computer) is needed not only in learning but also in working. According to Colker (2011), Clements & Sarama (2002), computer literacy skills are essential in today’s society.

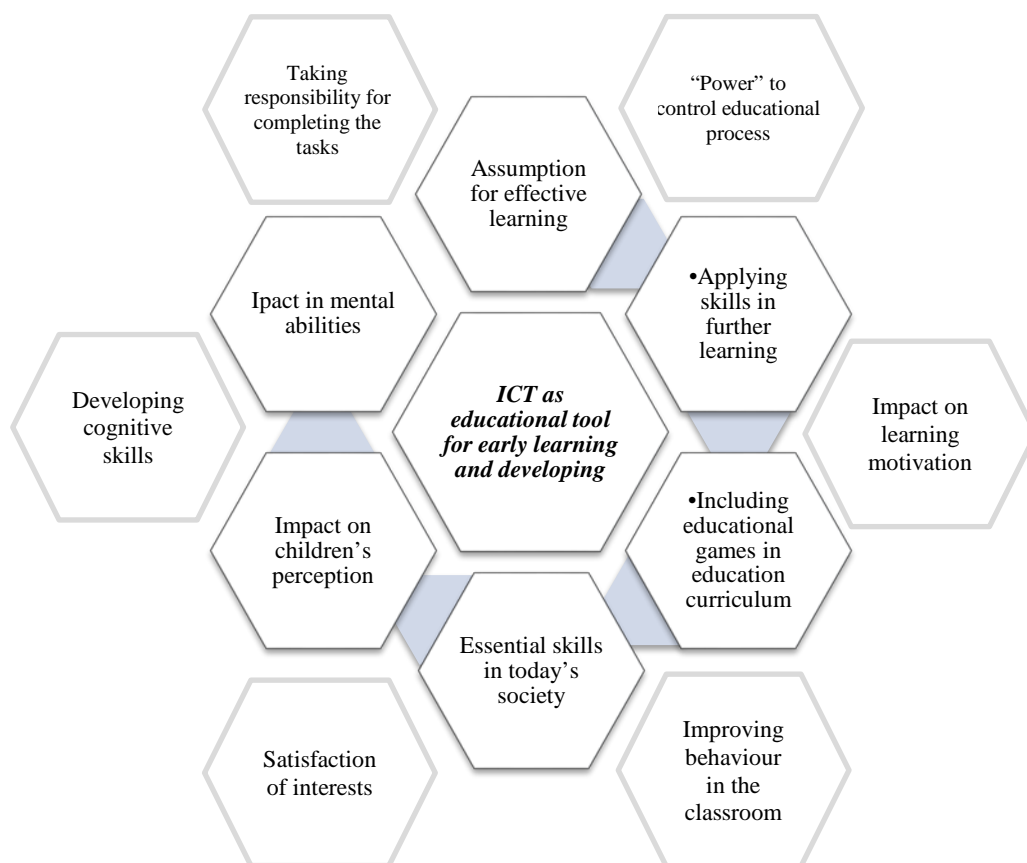


Figure 1 Theoretical model of ICT in children’s educational process
 (designed by the authors, according to Colker, 2011, Clements & Sarama, 2002, Bolstad, 2004, Hatzigianni & Margetts, 2012, Li & Atkins, 2004, etc.)

The effectiveness of the use of ICT in children’s educational process (Fig. 1) is based on research data emphasizing factors in children’s perception (Shawareb,

2010), mental abilities (Li & Atkins, 2004), and motivation to teach/learn (Hatzigianni & Margetts, 2012). As Shawareb (2010) notes, “children who have access to a computer at home have more developed cognitive skills than those who do not use a computer at home”. Computers and interactive learning apps “help children learn, contribute to the development of perceptions, and promote the development of mental abilities” (Shawareb, 2010).

According to Bolstad (2004) and Anderson (2000), when working on a computer, children choose which tasks they want and can perform, and they also take responsibility for completing the selected tasks. Children feel they have the “power” to control their own educational process. Self-confidence gives children the knowledge that the computer will not criticize for mistakes, respect their pace of learning, give them enough time to think and choose the answer ensures self-confidence (Hatzigianni & Margetts, 2012).

Hatzigianni & Margetts (2012) and Li & Atkins (2004) highlights *the advantages of computers for early education*: satisfaction of interests, motivation to learn, memory development, higher personal efficiency, better learning outcomes. According to Lieberman et al. (2011), active video games can improve student learning results, reduce cases of missing classes, and improve behaviour in the classroom.

Research Methodology

There was a qualitative opinion survey of teachers conducted in September-November 2021 in focus groups with 48 pre-school teachers from Vilnius, Kaunas, Šiauliai district. The chosen method of the study allowed to gather and expand participants' insights into the subject matter in a neutral environment (Nyumba et al., 2018). The teachers involved in the study have the same characteristics, i.e. they work in a pre-school education institution, have more than 5 years of experience in the application of computer tools in the educational process of pre-school children. The group discussion was organized in the auditory of the High School Library in Šiauliai city, where the group moderator held a controlled and structured discussion according to a clear plan. In order to manage the discussion and its environment, there was another researcher involved who recorded the group conversation, ensuring that the collection of information was in accordance with the established structure and procedure for interpretation.

The focus group approach provided the researchers with the prerequisites to gather more general, more open data, different opinions of teachers, compared to individual interviews. Participants in the study openly discussed about the education of today's young children in a smart technology society, the influence on children of computer used in the self-learning process.

The content analysis method was used for the analysis of the research data. The data obtained during the focus group is presented in an audio recording. The

content of the discussions was transcribed in protocols. The analysis has been conducted by consistently analysing the content of a text, dividing the content under investigation into analytical units, i. e. categories, sub-categories. The latter are coded (e.g. [1] etc.) according to the order of reflections presented by the surveyed, aiming at anonymity of the research participants.

Research Results

The analysis of empirical research data has highlighted the essential categories of children's self-learning through computer games and computer tools (Fig. 2). In particular, pedagogues emphasize that spending a lot of time on computer games **makes the children's language poorer**. It is noted that the *words are abbreviated*, "for example, they say – "check" and that means "good". Such words are learned from some computer apps. Children abbreviate Lithuanian words such as "gers" (good), "okis" (Okay), "what's up?" (how are you?). Another problem is the transfer of the meaning of words [7]. The abbreviation of words "is not an adult language. When a child speaks in short words, it is indeed computer things" [4]. The *use of jargon in spoken language* is also emphasized. For teachers, it is important that "children know how to speak beautifully, not only imitate, but also learn to think. However, the computer has the opposite effect – the child comes into the group and uses jargon. Only after a while we can decipher what they are talking about" [9]. Not only the language of children is affected, but also the thinking, when "thinking is no longer in the terms taught, but in the words of the characters of computer games, and this is surprising – those words impoverish everything – they no longer know how to express emotions, everything is dramatized, exaggerated and false" [11].

The adoption of the language of computer games is based on the view of pedagogues that children "speak in some vague terms" [5], "imitate heroes, characters, their language, their phrases" [19]. Teachers find it difficult to understand the context and meaning of words because they themselves do not play animated or other games" [5]. "Today's kids are from another planet. Such things severely restrict education, even though we have almost got accustomed to these foreign words" [14]. They "do not learn to speak fluently, which may lead to the fact that they will also not be able to write later, because they will speak in foreign words" [19]. The *speech distortion with foreign words* is revealed "when watching or playing violent games, they begin to speak those terms of killing and non-Lithuanian, for example, 'kill', 'dead' and so on. [3]. Teachers note that "we especially hear the terminology of computer games very often. We can even say that it becomes a culture of communication between them, a kind of code of communication" [2].

The *narrowing of the vocabulary* is also distinguished, where children "speak less, demonstrate and mimic emotions more that are not good. They are

like small children with an unreal language world, which complicates their educational process" [8]. "The language of children is very poor" [9], "they lack words, many things are quickly forgotten, and when talking to other children, instead of Lithuanian words, most often they use computer terms, such as "support", "encourage" [30].

The significant content of the category **Promoting Aggressive Behaviour** reveals how children embrace the images, emotions, patterns of behaviour depicted in computer games, engage in cruel, rude behaviour. The accent is placed on *adoption of computer imaging*, where "modern children are looking for innovations, things different from what we did in childhood" [1], "show that they are moving to a different level, or that fights are acceptable and thus feel important" [13]. "The problem is that images are not created from the natural or adult world, but from computers, negatively affecting the child's behaviour due to harmful material, factors" [1]. "Their language is sometimes artificial. Imitation of computer characters is unnatural, inconsistent with reality, manifestations of violence are evident in behaviour, not realizing the consequences of their own actions. It is said as communication is understood" [7].

The *adoption of aggressive patterns of behaviour* is based on the opinion of pedagogues that "children gradually begin to behave aggressively, interacting with each other through computer games. It is evident that they take on negative patterns of behaviour from various films and computer games" [17], "have difficulty adapting to life [3], because "computer games and the Internet distort the sense of reality, children behave unconsciously" [32], "overestimate their capabilities – think that it is possible to go wild, to attack" [3]. Doubts are also expressed in the quality of education, when "the elementary discipline in the group must be observed [32], "it is difficult to manage the group, the educators become less interesting" [25].

It is emphasized that the children are *characterized by cruel behaviour*, where "computer games and various apps that do not have any specific educational purposes have a negative effect" [8], "children, not by their age, become more cruel" [13] - they abuse, swear, push each other [8]. Also *rude behaviour* is distinguished, which "is noticed in daily activities - they talk harshly to their parents or grandparents, and among themselves, "go too far" with each other, communicate carelessly enough and do not think that this can offend another. Rudeness can be described as one of the harming factors" [17].

The change in the **emotional world of children** is based on *emotional instability* and negative emotions, such as anger, irritability, excessive sensitivity. Teachers emphasize that "children become emotionally sensitive – they react nervously to comments, are as if they have not slept" [6]. "Some children have already been sent to the special service to check whether they have any emotional and behavioural disorders [23]". This is due to the fact that children "spend too

much time at computers and play negative information games that only destroy their emotional world, instead of creating it” [6].

Negative emotions manifest through sensitivity, which “is not empathy for another’s pain or kindness. This is negative sensitivity – irritability, when children shout, get angry in the educational environment” [23]. The role of the family is also emphasized, noting that “children’s families are educated, but parents are very busy, as a result of which children use computers without limits” [23]. It is emphasized that “modern children are angrier” [2]. They are “irritated unlimitedly, after watching and playing shooting games” [7]. Especially high sensitivity – excessive reaction to the environment, excessive sensitivity...” [17].

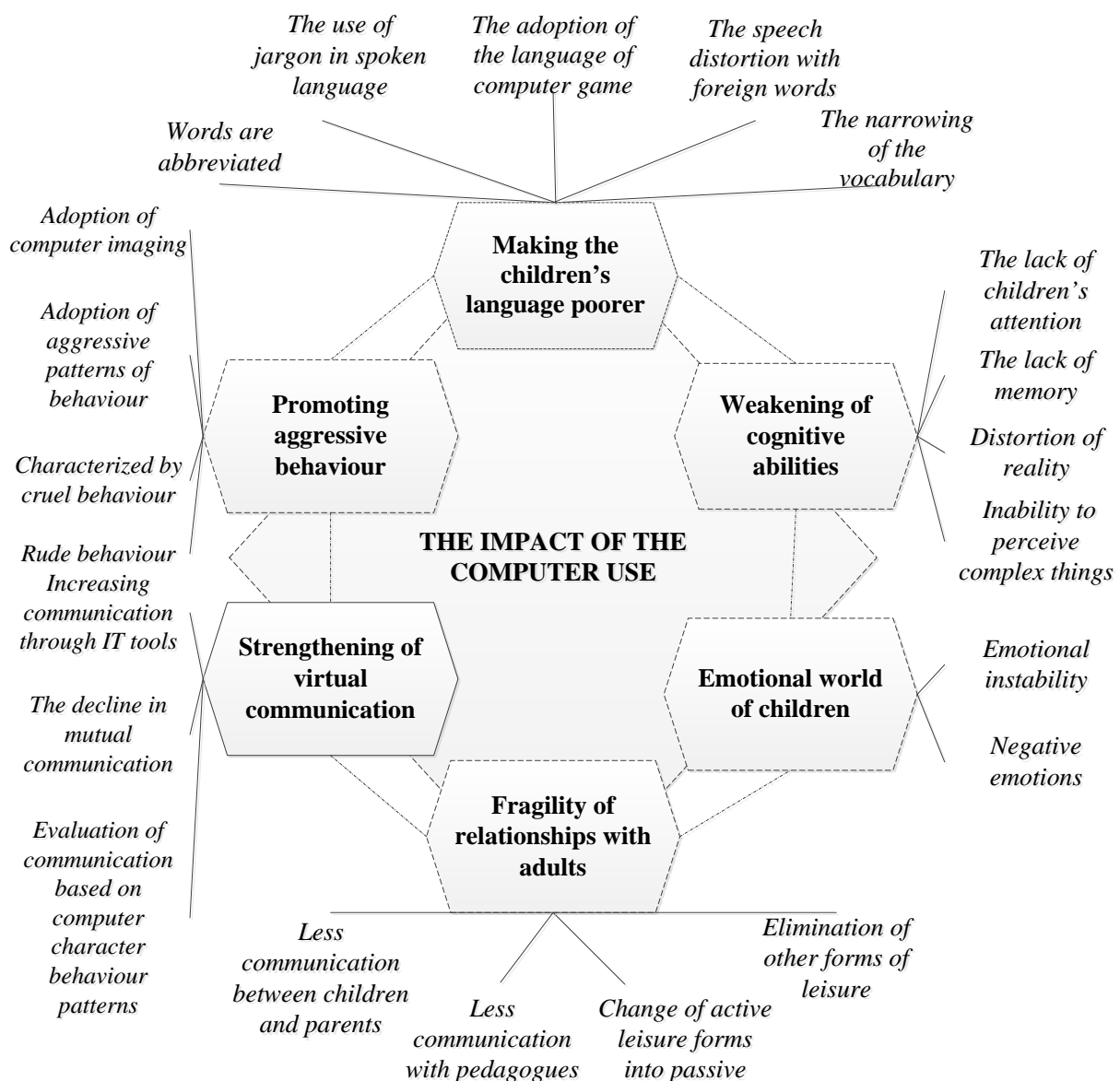


Figure 2 Schematization of the impact of the computer use (designed by the authors)

The content of the category of the **weakening of cognitive abilities** is expressed by *the lack of children's attention, the lack of memory, distortion of reality, inability to perceive complex things*. Pedagogues emphasize the *lack of children's attention*, when the latter face “more difficulties in learning in groups because they are unable to concentrate” [16], “more difficult for them to focus [30]”. “This is surprising, because children are only interested in the computer, which is more harmful than beneficial. Therefore, the concentration of children's attention becomes a modern problem, when it is difficult for teachers to control children's behaviour and the educational process becomes obnoxious” [16].

There is a *lack of children's memory* when it is noted that “children simply do not remember many educational things. It's like a vicious cycle – they don't remember or cannot focus. The children during the group classes are distracted and dispersed like aspen leaves. Therefore, they cannot memorize” [8]. It is noted that children “remember facts about games on computers well, but they do not correspond to the reality. Real life doesn't interest them. Practice shows declining trends where children with less care and attention at home spend their entire time in front of computers” [19].

The **strengthening of virtual communication** is reflected in the *increasing communication through IT tools*, where “children are increasingly communicating with one another only through Skype, Facebook, by e-mail” [17]. Also *the decline in mutual communication* is emphasized, where children “play less with each other, outdoors, communicate less by seeing each other, and communicate more on the computer” [1], “play more computer games [4]”. “This is very worrying because children lose the joy of communication” [17].

Pedagogues emphasize the outstanding *evaluation of communication based on computer character behaviour patterns* in children's behaviour. “Children think in a complex, unusual way, and they choose friends according to the similarity with the character [9], “want to communicate like characters.” Previously, children communicated through personal stories. Now, when communicating virtually, the violent aspects of communication come to light” [26], the children “are angry and say the phrases of the characters” [9].

The category of **fragility of relationships with adults** is based on *less communication between children and parents*, and *less communication with pedagogues*. It is emphasized that “parents themselves complain that children lack communication with their parents, they lose contact” [11]. The more children communicate virtually while playing computer games, the more they lose contact with others. They do not communicate adequately with adults, they simply do not find a common ground” [8]. “Children take an example from various computer games, when they should take an example from adults” [15]. It is also noted that “children are more interested in computers than educational activities, parents and educators, and that appears in the second plan” [6].

The name of the category **Time at the computer** implies about the change of active leisure forms into passive. It is emphasized that free time is no longer spent outdoors, “children have disappeared from the courtyard – you will never see such phenomena in the city – children are somewhere else, and everyone understands that they spend their time at computers [17]. “Children are becoming increasingly computerized” [10], “they are constantly sitting at the computer at home” [3]. “Sometimes it seems that they will sink into that reality and confuse everything” [24].

The *elimination of other forms of leisure* is based on the children’s “unwillingness to play with each other, to communicate live, to go out and entertain less often, because they compensate that with computer games” [14]. “Sometimes it seems that children are less and less interested in the everyday things that are associated with their free time, i.e. dancing, singing, attending circles, most children realize themselves by playing computer games” [15]. It is emphasized that “children only sit at computers” [19], “spend a lot of time there” [9].

Conclusions

In the pre-school education process, the use of ICT activates children’s cognitive processes – promotes perception, mental abilities, activates attention and memory. Students have a higher motivation for learning, a higher self-esteem. ICT promotes child development in physical, mental, cognitive and social aspects. In the educational environment, the application of ICT facilitates the work of the teacher, as it allows to check the tasks, to evaluate the ability of students more accurately, to diversify the lesson. Educational activities using ICT are more effective.

ICT and computer games affects pupils physical and psychophysical health (emergence of aggressive behaviour, negative emotions), language skills (narrowing of the vocabulary, distortion of the Lithuanian language), cognitive abilities (lack of concentration, memory impairment), communication skills (elimination of live communication, evaluation of a person according to computer game character models), changes in values (changes in leisure perceptions and forms) and relationships (changes in communication with adults).

Although the researches discussed testify to the effectiveness and necessity of ICT application in the alpha generation education process, the experience of preschool teachers reveals the difference between the recommended ICT application in early childhood education and the virtual life of students outside the educational institution, i.e. in the home environment. ICT and educational computer games, which must be the source of knowledge, creativity, motivation, better self-esteem and other elements, become the opposite. The stimulated ideas of the study participants and their contextualization provided researchers with

additional information for future qualitative researches on solutions to the presumptions and possibilities of the transmission of educational content in educational computer games.

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