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Tecnologías de la comunicación en el entorno familiar de niños de cuatro años (Eslovenia)

Communication Technology in the Home Environment of Four-year-old Children (Slovenia)

Abstract

Nowadays, we cannot ignore the fact that young children are overrun with technology. Only proper action and a positive attitude from adults can prevent potential negative consequences, and prepare the child for a life where the usage of information and communication technologies (ICT) is necessary for an individual's social success. We believe that it is important to investigate the child's interaction with ICT at home, for we are certain that ICT has a great impact on the child's early development. This article reports represents the child's access to information-communication technology, its usage at home, the influence of the child's ICT usage on his or her development of competences, and the child's relation with the ICT at home. The data were gathered with the help of 130 parents who filled out a questionnaire and provided us with their opinions about their four-year-old children and their usage of ICT at home. The data were then analysed with the SPSS (Statistical Package for the Social Sciences) computer programme. We found that four-year-old children regularly encounter ICT in their home environment. Besides that, we were also interested in whether there exist differences according to the child's gender and the parents' level of education. Moreover, we present the parents' opinions and suggestions for further studying of this issue.

Resumen

Hoy en día, no podemos ignorar el hecho de que los niños pequeños están demasiado expuestos a las tecnologías. Solo una acción rápida y una actitud positiva por parte de los adultos puede prevenir consecuencias potencialmente negativas, y preparar a los chicos para una vida donde el uso de tecnologías de la comunicación (TIC) es necesario para el éxito social del individuo. Creemos que resulta importante estudiar la relación de la infancia con las TIC en casa, porque estamos seguros de que las TIC ejercen un gran impacto sobre el desarrollo temprano de los niños. Este artículo representa el acceso infantil a las tecnologías de la información y comunicación, su uso en casa, la influencia del uso por parte de los niños de las TIC en su desarrollo de competencias y la relación del niño con las TIC en el hogar. Los datos se recopilaron con la ayuda de 130 padres que rellenaron un cuestionario y nos proporcionaron sus opiniones sobre sus hijos de cuatro años y su uso de las TIC en el hogar. Los resultados fueron analizados con un programa por ordenador SPSS. Nos dimos cuenta de que los niños de cuatro años regularmente encuentran TIC en su entorno familiar. Además, estuvimos también interesados por si había diferencias según el sexo de los chicos y el nivel educativo de los padres. Además, presentamos las opiniones de los padres como propuestas para un posterior estudio de este tema.

Keywords / Palabras clave

Communication technology, pre-school child, home environment, competences, ICT, literacy, digital competence, early development

Tecnologías de la comunicación, preescolar, hogar, competencias, TIC, alfabetización, competencia digital, desarrollo temprano

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1. Introduction

Information-communication technology (ICT) has in the past few years become an indispensable part of modern society. It allows us simple and quick access to information, and eases the communication processes. Besides mediating information and communicating it also helps develop individual's competences and learning skills. Among these is digital competence (Punie, 2007), which is an important part of life-long learning (Making a European Area of lifelong learning a reality, 2001). Digital competence is of great importance, for it contributes to a successful life of each individual (Markovac & Rogulja, 2009). We have to be aware that ICT is not only used by adults, since also the youngest children can come into contact with this special type of technology. McPake, Stephen and Plowman (2007) describe children as active members of the so-called «e-society», which is based on digital connectivity. This society dictates their lives, although they are probably not aware of it. Because ICT is becoming a widespread phenomenon, experts find it irresistible to study. Several studies explore the influence that ICT has on the child in the kindergarten, but none of them deals with the child's usage of ICT at home. When we started studying the child's home usage of ICT, we used a wider concept of ICT, which reaches beyond computers and mobile technology, and which includes a variety of everyday technologies also accessible for children. These technologies are: televisions, electronic toys, interactive boards, playing games, various players, digital or video cameras, cameras, printers, and all other devices the child can encounter at home. All these types of technologies were chosen because Nikolopoulou, Gialamas and Batstuta (2010) believe that they acquaint the child with the concept of interactivity, which is also one of the most important features of ICT. Interactivity is the possibility of active participation in the process of communication between its partakers (Hoffman and Novak, 1996), in our case, even four-year-old children.

For this reason, the purpose of our research was to find out how many types of ICT the child's family owns, the nature of the child's access to ICT at home (limited or unlimited), how the child uses ICT at home (independently, needs help, does not use ICT at all), how often the child uses ICT at home, the influences on the child's usage of ICT at home, the influence of the child's usage of ICT on his or her development, the child's attitude towards ICT at home, and the parents' awareness about ICT usage in general. In doing so, we tried to find differences according to the child's gender and parents' level of education.

2. Material and methods

We used a descriptive method and a causal, non-experimental method of empirical pedagogical research. The study was implemented on a sample consisting of 130 parents (83.8% females and 16.2% males; 53.1% with a high school education and 46.9% with higher education qualifications; 46.9% were parents of girls and 42.8% of boys) of four-year-old pre-school children who attend kindergartens all over Slovenia. They filled out a questionnaire and demonstrated the child's general access to ICT, its usage and the relation that the child has towards ICT at home. With the help of the literature we first composed a draft questionnaire, which was tested after a rational evaluation. We eliminated all possible mistakes and imperfections. We tested the questionnaire in February 2011. The final questionnaires were given to parents in April and May 2011. The survey was anonymous.

The data gathered with the questionnaire were then computer analysed with the help of a SPSS (Statistical Package for the Social Sciences) program. We used a method of descriptive statistics for all the questions. We defined absolute (f) and percentage (f %) frequencies, and the data were then displayed in tables. The dependent relations between the variables were tested with a χ^2 - test. For the analysis of the data gathered by evaluating scales we used the Mann-Whitney U-test.

3. Results

3.1. The presence of ICT in the home environment of four-year-old children

As mentioned before, the broader definition of ICT encompasses various electronic devices, media products and their applications. Nowadays, almost every family can afford most of these products and devices, among which some are intended especially for children and others for other family members. Nevertheless, the child can still access and use them together with other family members.

Type of ICT	Family owns		Family does not own		Total	
	F	f%	f	f%	f	f%
TV	129	99.2	1	0.8	130	100.0
Computer	123	94.6	7	5.4	130	100.0
Printer	104	80.0	26	20.0	130	100.0
CD or DVD player	122	93.8	8	6.2	130	100.0
MP3 player or iPod	62	74.7	68	52.3	130	100.0
Mobile phone	128	98.5	2	1.5	130	100.0
Digital video camera	55	42.3	75	57.3	130	100.0
Digital camera	120	92.3	10	7.7	130	100.0
Gaming consoles	32	24.6	98	75.4	130	100.0
Portable gaming consoles	42	32.3	88	67.7	130	100.0
Programmable toys	102	78.5	28	21.5	130	100.0
Simulation toys	105	80.8	25	19.2	130	100.0

Table 1: Numbers (f) and structural percentages (f %) of the parents' answers to the question: "Which types of ICT does your family own?"

This table shows that almost every family owns a television (99.2%), a mobile phone (98.5%), a computer (94.6%), a CD or a DVD player (93.8%), a digital camera (92.3%), and a printer (80%). In approximately three quarters of all cases families own MP3players or iPods (74.7%), and just under half the have digital video cameras (42.3%). The fewest number of families own gaming consoles (24.6%) and portable gaming consoles (32.3%). We are glad to see that a lot of families also possess ICT intended especially for children. A total of 102 (78.5%) families own programmable toys (remote-controlled cars, robots, talking dolls...), and even more (80.8%) own simulation toys (children computers, cash-registers, irons...).

3.2. The child's access to ICT and its usage at home

The child's access to ICT at home can be physically restricted or non-restricted. Usually access is not restricted in the case of the child's toys or things that the child uses habitually. On the other hand, ICT access can be limited in several different ways if these devices are placed out of the child's reach (on high shelves, or behind closed doors), while older brothers and sisters even hide their personal ICT.

Child's access to ICT	Gender	\bar{R}	$ z $	P
TV	female	66.55	0.418	0.676
	male	64.15		
Computer	female	70.75	2.267	0.023
	male	58.77		
Printer	female	68.42	1.389	0.165
	male	61.75		
CD or DVD Player	female	69.79	1.689	0.090
	male	60.01		
MP3 player or iPod	female	66.38	0.528	0.598
	male	64.38		
Mobile phone	female	70.82	2.440	0.015
	male	58.69		
Digital video camera	female	68.05	1.625	0.104
	male	62.24		
Digital camera	female	69.10	1.804	0.071
	male	60.89		
Gaming consoles	female	67.05	1.057	0.290

	male	63.52		
Portable gaming consoles	female	69.38	2.761	0.006
	male	59.96		
Programmable toys	female	73.16	3.155	0.002
	male	55.68		
Simulation toys	female	67.15	0.694	0.488
	male	63.39		

Table 2: The results of the Mann-Whitney U-test of differences in the parents' statements from S₁ to S₂, according to the gender of the child.

The results for the child's access to ICT at home were not surprising. In more than half the examples children have free or unlimited access to ICT-toys, while on the other hand they find it harder to access ICT devices such as gaming consoles, digital video cameras and digital cameras, that is, those devices that are harder to use and which are usually used only by the adult family members. In approximately half the examples children also use TV and CD- or DVD-players. A more detailed review of the data also revealed that, in this example, girls' ICT access was more physically restricted than that of boys.

We were also interested in why parents restrict the child's access to certain types of ICT. Although they have stated numerous plausible reasons (complicated usage, access to functions that are vital for the operation of the device, access to delicate information and contents, damaging the ICT device...), most parents state that the major reason for restricting the access to ICT is their fear that the device will be harmful for the child. Parents fear that the usage of ICT will harm their child.

Because a lot of children need help using ICT, we wanted to discover who most often helps them. The results have shown that help is most often given by the parents, but also by older brothers or sisters, and even grandparents. A lot of parents believe that ICT has educational value (Rideout, Vandewater & Wartella, 2003). Kirkorian, Wartella and Anderson (2008) consider that parents should not limit the child's interactive experience with ICT, since it helps to sustain the child's interest in an activity. Of course we expected that it would be the parents who most often help their children, for they are the closest to them, and they spend a lot of time with them. Here, we have to state that ICT should not be used as "digital babysitters", and cause unnecessary damage (Plowman, McPake & Stephen, 2010).

3.3. The development of a child's competences through ICT usage

It is difficult to determine when a child should start using ICT. We chose four years of age, because the majority of studies show that after this particular age a child's usage of ICT starts to increase. The fourth year of life most likely denotes the beginning of a critical period that is important for a child's learning with ICT (Wartella, Lee & Caplovitz, 2002). Until recently, learning with ICT was mostly associated with the concept of distant learning, but this is not the case anymore. The concept of learning with ICT is changing. ICT is also more and more present in the homes of children, where learning with ICT happens naturally and enhances the development of important child competences. By using ICT, the child develops competences by which he or she can operate in a digital society. The level of these adopted competences depends upon access to equipment as well as upon the support, interest and engagement of family members. McPake et al. (2005) established three general categories of ICT competences: technological, cultural and learning.

Based on this, we were interested in which competences a child develops most by using ICT.

Competences	ICT most develops		ICT partially develops		ICT minimally (or does not at all) develops		I do not know		Total	
	f	f%	f	f%	f	f%	f	f%	F	f%
Motor competences	26	20.1	70	53.8	28	21.5	6	4.6	130	100.0
Learning competences	32	24.5	76	58.5	11	8.5	11	8.5	130	100.0

Language competences	30	23.1	64	49.2	30	23.1	6	4.6	130	100.0
Self-expression competences	16	12.3	70	53.8	34	26.2	10	7.7	130	100.0
Social competences	15	11.5	55	42.3	48	36.9	12	9.2	130	100.0
Cultural competences	22	16.9	67	51.5	19	14.6	22	16.9	130	100.0

Table 3: Numbers (f) and structural percentages (f%) of the parents' answers to the question: "Which competences do you think the usage of ICT most develops?"

The table shows that parents are quite unified in their opinions about the development of a child's competences by using ICT. In all examples, approximately one half of parents believe that ICT partially develops child's competences. In their opinion, ICT develops: motor competences (53.8%), learning competences (58.5%), language competences (49.2%), self-expression competences (53.8%), social competences (42.3%) and cultural competences (51.5%).

A more detailed analysis of the results has shown that parents with a higher level of education believe that the usage of ICT increasingly develops certain child competences (learning competences, language competences, self-expression competences and social competences). This fact is not surprising; because we can assume that parents with a higher level of education are more ICT-competent and that they are using ICT for their own purposes. This means that beliefs of parents with a higher level of education about a child's usage of ICT are more positively oriented than the opinions of parents with a lower level of education.

3.4. The child's attitude towards ICT at home

Just like everybody else, children also have an attitude towards ICT that is difficult to determine, because children do not yet know how to best express their feelings about ICT (what they like and what they do not) (Plowman & Stephen, 2002).

Attitude	f	f%
Child is overly interested in ICT and he/she uses it too much	12	9.2
Child is interested in ICT and he/she likes to use it	114	87.7
Child is not interested in ICT and he/she does not like to use it	4	3.1
Total	130	100.0

Table 4: Numbers (f) and structural percentages (f%) of parents' answers to the question: "What type of relationship does your child have with ICT at home?"

The table shows that the majority of parents (87.7%) believe that their child is interested in ICT and that he or she likes to use it. Parents denote this attitude positively and also approve of it, as long as it is regulated. A lot less parents (9.2%) believe that their child is overly interested in ICT and that he or she uses it too much. Few parents (3.1%) believe that their child is not interested in ICT at all and that he or she does not use it yet. Parents also feel that this is not bad, and they do not encourage the child to use ICT, because they think that it is not the right time to use ICT yet.

4. Discussion

Four-year-old children often encounter ICT in their homes. The majority of them live in families that own a TV, a mobile phone, a computer, a CD or a DVD player, a digital camera and a printer. A lot of families also own other ICT devices (MP3 players, iPods, digital video-cameras, gaming consoles...) that are not so common, so children encounter them rarely. Most families own ICT devices that are designed especially for children. These are programmable toys (talking dolls and robots) and simulating toys (child computer, phone, kitchen appliances...).

Research has also shown that, in general, families with girls more often own various types of ICT than families with boys. This fact is quite surprising, because we would expect the opposite. So far, a lot of studies have indicated that boys prefer to take part in ICT activities than girls, which could consequently mean that families with boys own more various types of ICT devices (McPake, Stephen, Sime & Downey, 2005). We also found that parents with a lower level of education more often own a personal computer than parents with a higher level of education. This is very surpris-

ing, because we would expect the opposite. We could assume that a higher level of education provides parents with a higher salary level and thus easier purchasing of a computer. A higher level of education can also be connected to the fact that those parents use their computers for work purposes more often than parents with a lower level of education. This is not always the case, because almost every family now owns at least one or more computers.

Children like to use technology, because it is entertaining. Some children at this age already develop permanent interests in certain types of play, and this is reflected in the technology they use. At the age of four, according to Piaget, a child is already capable of symbolic thought (Birch, 1997). This means that the child can use mental pictures, words and movements as symbols for denoting something else (Marjanovič, Umek & Zupančič, 2004). We have to emphasise here that children probably still comprehend and use ICT as a toy and not as a device (Fekonja, Umek & Zupančič, 2006). We were interested in how children use ICT at home. Do children use ICT alone, do they need help and do they not use certain types of ICT at all? Children use the TV, and of course ICT toys, quite independently. ICT toys are designed especially for them, and because of that their usage is simple and safe. On the other hand, children need help when using a computer and various other players. We were glad to see that many children almost never use other ICT devices that they come across at home, and that their usage is limited only to basic and simple forms of ICT. Children usually use the ICT that is always available to them, and their usage is simple and independent. Here, we have to emphasise that children do not actually use ICT but rather play with it, because its true purpose is not well-known to them yet. A more detailed revision of the results has shown that girls use ICT more independently than boys, which is surprising, because McPake et al. (2005) have shown that boys prefer to take part in activities involving ICT. In addition, Nikolopoulou et al. (2010) suggest that boys use ICT more independently than girls because family values demand that from them (for boys, self-dependence, independence and taking initiative are seen as the first steps towards adulthood and taking a leading role in the family). This is a more traditional view of the family that is being gradually replaced by the modern concept of gender equality in the family.

Plowman, McPake & Stephen (2008) have also proved that the usage of ICT best develops learning competences, because learning with ICT is in itself a natural process, evolving independently and not self-consciously. This learning happens in the child's home (informal) environment, where it is the result of cooperation in a socially situated practice. Nevertheless, learning how to use ICT is not intentional (children see usage of ICT as a part of play); children can develop a broad spectrum of learning techniques but only by interacting with ICT. On the other hand, we can assume that parents' belief that ICT least develops a child's social competences is conditioned by their systems of cultural beliefs, which often originate from general public opinion. Our society is still greatly influenced by the mentality that ICT harms the child and that the child does not benefit from it (Plowman, McPake & Stephen, 2008). This is also seen in parents' beliefs. In general, they state that the usage of ICT offers the child the possibility of gaining new knowledge and learning. But they still think that ICT distracts the child from interacting with family members, peers and society in general. The results of the study have also shown that a lot of parents do not know if the usage of ICT develops the child's cultural competences, which include mostly understanding the various roles of ICT in society and the possibilities of its usage for various social and cultural purposes (communication, work, manner of expression and entertainment).

A lot of children have a healthy relationship towards ICT. At this age, they are already interested in ICT and like to use it. It is important that parents see this relationship in a special way, because the child does not perceive the majority of ICT the same way as we do. For the child, ICT is still a toy and a source of entertainment. Stephen et al. (2008) showed that by the age of four children are sophisticated users of ICT who assess their own accomplishments, know what they like and distinguish between their own operative competences and the possibility of taking part in ICT activities. This cognition can also be applied in our case, and we can conclude that children are, to some extent, aware of the concept of ICT, its employability and the role that it has in the family.

Roberts, Foehr, Rideout & Brodie (1999) found that most children use ICT between one to three hours per day. This usage often takes place without parents knowing it, because children have unlimited access to their own personal media. At the age of four, a child is already in potential

danger if usage of ICT is not properly regulated. That is why parents have to supervise its usage consistently. It is necessary to achieve a balance between all of a child's activities, introduce time limitations and equally distribute the child's play between outdoor and indoor activities and individual and group games. Experts have raised great differences in opinion regarding the question of how often and how much children should use ICT. Some of them believe that usage of ICT harms the child, while others see only positive effects from it. That is why we asked parents how often their children use certain types of ICT at home. Parents have stated that children use the TV every day, while all other ICT is used rarely or never. Of course, the majority of children use ICT toys several times a week.

5. Conclusions

In accordance with the results, we can conclude that the majority of four-year-old children live in a technological environment, enriched with media, where the family supports learning through ICT. We also support this assertion with the fact that nowadays there are few families that do not own the majority of basic ICT devices (TV, mobile phone, computer, digital camera...), since technology has become a part of our everyday way of life and because without its constant presence it would be very hard to live.

A four-year-old child is curious, and because of that there is a possibility that he or she will want to use ICT more and more often and for longer periods of time. We have found that this (increased) desire to use ICT is influenced by parents' (or other family members') constant usage of ICT. These results coincide with the results of another study, that shows that a child's (increased) desire to use ICT is most influenced by family habits (family values and expectations), which affect the relationship between the usage of traditional toys and ICT. Even though the child's (increased) desire to use ICT is influenced by all family members, the parents still play the most important role, because they are closest to the child, spend the most time with him/her and provide help and support when needed.

Parents believe that usage of ICT develops a child's motor competences, learning competences, language competences, self-expression competences, social competences and cultural competences. Usage of ICT with a young child could already have positive consequences, but excessive usage could also cause negative consequences. Experts believe that proper usage of ICT cannot have negative effects (Technology and young children – ages 3 through 8, 1996). When we asked parents what they think about such ICT usage, the majority of them stated that such usage could have negative and positive consequences at the same time. As negative consequences, parents mention contact with violent or inappropriate content, threats to physical health (deterioration of sight, stiffness, spinal damage due to sitting position, obesity...), associability, loss of contact with reality and even addiction. As positive consequences, parents mention the acquisition of new knowledge and skills and understanding ICT, which will serve the child in his or her future schooling and employment. All parents agree that ICT has to be chosen properly and the manner and time of usage controlled. Parents should be aware of the broad selection of ICT intended for children and know how to buy products suitable for their four-year-old children and their stage of development (Aubry & Dahl, 2008). In addition, the child should be given help and explanations regarding the concept of ICT in order to use ICT correctly in the future.

It is encouraging that all parents are acquainted with the child's usage of ICT, because only a few parents expressed a desire for additional information: mostly about the child's usage of ICT in the kindergarten, about the influences of ICT on a child's development and about the proper way of introducing ICT to a child. We would also like to point out the importance of mutual informing and cooperation of parents, educators, kindergarten administrations and other involved individuals who are in contact with the child. Only in this way can parents teach their children to use ICT correctly, supervise the usage and prevent possible negative consequences of its usage.

Everything in life has its good and bad sides. It is the same with the question regarding the appropriateness of using ICT among preschool children, especially the youngest ones. The ever-increasing presence of ICT in everyday life has forced parents, educators and child proponents to question its relationship with the cognitive, social and developmental needs of preschool children. The debate soon created division between those who believe that the usage of ICT is pernicious for the child's health and learning and those who think that using ICT contributes to the child's so-

cial and intellectual development in an important way. Our research has shown that four-year-old children already have contact with basic types of ICT at home and that they also gladly use it, but their usage is not yet controlled and definitely does not have any negative consequences.

Parents have expressed that they are happy with their children's ways of using ICT, although some of them doubt its educational value, especially at such a young age. That is why we emphasise once more the importance of cooperation between parents, educators, kindergarten administrations and other involved individuals. They should share information about the child's usage of ICT and its influences on the child as well as about all other positive or negative effects on the child's development. Only through everyone's cooperation can the child begin to learn, develop important competences for further schooling and become an active member of today's modern e-society.

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