Received: 23-05-2012 / Reviewed: 27-06-2012
Accepted: 24-09-2012 / Published: 01-03-2013

DOI: http://dx.doi.org/10.3916/C40-2013-03-02

● Jurka Lepičnik and Pija Samec
Maribor (Slovenia)

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

Uso de tecnologías en el entorno familiar en niños de cuatro años de Eslovenia

ABSTRACT

Nowadays, we cannot ignore the fact that young children are over flooded with technologies. Only a proper action and a positive attitude from adults can prevent potential negative consequences, and prepares the child for a life where the usage of communication technologies (ICTs) is necessary for an individual's social success. This article represents the child's access to information-communication technology, its usage at home, the influence of child's ICTs usage on his or hers development of competences, and the child's relation with the ICTs at home. The data was 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 ICTs at home. We found out that four-year-old children in their home environment regularly encounter ICTs. Besides that, we were also interested whether there exist differences according to the child's gender and the parents' level of education. Moreover, we present parents' opinions at 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, ICTs, literacy, digital competence, early development.
Tecnologías de la comunicación, preescolar, hogar, competencias, TIC, alfabetización, competencia digital, desarrollo temprano.

◆ Dr. Jurka Lepičnik-Vodopivec is Associate Professor at the Faculty of Education at the University of Primorska (Slovenia) (jurka.lepicnik@epf.upr.si).

◆ Pija Samec is Professor of Pedagogy and Translator of English (pija.samec@gmail.com).

1. Introduction

Information-communication technology (ICTs) 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 ICTs 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 ICTs is becoming a widespread phenomenon, experts find it irresistible to study. Several studies explore the influence that ICTs has on the child in the kindergarten, but none of them deals with the child's usage at home. When we started studying the child's home usage of ICTs, we used a wider concept of ICTs, 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 Nikolopoulu, 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 ICTs. 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 ICTs the child's family owns, the nature of the child's access at home (limited or unlimited), how the child uses ICTs at home (independently, needs help, does not use at all), how often the child uses at home, the influences on the child's usage of ICTs at home, the influence of the child's usage on his or her development, the child's attitude towards ICTs at home, and the parents' awareness about ICTs 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, its usage and the relation that the child has towards ICTs 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 $\chi 2$ – 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 ICTs in the home environment of four-year-old children

As mentioned before, the broader definition of ICTs 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.

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 ICTs intended especially for children. A total of 102 (78.5%) families own programmable toys (remote-controlled cars, robots, tal-

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 ICTs does your family own?»

king dolls…), and even more (80.8%) own simulation toys (children computers, cash-registers, irons…).

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

The child's access to ICTs 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, ICTs 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 ICTs.

The results for the child's access to ICTs 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 ICTs 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' ICTs 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 ICTs. 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 ICTs device...), most parents state that the major reason for restricting the access to ICTs is their fear that the device will be harmful for the child. Parents fear that the usage of ICTs will harm their child.

Because a lot of children need help using ICTs, 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 ICTs has educational value (Rideout, Vandewater & Wartella, 2003). Kirkorian, Wartella and Anderson (2008) consider that parents should not limit the child's interactive experience with ICTs, 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 ICTs 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 ICTs usage

It is difficult to determine when a child should start using ICTs. We chose four years of age, because the majority of studies show that after this particular age a

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.

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 ICTs most develops?».

child's usage of ICTs 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 ICTs (Wartella, Lee & Caplovitz, 2002). Until recently, learning with ICTs was mostly associated with the concept of distant learning, but this is not the case anymore. The concept of learning with ICTs is changing. ICTs is also more and more present in the homes of children, where learning with ICTs happens naturally and enhances the development of important child competences. By using ICTs, 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 ICTs competences: technological, cultural and learning.

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

The table shows that parents are quite unified in their opinions about the development of a child's competences by using ICTs. In all examples, approximately one half of parents believe that ICTs partially develops child's competences. In their opinion, ICTs 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 ICTs 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 ICTs for their own purposes. This means that beliefs of parents with a higher level of education about a child's usage of ICTs are more positively oriented than the opinions of parents with a lower level of education.

3.4. The child's attitude towards ICTs at home

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

The table shows that the majority of parents (87.7%) believe that their child is interested in ICTs 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 ICTs and that he or she uses it too much. Few parents (3.1%) believe that their child is not interested in ICTs 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 ICTs, because they think that it is not the right time to use ICTs yet.

4. Discussion

Four-year-old children often encounter ICTs 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 ICTs devices (MP3 players, iPods, digital video-cameras, gaming consoles…) that are not so common, so children encounter them rarely. Most families own ICTs devices that are designed especially for children. These are programma-

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 ICTs at home?».

ble 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 ICTs 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 ICTs activities than girls, which could consequently mean that families with boys own more various types of ICTs 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 surprising, 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 ICTs as a toy and not as a device (Fekonja, Umek & Zupančič, 2006). We were interested in how children use ICTs at home. Do children use ICTs alone, do they need help and do they not use certain types of ICTs at all? Children use the TV, and of course ICTs toys, quite independently. ICTs 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 ICTs devices that they come across at home, and that their usage is limited only to basic and simple forms of ICTs. Children usually use the ICTs that is always available to them, and their usage is simple and independent. Here, we have to emphasise that children do not actually use ICTs 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 ICTs more independently than boys, which is surprising, because McPake et al. (2005) have shown that boys prefer to take part in activities involving ICTs. In addition, Nikolopoulu et al. (2010) suggest that boys use ICTs 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 ICTs best develops learning competences, because learning with ICTs 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 ICTs is not intentional (children see usage as a part of play); children can develop a broad spectrum of learning techniques but only by interacting with ICTs. On the other hand, we can assume that parents' belief that ICTs 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 ICTs 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 ICTs offers the child the possibility of gaining new knowledge and learning. But they still think that ICTs 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 ICTs develops the child's cultural competences, which include mostly understanding the various roles of ICTs 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 ICTs. At this age, they are already interested in ICTs 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 ICTs the same way as we do. For the child, ICTs 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 ICTs who asses their own accomplishments, know what they like and distinguish between their own operative competences and the possibility of taking part in ICTs 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 ICTs, its employability and the role that it has in the family.

Roberts, Foehr, Rideout & Brodie (1999) found that most children use ICTs 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 ICTs 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 ICTs. Some of them believe that usage of ICTs 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 ICTs at home. Parents have stated that children use the TV every day, while all other ICTs are used rarely or never. Of course, the majority of children use ICTs toys several times a week.

The results of the study have also shown that a lot of parents do not know if the usage of ICTs develops the child's cultural competences, which include mostly understanding the various roles of ICTs in society and the possibilities of its usage for various social and cultural purposes (communication, work, manner of expression and entertainment).

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 ICTs. We also support this assertion with the fact that nowadays there are few families that do not own the majority of basic ICTs 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 ICTs more and more often and for longer periods of time. We have found that this (increased) desire to use ICTs is influenced by parents' (or other family members') constant usage of ICTs. These results coincide with the results of another study, that shows that a child's (increased) desire to use ICTs is most influenced by family habits (family values and expectations), which affect the relationship between the usage of traditional toys and ICTs. Even though the child's (increased) desire to use ICTs is influenced by all family members, 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 ICTs develops a child's motor competences, learning competences, language competences, self-expression competences, social competences and cultural competences. Usage of ICTs with a young child could already have positive consequences, but excessive usage could also cause negative consequences. Experts believe that proper usage of ICTs cannot have negative effects (Technology and young children – ages 3 through 8, 1996). When we asked parents what they think about such ICTs 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 ICTs, which will serve the child in his or her future schooling and employment. All parents agree that ICTs has to be chosen properly and the manner and time of usage controlled. Parents should be aware of the broad selection of ICTs 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 addi-

tion, the child should be given help and explanations regarding the concept of ICTs in order to use ICTs correctly in the future.

It is encouraging that all parents are acquainted with the child's usage of ICTs, because only a few parents expressed a desire for additional information: mostly about the child's usage of ICTs in the kindergarten, about the influences of ICTs on a child's development and about the proper way of introducing ICTs 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 ICTs 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 ICTs among preschool children, especially the youngest ones. The ever-increasing presence of ICTs 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 ICTs is pernicious for the child's health and learning and those who think that using ICTs contributes to the child's social and intellectual development in an important way. Our research has shown that four-year-old children already have contact with basic types of ICTs 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 ICTs, although some of them doubt its educational value, especially at such a young age. That is way 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 ICTs 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.

References

Aubrey, C. & Dahl, S. (2008). *A Review of the Evidence on the Use of ICTs in the Early Years Fundation Stage.* (www.e-learningcentre.co.uk/Resource/CMS/Assets/5c10130e-6a9f-102c-a0be-003005bbceb4/form_uploads/review_early_years_foundation.pdf) (06-01-2011).

Birch, A. (1997). *Developmental Psychology: From Infancy to Childhood*. London: McMillian Press LTD.

European Commission (Ed.) (2001). *Making a European Area of Lifelong Learning a Reality.* (www.bologna-berlin2003.de/pdf/MitteilungEng.pdf) (22-04-2011).

Fekonja, U. (2006). Igrače. In L. Marjanovič Umek & M. Zupančič (Eds.), *Psihologija otroške igre: od rojstva do vstopa v šolo* (pp. 99-124). Ljubljana: Universidad de Ljubljana, Facultad de Artes.

Hoffman, D.L. & Novak, T.P. (1996). Marketing in Hypermedia Computer-mediated Environments: Conceptual Foundatuions. *Journal of Marketing, 60,* 50-68. JSTOR (15-04-2010).

Kirkorian, H.L., Wartella, E.A. & Anderson, D.R. (2008). Media and Young Children's Learning. *Future of Children*, *18*, 39-61. ERIC (05-11-2010).

Markovac, V. & Rogulja, N. (2009). *Key ICTs Competences of Kindergarten Teachers*. In 8th Special Focus Symposium on ICESKS: Information, Communication and Economic Sciences in the Knowledge Society (str. 72-77). Zadar: The Faculty of Teacher Education, University of Zagreb and ENCSI.

Marjanovič Umek, L. & Zupančič, M. (2004). *Razvojna Psihologija*. Ljubljana: Scientific and Research Institute of Faculty of Arts.

McPake, J., Stephen, C., Plowman, L., Sime, D. & Downey, S. (2005), *Already at a Disadvantage? ICTs in the Home and Children's Preparation for Primary School. University of Stirling.* (www.ioe.stir.ac.uk/research/projects/interplay/docs/already_at_a_disadvantage.pdf) (30-10-2010).

McPake, J., Stephen & Plowman, L. (2007). *Entering e-society. Young Children's Development of e-literacy*. University of Stirling (www.ioe.stir.ac.uk/research/projects/esociety/documents/Entering e-SocietyreportJune2007.pdf) (06-12-2010).

Nikolopoulu, K., Gialamas, V. & Batstouta, M. (2010). *Young Children's Access to and Use of ICT at Home.* University of Patras. (www.ecedu.upatras.gr/review/papers/4_1/4_1_25_40.pdf) (06-10-2010).

Plowman, L. & Stephen, C. (2002). *A «benign addition»? Research on ICTs and Preschool Children.* University of Stirling (https://dspace.stir.ac.uk/bitstream/1893/459/1/Plowman%20JCAL.pdf) (21-11-2011).

Plowman, L., McPake, J. & Stephen, C. (2008). Just Picking it up? Young Children Learning with Technology at Home. *Cambridge Journal of Education*, *38*, 303-319. ERIC (30-10-2010).

Plowman, L., McPake, J. & Stephen, C. (2010). The Technologisation of Childhood? Young Children and Technology in the home. *Children and Society, 24*. (http://onlinelibrary.wiley.com/doi/10.1111/j.1099-0860.2008.00180.x/full) (30-10-2010).

Punie, Y. (2007). Learning Spaces: an ICT-enabled Model of Future Learning in the Knowledge-based Society. *European Journal of Education*, *42*. (http://onlinelibrary.wiley.com/doi/10.1111/j.1465-3435.2007.00302.x/full) (30-10-2010).

Rideout, V.J., Vandewater, A.E. & Wartella, A.E. (2003). *Zero to Six: Electronic Media in the Lives of Infants, Toddlers and Preeschoolers.* (www.kff.org/entmedia/upload/Zero-to-Six-Electronic-Media-in-the-Lives-of-Infants-Toddlers-and-Preschoolers-PDF.pdf) (30-10-2010).

Roberts, D.F., Foehr, U.G., Rideout, V.J. & Brodie, M. (1999). *Kids and Media @ the New Millenium*. (www.kff.org/entmedia/upload/Kids-Media-The-New-Millennium-Report.pdf) (06-01-2011).

Stephen, C., McPake, J., Plowman, L. & Berch-Heyman, S. (2008). Learning from the Children: Exploring Preschool Children's encounters with ICTs at Home. *Journal of Early Childhood Re-*

search, 6 (2), 99-117.

TECHNOLOGY AND YOUNG CHILDREN – AGES 3 THROUGHT 8 (Ed.) (1996). (www.kqed.org/assets/pdf/education/earlylearning/media-symposium/technology-children-naeyc.pdf?trackurl=true) (22-12-2012).

WARTELLA, E.A., LEE, J.H. & CAPLOVITZ, A.G. (2002). *Children and Interactive Media*. (http://74.125.155.132/scholar?q=cache:-FGj8L4ExmDAJ:scholar.google.com/+children+and+interactive+media&hl=sl&as_sdt=0&as_vis=1) (06-01-2011).