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## **COMPUTER GAMES, PREESCHOOLERS, PARENTS AND PRESCHOOL TEACHERS' EXPERIENCE**

### ***Summary***

*Along with the development of technology, interactive video and computer games, based on a digital computer technology, have also been included into the children's playing repertoire and become part of the contemporary children's culture. More and more children, including preschoolers, spend time playing computer and video games, which designers and computer game industries offer under the pretext of developmental and educational values, giving rise to a considerable controversy. Children's early involvement in the world of computer and video games has been reasoned by the contemporary imperative to acquire media and computer literacy.*

*In everyday work, questionnaires have been designed to analyse adults, parents and preschool teachers' attitudes toward computer games and children's game-playing practice, as well as educational values and developmental potentials of such games. This has given a significant insight into their application to an adult educational practice. Moreover, preschoolers' interviews question their perception of computer games and game practice.*

*The authors find it extremely important to gain insight into the child's perception of media, computer and game-playing environment, as well as the status of such contemporary games in the system of values and educational practice performed by adults, parents and teachers.*

Nowdays a child is being introduced to a modern information-communication technology by getting his first-hand experience in computer usage within a family, institutional or nursery environment. Computer, its sound, graphics and animation, irresistably attracts and draws child's attention. Hierwith, a child, simply by observing adults and other children working on a computer, also wants to give it a try. Children nowadays see computer as a part of an everyday environment, so that from an early childhood onwards, and encouraged by cusiosity and parents' influence, they have been broadening their interest and fearless usage. Numerous parents and educators keep encouraging child's interest in computers, by stressing it as necessity to gain computer competence, which seems an inevitable element of fitting into a modern technological society (Shields, Behrman, 2000). Even national policies have been maintaining a child's early computer literacy development, which has gradually become a competence required by many professions and a part of a contemporary man's everyday life. Childhood nowadays is being computerized, just as computers have started to assume roles such as those of a babysitter, an educator and a child's playmate. However, technology cannot replace human interaction, activities such as story-telling, live discussions, game with real playmates, nor competent teacher's instruction.

The influence of the computer on a child's cognitive and socio-emotional development cannot be denied. However, what is the nature of this influence? Research results have been contradictory. Some have pointed out motivational and development values of computers,

while others potentially dangerous elements on the child's development, such as social isolation, passivity, addiction problem and influence on aggressive behaviour (Harris, 2001, Haugland, 2005, Squire, 2002, Young, Young, 1997).

According to the National Association for the Education of Young Children [NAEYC], computers contribute to child's intrinsic motivation, encourage social and cognitive development and self-conceptualization, develop positive attitude towards learning. Clements, according to Lynch, Warner, 2004, claims that computer technology can encourage child's thinking, learning and social interaction. NAEYC has defined developmentally appropriate computer usage in kindergartens. In its statement, „Technology and Young Children – Ages 3 through 8,“ NAEYC (1996), it has stressed teachers' obligation to establish and ensure technology which would be culturally, individually and age level appropriate to a child. NAEYC has also suggested information – communication technology integration into the learning environment as one of many options to support child's social and cognitive development.

Computer industry has been designing different softwares intended for playing, teaching and learning, and promoting their development and educational values by stressing the imperative of gaining computer and information literacy from the early age onwards. In order to reach young viewers, software designers have made an effort to present the content in an attractive way. Well designed computer software, especially computer games, enriched by visual and verbal support, merge of pictures, sounds and various information, can draw and keep child's attention for a longer period of time, as well as broaden child's playing theme. Children enthusiastically accept computer possibilities for playing and recreation, problem solving and learning, claim Verenikina, Harris, Lysaght, (2003) and VanScoter, Ellis; Railsback, (2001). In such a way computer games<sup>1</sup> have been entering the contemporary children's playing repertoire and becoming a part of their playing culture. The children of today can be called „A computer game generation“, claims Squire (2002). Every day they spend more and more time in front of the computer screens. A national study from USA (Lewin, 2001) reveals data, according to which children between the ages of two and five spend on average 27 minutes a day on computer, children between six and eleven 49 minutes a day, and between twelve and seventeen 63 minutes a day. Children have been exposed to computers early and the opinions on the appropriate age for it are divided. Haugland (2005) points out the research, according to which, the children between the ages of 3 and 4 are capable of using computer with adult's support and supervision. Cordes and Miller (2000), put forward claims by the international group of physicians, scientists and researchers, who have demanded a moratorium on computer use in kindergartens and lower grades of primary school, believing that in such an early age it can interfere with child's healthy physical and mental development. Hochmann, according to Lynch and Warner (2004), does not recommend computer use to the children under 3. Katz, according to Squire (2002), stresses the fact that a child used to „digital game-based learning“ stops reacting to a traditional instruction. Provenzo, according to Squire, (2002), warns about the possibility of a child becoming hyper-competitive.

Clements (1995) points out stronger points in favour of computer use in an early age. Computer, claims the above mentioned author, can serve as a tool in improving child's learning through exploration, creative problem solving and „self-guided instruction“.

Lynch and Warner (2004) point out discussions among preschool educators over the key questions dwelled on: Does the computer turn a child into a passive student? Do younger children have difficulties in manipulating the computer? What are the development effects of an early computer usage? The above mentioned discussion, opened 25 years ago, has still being dividing experts and confronting different attitudes.

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<sup>1</sup> Harris (2001) defines computer games as the games played on personal computers, unlike video games which are played on the video arcade.

Harris (2001) stresses the lack of naturalist studies on the nature of „computer game-playing experiences“. We have been facing relatively few research papers on subjective experience and perception of computer use among children of different age groups. What has been lacking is an insight into child's inner experience of the cyberspace. Equally there have been insufficient research on computer game values as a game *per se*, warn Young and Young (1997) and Ryokai, Cassell, (2003).

Harris (2001) warns about most research papers based on computer games and their influence on child development and behaviour, which have been merely reduced to short-term effects, and therefore puts forward the need for a longitudinal research on the long-term effects of computer games. He also warns about the previous research findings, according to which computer games have both positive and negative influence on a child development. Negative outcomes of an early computer game exposure are aggression, addiction, social isolation, misinterpreted image of oneself, while the positive ones are relaxation, growing self-confidence, better socializing effect, development of cognitive abilities.

Haugland (1992, 1999, ) warns about effective computer use in an early education, which requires teacher's competence including knowledges and skills of how to integrate computer into the curriculum. Epstein, according to Haugland, 2005, identifies key components of teacher training with a purpose of gaining the above mentioned competences: practical experience, workshops, models and mentors, and high quality experts' supervision. Competent teacher will be able to estimate whether the software used in working with children is appropriate for their age. In the position statement of the „Technology and Young Children – Ages 3 through 8“, NAEYC (1996), teachers' role and responsibility is as follows: evaluation of the appropriateness of the software used among three-year-olds, appropriate computer technology application, evaluation of development and educational effects, enabling computer access even to the children with no such opportunity, teacher-parent cooperation and parent education, computer prejudice and stereotype elimination. Appropriate teacher competence guarantees making some good choices about the use of information and communication technology in an educational practice, choices which result in valuable development outcomes. The teacher evaluates and chooses a computer software according to his/her awareness of child development, nature of child's learning process, as well as good teaching principles, just as this would be the case in using any other didactic tool. While using it, teacher observes children's reactions, allowing them to use computer on their own pace and offers children encouraging support. Observing a child while using computer and playing computer games can serve the teacher as „a window“ to child's thoughts, child's learning style and child's social competence (Ivanoff-Levine, Orleans, 2000, Owen, 2004).

The research have shown that preschoolers prefer using computer in a mutual activity with other peers or adults. Social context of computer use and game playing puts the child into the situation where he communicates with a computer game, but also with an actual playmate, whereby an interaction takes place in a completely new way, different from other traditional and social contexts. A child learns about reciprocity and cooperation, taking turn while game playing and putting immediate wish fulfillment aside, which builds child's social competence. Teacher's educational practice is always defined by his/her value system, that is, teacher's implicit pedagogy. Therefore, teachers should overcome a prejudice of perceiving computer as a substitute for child's live experiences with different materials, as a substitute for adult and peer interaction. Computer game should not substitute, nor replace children's actual game, mobile, constructive, dramatic and symbolic. The teacher should also work on overcoming his/her possible personal resistance to computer use and computer games, by getting some experience playing on his/her own. The teacher should equally be capable of choosing and using those computer games which encourage different interests in a child, conforming with

their differences and individuality and promoting positive social values. The teacher should also bear in mind that playing computer games similarly affects both boys and girls<sup>2</sup>.

It is mandatory for the institutions for teachers' professional education to include modern information and communication technology contents into their programmes, as well as methodology of their use on the level of knowledges and skills in the actual educational practice. In this way teachers can also gain and develop their own computer and information competence, along with the sense of personal efficiency, assurance and self-confidence while using it. (Babić, Irović, 2000, 2003). Efficiency of the educational application of computer games would become better with teachers' better insight into a child's experience of computer games, as well as teachers' ability to decentralize by putting themselves into „the child's shoes“, realizing peculiarities of the child perspective.

We were interested to find out about the practical use of computers and computer games throughout Croatian kindergartens. For this purpose we have conducted a research through kindergartens of the town of Osijek.

## **Research methodology**

### ***Research aims***

Research has been conducted in order to gain insight into the children's perception of computer games as well as their game practice. It has also aimed at gaining insight into the adults' attitudes (teachers and parents) towards the development and educational values of computer games and adult educational practice.

### ***Methods of data collecting***

Due to the research requirements, questionnaire has been designed for both parents and preschool teachers, along with an interview procedure for children, kindergarten attendants.

### ***Interviewees***

An interview has been conducted among 30 children (15 boys and 15 girls), kindergarten attendants, averaging chronologically about 6 years and 3 month of age.

30 preschool teachers have been interviewed, 70,00% of whom are two-year and 30,00% three-year-graduates from the Teacher Training College. Teachers' average working experience is 19,5 years (ranging from 1,5 to 35 years).

30 parents have also participated in an interview (20 mothers and 10 fathers), majority of whom are high school (53,33%) and college graduates (33,33%).

## **Research results**

### ***Interview with children***

An interview started with a demand upon children to define game as a term. Most of them defined it by *describing a specific game activity* (56,66%), or as *spending time with friends* (33,33%), while the others thought it was *an activity that brings pleasure*.

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<sup>2</sup> In the document by NAEYC Technology and Young Children – Ages 3 through 8 A position statement of the National Association for the Education of Young Children, research results have been pointed out, according to which girls have been using computer less than boys, in both family and kindergarten/school environment. The results have also warned about the educational institution which should be used to eliminate „digital classification“ into those who have, and those who do not have access to the computer or the Internet in the family.

We were also interested to find out which of the computer games do the children play at home and which in kindergarten.

At home mostly played are fun and action computer games (63,63% of the children), equally followed by logical and social games. In kindergarten, little less in percentage, but similarly rising to the top priority, we can find fun and action games (45,94%).

According to children's statements concerning the choice of the computer games played at home, majority of them claim that the decision is left up to them (53,33%), followed by father's involvement (20,00%), mother's (6,66%) and/or brother's/sister's (6,66%) or nobody's (6,66%). The rest of the children (6,66%) do not play computer games at home.

In the situation when they do play computer games at home, their most frequent playmate is brother/sister (33,33%), neighbourhood friend (26,66%), mother (6,66%), grandfather/grandmother (3,33%). 20,00% of the children claim to play computer games at home on their own, 6,66% with a dog (?) and 3,33% with an unnamed playmate. When in kindergarten, all the children play computer games with the children from their own aging group.

To the question of when they play computer games at home, 40,00% of the children said – *whenever I want to*, 23,33% - *when mom/dad gives permission*, and 13,33% - *when computer is available*.

How long do the children play computer games, at home and in kindergarten?

At home 26,66% of the children play *as long as they want to*, 20,00% *until they get tired*, and 10,00% *until mom/dad says it is enough*, 6,66% *until the game is over*, and the rest of the children stated game playing time limit (from 3 minutes to half an hour). 3,33% of the children do not play computer games at home. The rest of the children play until the game is over, until the time comes to put the toys away, until they lose in a game or simply get bored.

What do the children like most about computer games?

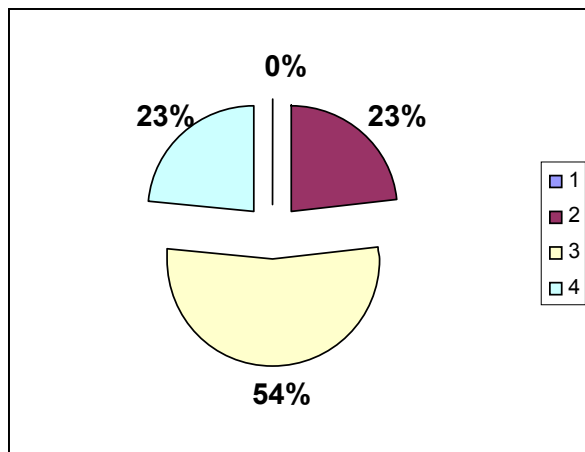
26,66% of the children claim that it is the content of a game, 26,66% that these are the aggressive elements of the game (fighting, shooting, killing ...), 13,33% that it is the sense of accomplishment. 13,33% of the children are drawn to the technical elements of the game (mouse clicking, picture animation ...), 10,00% are drawn to the characters in the game, and 6,66% to the virtual reality where „everything is possible“. 3,33% of the children claim that they cannot explain the attractiveness of a computer game.

60,00% of the children see also unattractive elements in the game.

For 50,00% of the children it is the specific game content which does not please their taste, for 18,75% these are technical difficulties („freezing“, troublesome „saving“ ...), and for 18,75% these are aggressive moments of the game (fight, darkness, war ...). 12,50% of the children do not like how some game levels or the whole game ends.

In most cases (46,66%) the reason for computer game attractiveness lies in amusement. Children also describe computer games as *nice, cool, favourite, interesting ...*

Pie chart 1: *Children's preferences according to game types: play with building blocks, play with a doll, play with a ball and a computer game*



- 1- play with building blocks
- 2- computer game
- 3- game with a ball
- 4- game with a doll

Not one child have chosen a play with building blocks, most of the children have picked a play with a ball and the rest of the children have been equally decisive over a computer game and a game with a doll.

Children were asked to *elaborate on their choice*.

Children have elaborated their choices in the following ways: 60,00% of the children have chosen the game upon the sense of pleasure it contributes, 20,00% upon the dynamics and mobility of the game, 6,66% upon their playmates – peers. 6,66% of the children have stated that the reason of their choice of the specific game lies in the fact that they dislike other games offered.

#### *Questionnaire for preschool teachers*

Teachers introduced computer games into kindergartens in the period between 1997 and 2007. 32,25% of the teachers did this encouraged by their colleagues, 22,58% by their educational workers and 22,58% on their own initiative. The rest did this on parents' initiative (12,90%), children's (9,67%), educational team's (6,45%) and headteacher's (3,22%)

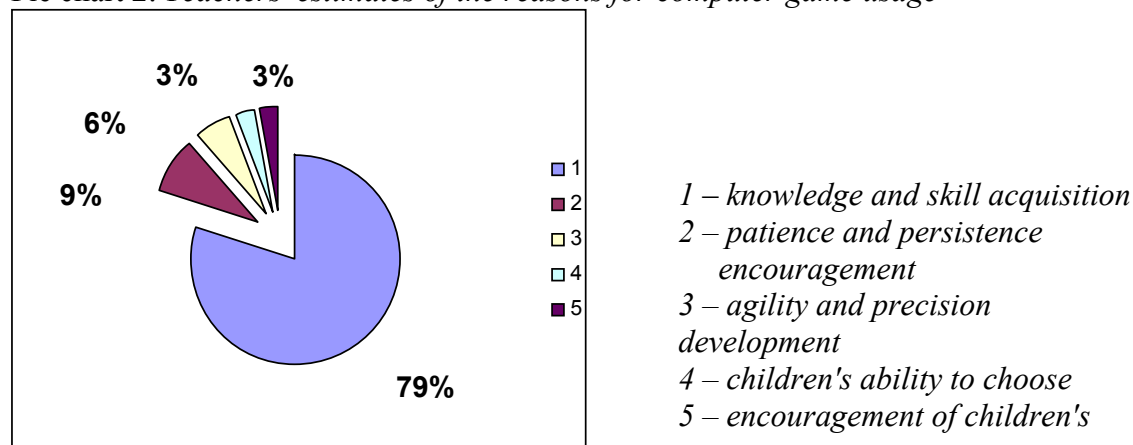
According to teachers' claims, parents accepted (53,33%) and encouraged (46,66%) implementation of computer games.

Teachers have estimated (60,00% of the interviewed) that the children's interest in the computer games in their educational groups has grown over time.

Teachers' opinion on whether the children implement computer game contents into their everyday („typical“) games has been divided, 50% to 50%.

Majority of the interviewed teachers (60,00%) use computer games several times a week, according to plan, 33,33% do it once a week, and 6,66% on a regular basis.

Pie chart 2: Teachers' estimates of the reasons for computer game usage



As the chart shows, computer game usage for the purpose of knowledge and skill acquisition prevales.

We were interested to find out whether teachers themselves have any experience in playing computer games. 26,66% of the teachers never play computer games, 63,33% play sometimes, 6,66% often, and 3,33% do it regularly. Those who play, usually get to choose deductive computer games, logical games or guessing games. (41,95%).

Children attending such teachers' educational groups usually play didactic interactive games such as *Sunčica*, *Garfield*, *Hlapić* (55,05%), then fun and action games such as *Super Mario*, *Soccer*, *Yu-Gi-Oh*, *Asterix*, *Disney*, *Tarzan*, *Aladdin*, *Bob the Sponge*, *Petar Pan* (44,94% of the children).

In order to gain insight into teachers' attitudes toward computer games, we have used proposition scales. Teachers accepted propositions offered, by ranking them on the scale from 1 to 5 (1 – totally unacceptable; 2 – partially acceptable; 3 – both acceptable and unacceptable; 4 – acceptable; 5 – totally acceptable)

Table 1: Teachers' estimates on development value of computer games and their encouragement for cognitive child development

Statement	Computer games develop child's cognitive abilities	Computer games are of no development values
Grade on the scale	%	%
1-totally unacceptable	-	23,33
2-partially acceptable	-	20,00
3-acceptable and unacceptable	10,00	33,33
4-acceptable	63,33	23,33
5-totally acceptable	26,66	-

Table 1 evidently shows that teachers greatly believe in the power of computer games in development of children's cognitive abilities. Still, 23,33% of the teachers accept the claim of development insignificance of computer games, and 33,33% are not sure of their development value, which is contradictory to the previous estimation.

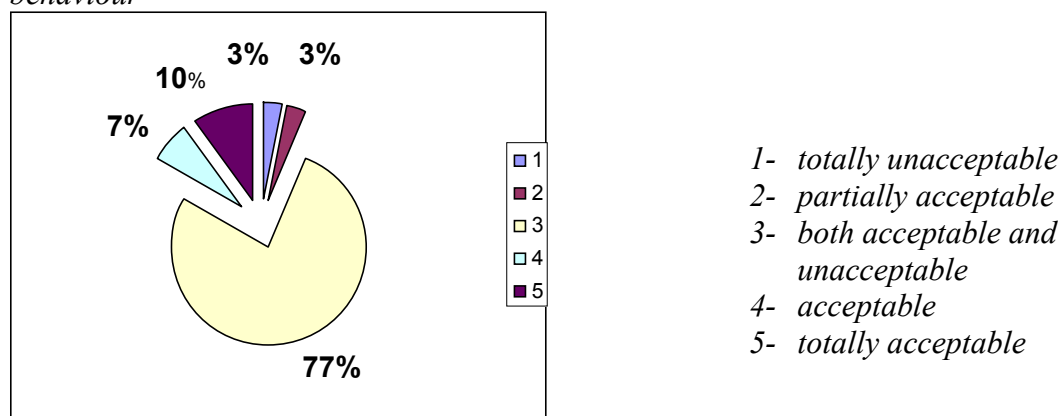
Table 2: Teachers' estimates on encouraging value of computer games for child's imagination and computer literacy

Statements	Computer games encourage child's	Computer games affect child's computer literacy
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	<b>imagination</b>	<b>development</b>
Grade on the scale	%	%
1- totally unacceptable	-	-
2- partially acceptable	6,66	-
3- acceptable and unacceptable	60,00	4,76
4- acceptable	23,33	42,85
5- totally acceptable	10,00	52,38

Teachers' estimates on encouraging value of computer games for child's imagination, as seen in Table 2, are dominantly grouped into *both acceptable and unacceptable* category, only to be grouped into *acceptable* category afterwards. When it comes to development values of child's computer literacy, the statement is mostly acceptable to the teachers, even completely acceptable for 52,38%.

Pie chart 3: *Teachers' estimates on the influence of computer games on child's aggressive behaviour*



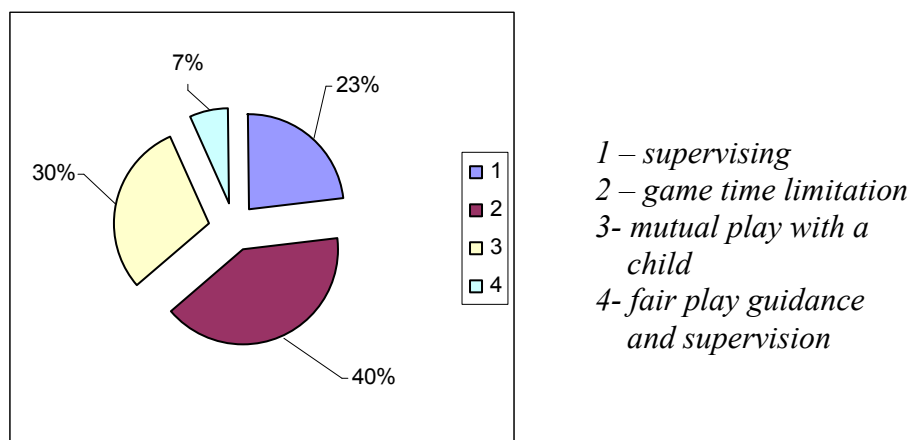
Among the teachers interviewed, the most numerous are those who find the statement on the influence of computer games on child's behaviour acceptable. 10,00% of the teachers completely agree with the statement, that is, find it totally acceptable.

Table 3: *Teachers' estimates on whether computer games develop addiction and competitive spirit and encourage isolation*

<b>Statements</b>	<b>Computer games develop addiction in a child</b>	<b>Computer games encourage competitiveness</b>	<b>Computer games encourage isolation in a child</b>
<i>Grade on a scale</i>	%	%	%
1- totally unacceptable	3,33	3,44	-
2- partially acceptable	-	3,44	6,66
3-acceptable and unacceptable	43,33	27,58	60,00
4- acceptable	20,00	44,82	23,33
5- totally acceptable	33,33	20,68	10,00

More than half of the interviewed teachers estimate that computer games develop addiction among children, and more than 60,00% that they stimulate competition. Concerning the statement on how computer games encourage isolation, most teachers are undecided – 60,00% of the teachers both accept and do not accept. Not one teacher rejects this claim, and 33,33% of the teachers find it acceptable and totally acceptable.

Pie chart 4: Teachers' estimate on the roles that adults take while playing children computer games



Mostly evident are those teachers who the role of an adult in children computer games see primarily as a time limitation game, then mutual game with a child. It is followed by supervision and child guidance towards playing by the rules.

Table 4: Teachers' estimate on the factors concerning quality usage of computer games in the kindergarten

Factors	Teachers' attitudes towards computer games	Computer literacy among teachers	Teachers' knowledge of children and their development	Computer equipment in kindergartens	Cooperation with parents
<i>Grade on a scale</i>	%	%	%	%	%
1-the most important	51,72	48,27	31,03	44,82	24,13
2	31,03	24,13	27,58	24,13	20,68
3	3,44	13,79	31,03	17,24	27,58
4	6,89	13,79	3,44	13,79	13,79
5-the least important	6,89	-	6,89	-	13,79

More than half of the interviewed teachers consider teachers' attitudes as the most important factor in computer usage in kindergarten. 48,27% grade teachers' computer literacy as the most crucial. Divided are teachers' thoughts on the influence of teachers' knowledge in the kindergarten and equally so they estimate the same as *the most important*, but also as *both important and unimportant*. The majority of the teachers estimates computer equipped kindergarten as the most important, while thoughts on the importance of parent-teacher cooperation are still divided.

#### Questionnaire for parents

56,66% of the parents sometimes play computer games, 36,66% never and 6,66% often. Thus some of the parents do not have any personal experience in playing computer games.

The largest number of parents (41,37%) play fun and action games, followed by those who play social games (34,44%), then logical games, deductive and guessing games (20,68%)

and finally those who prefer didactic games (3,44%). According both to the preferences and frequency of computer game playing, game practice of the adults is similar to the teachers'. Interviewed parents confirm that their children play computer games at home: 53,33% sometimes, 30,00% often, 10,00% every day. 6,66% of the parents claim that their children never play computer games.

Even 60,00% of the parents estimate their children to be more skillful at computer games than they are. According to parents' claims, children usually play fun and action games at home (67,39%). This fact is congruous with the children's statements.

Whenever children get to choose between playing with building blocks, on a computer, with a ball or a doll, parents claim that they mostly pick the ball (67,39%), then computer game (26,66%) and a doll (13,33%). Parents' statements confirm the children's.

Parents find their children to be satisfied with the permissive time spent on the computer (63,33%), or sometimes would have played longer than allowed (26,66%). The rest claim that they do not impose a time limit on playing the computer or are simply disinterested. 53,33% of the parents allow their children to play computer games on their own and according to their personal choice, while 33,33% only with permission and under parents' supervision. The rest claim that children themselves could have made the choice, but only afterwards to be approved by the parents as well.

Parents also conclude that when playing computer games at home, child's most frequent playmate is brother/sister (43,33%), or solitary computer game designed for children (43,33%). 13,33% of the children play usually with their father, 13,33% with a friend, and 3,33% with a mother. Therefore, along with an individual play, in a family environment, children mostly take brother/sister as their playmate.

In order to gain insight into parents' attitudes, proposition scale has been applied. Parents, the same way as teachers, have graded the acceptance of the offered statements on the scale from 1 to 5 (1 – totally unacceptable; 2 – partially acceptable; 3 – both acceptable and unacceptable; 4 – acceptable; 5 – totally acceptable).

Table 5: *Parents' estimates on the development values of computer games and their encouragement for a child's cognitive development*

<b>Statements</b>	<b>Computer games develop child's cognitive abilities</b>	<b>Computer games are not developmentally valuable</b>
<i>Grade</i>	<i>%</i>	<i>%</i>
1- totally unacceptable	3,44	24,13
2- partially acceptable	10,34	10,34
3- acceptable and unacceptable	31,03	37,93
4- acceptable	34,48	17,24
5- totally acceptable	20,68	10,34

Distribution of parents' estimates on computer game encouraging potential in cognition development varies from acceptance and total acceptance towards indecisiveness and partial acceptance estimates. Part of the parents (3,44%) consider the statement on encouraging value unacceptable.

When it comes to the development value of computer games, most are the parents who are not sure of it, and 24,13% think that computer games have no development value whatsoever.

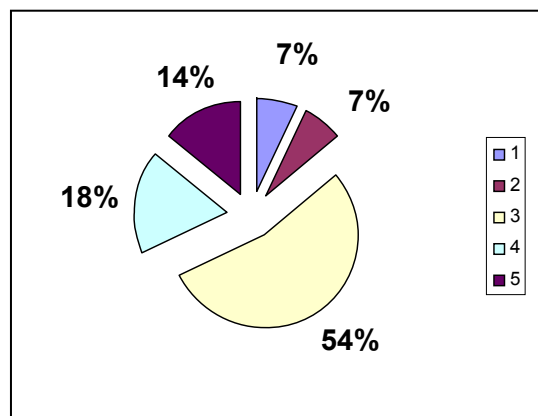
Table 6: *Parents' estimates on the encouraging value of computer games on a child's imagination and computer literacy.*

Statements	Computer games encourage child's imagination	Computer games affect the development of the child's computer literacy
<i>Grade</i>	%	%
1- totally unacceptable	6,89	-
2- partially acceptable	6,89	-
3- acceptable and unacceptable	27,58	8,33
4- acceptable	41,37	41,66
5- totally acceptable	17,24	50,00

Most preschool teachers find the claim on computer games as encouragement for child's imagination acceptable and highly acceptable, whereas the same tendency is even more evident in parents' awareness of the influence computer games have on children's computer literacy.

Pie chart 5: *Parents' estimates on the influence of computer games on child's aggressive behaviour*

Parents estimated the acceptance of the following statement: *Computer games encourage a child to behave in an aggressive way.*



- 1- totally unacceptable
- 2- partially acceptable
- 3- acceptable and unacceptable
- 4- acceptable
- 5- totally acceptable

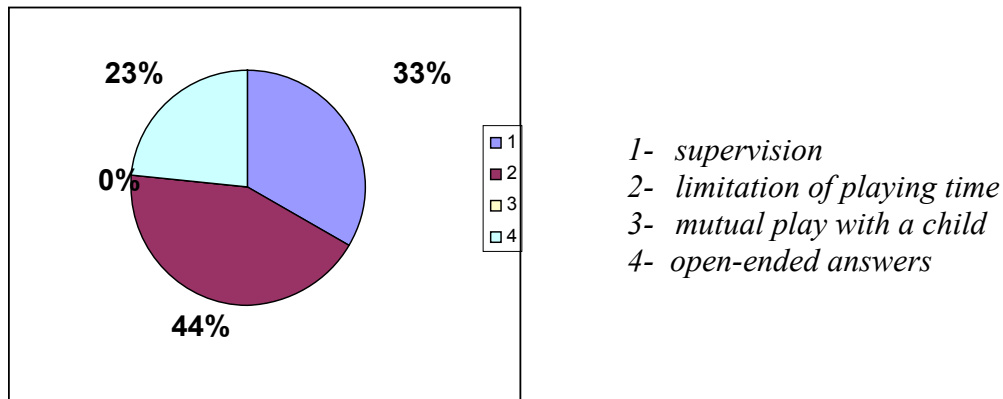
Dilemma regarding computer game influence is also evident in this case. Noticable is the fact that 54,00% of the parents have estimated the statement on computer game aggressive influence on a child as *both acceptable and unacceptable*. Possible reasons for that might lie in contradictory research results concerning connection between computer games and child's aggressive behaviour.

Table 7: *Parents' estimates on whether computer games develop competitiveness and addiction in a child*

Statements	Computer games lead to isolation	Computer games develop addiction in a child	Computer games develop competitiveness
<i>Grade</i>	%	%	%
1- totally unacceptable	24,13	13,79	3,44
2- partially acceptable	6,89	13,79	3,44
3- acceptable and unacceptable	34,48	34,48	27,58
4- acceptable	13,79	24,13	44,82
5- totally acceptable	20,68	13,79	20,68

Regarding the statements on computer games as isolation factor and addiction cause, parents do not take a clear stand, but mostly incline towards acceptance or total acceptance of the statement that computer games encourage children's competitiveness. When it comes to addiction cause in a child, the largest number of the interviewees estimate it as *both acceptable and unacceptable*, that is, parents are indecisive.

Pie chart 6: *The role that a parent mostly assumes in a computer game*



The largest number of parents are those who see their role as a time keeper, followed by those who rather perceive themselves as supervisors. Not one parent sees him/herself as child's playmate. Parents who have given open-ended answers say that their responsibility lies in a technical support during the game, offering pieces of advice and gradual child's guidance towards selfcontrol.

### **Conclusion**

Conducted research has offered an insight into the child's perception of computer games and their experience while playing. It has also given a significant insight into parents' and preschool teachers' attitudes and educational practice, concerning computer use and computer games in education.

From an interview conducted among children, kindergarten attendants, we have learned about their game practice in a family and institutionalized context, and a little bit more about the nature of a child's personal experience while playing. We find the above mentined insight extremely important because it offers adults (parents and teachers) necessary pieces of information about a child's perspective. Given results confirm attractive nature of computer games among preschoolers, but inspite of that, children would still, put into position to choose, prefer a non-virtual game, that is, a game with a ball. It has been proved that children are capable of estimating attractive and unattractive elements in computer games. Although the main attractive elements for the child are seen in the dynamics, interesting content and personal sense of accomplishment, he/she can also be drawn to the aggressive game topics, which seem enough to warn both parents and teachers. Inappropriate development, that is, inadequate level of demands, not corresponding to child's actual possibilities, can be the reasons why the child refuses to play. These could also include technical problems, insoluble to the child. Children prefer playing computer games with actual playmates, among whom are mostly other children, in the family enviroment brother/sister, and in kindergarten peers.

Questionnaires among parents have revealed their attitudes toward computer games, as well as the place the games should take in a parental educational practice. One third of the interviewed parents do not have any personal experience in computer game playing, and those

who do have, play them only from time to time. Few are those who do it regularly. According to their statements, in most cases the children do play computer games in the family environment. Parents primarily see their role in putting time limitations to game playing, supervising or offering children a choice of games to play. Parents are also facing same doubts concerning development value of computer games, and half of the interviewees believe in their aggressive impact.

The results have shown that, among preschool teachers, there is a larger number of those with personal experience in computer game playing, unlike those among parents. Still, almost one third of the interviewed teachers do not have any personal experience in playing computer games. Only a small number of teachers have been introducing computer games into their educational practice, mostly on one's own or children's initiative, majority on the initiative of the colleagues and educational workers. Only a small part of the teachers use computer games on a regular basis, but most of them on several occasions a week. Although the teachers are far more convinced of the development potential of computer games, parents showed nothing but support and approval when these were introduced to the kindergarten curriculum. Teachers usually see their role in supervising, mostly concerning the time limit or fair play, and rarely as playmates. The circumstances under which computer games should be used in kindergartens teachers primarily see in their positive attitude towards computer games and literacy, only then to be followed by technological equipment and teacher-parent cooperation.

Computer and computer games represent tools which, like any other, can be used in an adequate and developmentally valuable way, but can also be misused. Competent and age appropriate use of computers and computer games in early educational practice includes the use of developmentally appropriate computer software with computer games which allow children an opportunity for learning and collaborative play. Crucial factor of success lies in adults' competence, especially teachers', that is, their knowledge of computer games and their educational potentials, which they use as a base for decision making concerning educational applications of computer games, in order to encourage child development. Development of the teachers' competence in computer use should become a part of their professional education, directed not only towards acquiring knowledge, but also fostering teachers' attitudes and values.

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