

THE COMMUNICATION BETWEEN THE CHILD AND THE COMPUTER

Nataša Rogulja, Giovanna Kirinić, Vesna Markovac

*Nataša Rogulja, The Faculty of Teacher Education of the University of Zagreb, Croatia;
natasaraogulja@gmail.com*

*Vesna Markovac, The Faculty of Teacher Education of the University of Zagreb, Croatia;
vesna.markovac@ufzg.hr*

Giovanna Kirinic , B.A., Elementary School Ivo Andric, Zagreb, Croatia; gkirinic@inet.hr

ABSTRACT

The idea of this research was to gain a direct insight of how children in primary school perceive a computer and usage of a computer according emotional, cognitive and behaviour aspects. There were 99 examinees participating the research, all of them pupils of primary school form 1st to 4th grade. Based on the answers to the survey, differences at perception and usage of the computer among these grades were examined. As the primary interest was to learn if there is a difference among the grades at specific aspects of attitudes and expectations in relation with a child and a computer, the significance of difference between the pairs of grades were not examined but the authors concluded which answer is the most frequent at a specific grade. The main results of this research indicate that there are no significant difference between different grades for the most asked questions. Most of the pupils from 1st to 4th grade perceive the use of the computer at the same way. It may mean that children relatively early gether first and stable attitudes towards the use of the computer. Based on all the answers it can be concluded that children have positive but as well quite realistic attitude towards the use of the computer. The advantages and disadvantages as well as practical implications of this research are given with the possible directions for the future.

Key words: child, computer, communication, differences

INTRODUCTION

Information technology plays a major role in education today. The learning process that is aimed to develop the student's creativity and to arouse interest in and curiosity about exploration (i.e. identifying, analyzing and solving problems) has reached a new level with the appearance of computers and various computer programmes. The computer has become a form of information catalyst, one that opens new possibilities in the processes of knowledge acquisition and transfer. With the appropriate use of various computer programmes it is possible to develop the children's creativity, to provide a chance for them to explore their individuality and at the same time to develop their social skills. However, the most important factor in this whole process is a good teacher, one who is able to put the teacher-student relationship in its proper frame and who is able to recognise the student's true emotional and cognitive needs and potential. Every child has his or her individual, unique needs; not all children take in information in the same way, they do not perceive it in the same way and they

do not come up with solutions to problems in the same way. The communicative competence the teachers must possess includes two principal skills: the cognitive, that help determine the way to successfully realise personal and professional goals, and the behavioural, that help the actual fulfilment of those goals (Itković 1999, 114). Education as a whole, but with a special emphasis on school education because it provides the basic general and cultural knowledge, is based on communication (Bratanić, 1996, 65). However, working in education is often influenced by errors in the communication that are the result of the wrong methods used to discipline students. When dealing with problematic students, schools usually use the methods of coercion and threat (Glasser 1994, 39). But, threats and coercion in schools, as in life in general, only make the problems worse and cause further frustration for both teachers and students. At the moment some form of force is used on the student because he or she does not do something he or she is told to do, that student starts showing resistance, and then a personal struggle for power begins between that student and the teacher (Glasser 1994, 40). That is why it is important that in their communication with the students the teachers should be themselves, i.e. they should act naturally. The success of education is largely dependant on the quality of interaction and the level of interaction in communication (Bratanić 1991, 75). The teacher has to adjust his or her programme according to the way the students use the computer. In doing so, the teacher develops the student's social skills as well improves the mutual interaction in communication. In this respect, the computer represents a link between the student and the teacher. Thus, what technology and various programmes can provide, if we get to know the students we are working with, is the ability to improve, develop and help nurture the students' social skills (Riel 1994).

Children approach the computer, much like all communication, with their cognitive, emotional and behavioural abilities. There is some research that shows that computers do not represent an obstacle to the cognitive development of the child. As part of one project, the students were interviewed side by side by a computer (with an animated face and voice of a human) and a human interviewer. The result showed that there were no differences in the students' answers to the computer or to the human (they answered questions related to the activities the students had done with the teacher). The only difference occurred when the students were supposed to talk with the computer about certain details about the secrets the children had: they were more willing to share their secrets with the human interviewer than with the computer (Powell et al. 2002).

When working with the computer, the child's perception deals with taking in information, recognizing its meaning and trying to use its symbols to make his or her own judgment, reach conclusions, or find solutions to problems. Research from all over the world has shown that computers enable social interaction and cooperation; they help children make friends and help their constructive participation in group work (Wartella & Jennings, 2000). However, some authors claim that the use of computers has no significant impact on the development of the child's social skills or relationships with other children or family, in either positive or negative senses, and that, in fact, spending too much time on any free activity (including computers) at the expense of other activities has a negative impact on the child's social and educational development (Subrahmanyam et al. 2000, Von Feilitzen & Carlsson, 1999).

With this respect, it has been proven that the children who participate in classes (projects) where both computer- and other non-computer- based activities are used develop their verbal skills, their ability to solve problems and they improve their long-term memory and intelligence. On the other hand, the children who use only computers show improvement in their intelligence and memory, but they do not show progress in other educational aspects (Haugland 1992). Thus, although technology is not always useful or appropriate, it is certainly not undesirable. The key to using computer technology is a good and well-balanced

curriculum adjusted to the children's development in all senses. It is necessary to take into account several factors: social interaction (teacher-student, student-student and student-computer), computer-based learning and the computer-based curriculum (AAAS 1999). It is therefore, left to the teacher to observe and recognise the work of the child and to direct it. The children then develop their social and computer skills at the same time. The child's awareness plays the key role in this whole process, and that is why the primary role of the novelties in education is to enable the students to upgrade their approach to work and simultaneously to form the proper self-image (Papert, 1980).

The first step of this process of building up the child's awareness is determining the child's attitude to using the computer. Therefore, the goal of this research is to gain an insight into the attitude of the children who use computers in order to get a clear notion of the children's attitude towards computers, which can help teachers in their work with children and in the creation of a better education process. The goal is to find out how the children perceive the computer, their relationship to it, the level of importance the children assign to it, and what they expect from it.

RESEARCH METHODS

According to the main objective, the research was defined. The authors tried to determine differences among pupils of the specific grade in the areas: treating a computer, feeling anger in relation with a computer, feeling fear of a computer, expectations of the pupil from a computer, expectations of a computer from a child, object of anger because of computer use, and wishes of opportunities of computer use.

The research was conducted in natural conditions at occasional sample of examinees. Therefore it has a little feasibility of generalization but it gives directions for a pedagogical work of higher quality.

There were 99 examinees at Elementary School Ivo Andric, Zagreb, Croatia, participated this research, 22 of these in 1st grade, 28 in 2nd grade, 26 in 3rd grade and 23 pupils in 4th grade. The examinees were with uneven relevant factors (socio-economical family status) and they were of the same age and homogenous according to the educational level. Data about the sex of the examinees were not taken because the authors were interested in attitudes not regarding to the sex. As the research was taken in the same primary school it was supposed that the conditions of work within the school are the same.

In this research demographic variables were not collected except of the grade of examinee (that covers the chronological age). Grades of the pupils is independent variable of the research.

Dependant variable are the answers to seven given questions (41 of them).

All variables are categorial (dihotomical) and the answers for individual options are YES or NO (at the nominal scale). Precise list of questions from the questionnaire is given in the tables 1 to 7.

Methods of data processing: data processing was conducted with program package SPSS. Data about the number of YES and NO answers for individual answers from the questionnaire were used to determine descriptive characteristics. These are given in tables 1 to 7 as results greater or smaller than median.

Median test was used to determine differences in answering individual questions among pupils of different grades. As the primary interest was if there is difference among different grades at individual aspects of attitudes and expectations in relation with a child and a computer, significance of differences between the pairs of grades was not tested but it was concluded which answer is the most frequent at particular grade.

RESULTS AND DISCUSSION

The main result of this research for most questions indicates that there are no statistically significant difference among different classes. Questions No. 4 i 5. show no statistically significance according to the age of different pupils. Therefore we can conclude that most of the pupils from first to fourth grade perceive use of computer on the same or similar way. It can be explained with the fact that children early gain insight about the possibilities of computer use as well as they get the stable attitude towards the use of computer. Taken on the average children have positive but as well realistic attitude towards the use of computer.

Further, the text gives results for all researched questions that are presented in tables 1 to 7 in details. Tables includes the results of Median test of significance of difference at attitudes among first four grades in primary school.

Table 1. Median test for the question: "When using a computer I treat it as it is...."

Answers		CLASS				Chi-Square	Asymp. Sig.
		1	2	3	4		
Living being	> Median	0	8	0	3	14,730	p<,01
	<= Median	22	20	26	20		
Friend	> Median	8	11	13	11	1,281	p>,20
	<= Median	14	17	13	12		
Usual thing	> Median	6	2	7	2	6,458	p>,05
	<= Median	16	26	19	21		
Toy	> Median	3	5	0	3	4,769	p>,10
	<= Median	19	23	26	20		
Robot that knows everything	> Median	1	0	2	3	3,987	p>,20
	<= Median	21	28	24	20		
Big machine that is not for children	> Median	0	0	0	0	100,00	p>,20
	<= Median	22	28	26	23		
Complicated machine that can be easily broken down	> Median	4	2	4	1	3,106	p>,20
	<= Median	18	26	22	22		

Table1 shows that most children in all grades treats a computer as towards their friend. According to the number of results below and above median statistically significant difference is found at treating computer as a living being where there is not found any difference at different age group.

There is not found a pupil in any grade that things of computer as of a big machine that is not for children. Based upon this and other answers to this question it is noticed that children

of all grades have comparably (high) positive attitude towards computers. Great number of results below median point at unreal (robot, living being) or negative attitude towards using a computer (complicated, not for children) shows that children have positive and realistic attitude towards computers.

Table 2. Median test for the question: "Are you sometimes angry with the computer?"

Answers		CLASS				Chi-Square	Asymp . Sig.
		1	2	3	4		
Yes, because it wouldn't listen	> Median	2	15	1	5	22,425	p<,01
	<= Median	20	13	25	18		
Yes, because it doesn't understand me	> Median	1	5	1	1	5,032	p>,10
	<= Median	21	23	25	22		
Yes, because it is stupid	> Median	2	1	1	0	2,434	p>,20
	<= Median	20	27	25	23		
Yes, because it is slow	> Median	5	4	5	10	6,528	p>,05
	<= Median	17	24	21	13		
No, because it doesn't have brain	> Median	4	2	1	1	4,114	p>,20
	<= Median	18	26	25	22		
No, because I know that it was my mistake	> Median	8	1	16	6	21,616	p<,01
	<= Median	14	27	10	17		

Table 2 shows even two significant differences found at question "Are you sometimes angry with the computer?". Most of the answers to this question is below median which means answers are NO. The strongest anger towards the computer is shown at 2nd grade pupils and the most realistic attitude (I made a mistake) at the pupils at 3rd grade. Regular age trend considering the attitude that shows anger towards the computer is not noticed. These results can be explained only based on quality arguments that the pupile give to the answers. However, the posible reason could as well be a teacher ot an adult that introduces information technology to the children.

Table 3. Median test for the question: "Are you afraid of using a computer?"

Answers		CLASS				Chi-Square	Asymp. Sig.
		1	2	3	4		
Yes, I am afraid of breaking it down	> Median	6	10	5	2	5,606	p>,10
	<= Median	16	18	21	21		
Yes, because I am not sure whether it would understand what I want from it	> Median	3	3	0	1	4,247	p>,20
	<= Median	19	25	26	22		
Yes, I am afraid of going wrong way and that I wouldn't know how to get back	> Median	1	5	1	0	7,333	p>,05
	<= Median	21	23	25	23		
No, because you can always correct things	> Median	4	5	3	13	15,899	p<,01
	<= Median	18	23	23	10		
No, because I have someone to ask for help	> Median	8	5	17	7	13,755	p<,01
	<= Median	14	23	9	16		

Table 3 shows two significant differences at answers: "No, because you can always correct things" and "No, because I have someone to ask for help". Clear trend according to age is noticed at answer "you can always correct things" where older pupil (possibly because they know computers better) have more positive attitude towards the possibility of correcting mistakes when using a computer. However, there is no clear trend according to the age at question "...I have someone to ask for help". Therefore it is more likely to accept earlier interpretation where some attitudes of pupils depend on a teacher or an adult who introduces a pupil with information technology. The one who advises children from the beginning not to be afraid of computers and that all the mistakes can be corrected can induce more positive attitude of children towards the possibility of correcting the mistakes and reduced fear of computers. In this case these can be 3rd grade teachers.

Table 4. Median test for the question: "What do you expect of your computer?"

Answers		CLASS				Chi-Square	Asymp. Sig.
		1	2	3	4		
To listen to me	> Median	6	9	6	5	0,891	p>,20
	<= Median	16	19	20	18		
To obey my orders	> Median	5	6	3	6	1,818	p>,20
	<= Median	17	22	23	17		
If it doesn't understand what I want it should ask me	> Median	1	5	0	2	6,270	p>,05
	<= Median	21	23	26	21		
If I make a mistake it should warn me	> Median	5	4	7	9	4,244	p>,20
	<= Median	17	24	19	14		
I don't expect anything	> Median	5	3	10	2	8,917	p<,05
	<= Median	17	25	16	21		

One difference is found in table 4 among the pupils of different grades. Absence of pupil's expectations from the computer decreases with the age. Older pupils expects from the computer more which can be conditioned by greater knowledge and the possibilities of different use of computers. However, average results shows that pupils expect from the computers a little.

Table 5. Median test for the question: "What do you thing your computer expects of you?"

Answers		CLASS				Chi-Square	Asymp. Sig.
		1	2	3	4		
That I understand how it works	> Median	2	6	4	3	1,567	p>,20
	<= Median	20	22	22	20		
That I give it orders slowly one by one	> Median	1	0	0	3	7,097	p>,05
	<= Median	21	28	26	20		
That I am patient while it works	> Median	5	6	4	3	1,049	p>,20
	<= Median	17	22	22	20		
Not to kick it whan I am angry	> Median	3	8	9	5	3,094	p>,20
	<= Median	19	20	17	18		
To use it correctly	> Median	8	3	6	7	5,050	p>,10
	<= Median	14	25	20	16		
Not to switch it on and off too often	> Median	3	5	3	2	1,008	p>,20
	<= Median	19	23	23	21		

Table 5 does not show any differences among pupils of different grades. Expectations of the computers in relation to children (according to children's point of view) are comparable. However, average results show that children does not expect a lot from the computers. As well it is indicative that there is tendency among pupils of being careful not to damage the computer phisically. At the other hand this tendency might be more developed (careful use of the computer).

Table 6. Median test for the question: "When you want to use your computer and 'it doesn't listen' or 'it doesn't understand' who are you angry with?"

Answers		CLASS				Chi-Square	Asymp. Sig.
		1	2	3	4		
Myself	> Median	1	2	0	4	5,920	p>,10
	<= Median	21	26	26	19		
Computer	> Median	12	9	9	9	2,981	p>,20
	<= Median	10	19	17	14		
People who made the program	> Median	0	6	1	4	8,076	p<,05
	<= Median	22	22	25	19		
Nobody	> Median	9	11	16	6	6,536	p>,05
	<= Median	13	17	10	17		

Table 6 indicates one statistically significant difference at the answer that suggest anger towards the computer. Pupils are mostly angry at the people responsible for creating the program but age (less anger with age of children) is not clearly noticable. Therefore, in this

case interpretation about attitudes depending upon teachers or adults that introduce computers to the children is probable. At the other hand it may not be educatively desirable that children are at least angry with themselves because it would not develop self-criticism at children using the computer.

Table 7. Median test for the question: "What would you like your computer to be able to do?"

Answers		CLASS				Chi-Square	Asymp. Sig.
		1	2	3	4		
To praise me when I do something good	> Median	4	7	3	2	3,037	p>,20
	<= Median	18	21	23	21		
To correct my mistake and write what I have made incorrectly	> Median	1	1	5	3	4,668	p>,10
	<= Median	21	27	21	20		
To warn me that I should or shouldn't do something	> Median	2	4	1	0	4,516	p>,20
	<= Median	20	24	25	23		
To be able to talk to it	> Median	1	1	6	2	6,933	p>,05
	<= Median	21	27	20	21		
To be able to answer my questions	> Median	0	0	7	0	21,149	p<,01
	<= Median	22	28	19	23		
To be able to explain what I don't know	> Median	3	3	3	0	3,128	p>,20
	<= Median	19	25	23	23		
To be able to remind me when I forget something	> Median	3	1	0	0	7,304	p>,05
	<= Median	19	27	26	23		
To give me an idea what I could do with it when I don't have my own	> Median	3	2	1	1	2,114	p>,20
	<= Median	19	26	25	22		

In table 7 all the answers describe the way a child really communicate with the computer. However, statistically significant difference between pupils of different grades appears at the answer "to be able to answer my questions" where most children does not think the computer is able to answer except of the pupils in 3rd grade. Here as well, the age trend is not noticeable which can be potentially explained by greater (maybe of more quality) engagement of the teacher in 3rd grades when introducing the computer to the children.

The quality of this research is at immediate sight into the attitudes of children towards the computers and their expectations at using the computers. As well as at getting the specific directions for work in practice (maybe greater engagement of teachers in other grades, not only the 3rd grades, introduction of computers and their opportunities of more quality). Weakness of this research can be described as relatively small and occasional sample of examinees, absence of control group of examinees, relatively simple set of instruments as well as absence of data about sex and other demographical characteristics that could possibly give some additional aspects of the relation between the child and the computer which could indicate age difference among children. Considering these but other weakness as well, suggestions for further researches are gathered. It would be useful to gather data about qualifications of the

parents, experience of parents and children at using the computer etc. From the methodological point of view, better analyse with multi-degree evaluation instead of YES and NO, evaluations using Likert scale, greater number of questions with clearer and more defined theoretical starting point. Considering the sample, it would be better to use random or stratified and in any case greater sample and to have control group of examinees.

CONCLUSION

The main result of this research for all given questions indicates that there are no statistically significant difference among different classes. Therefore we can conclude that most of the pupils from first to fourth grade perceive use of computer on the same or similar way. It can be explained with the fact that children early gain insight about the possibilities of computer use as well as they get the stable attitude towards the use of computer. Taken on the average children have positive but as well realistic attitude towards the use of computer.

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