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PRESCHOOL AND PRIMARY SCHOOL PEDAGOGY SPECIALIZATION STUDENTS' OPINION ABOUT COMPUTERS IN EDUCATION

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Abstract. Computers became an important tool in most of the working places. Also, children today grow with different technological devices around, they start to use them from very early ages. Thus Education should integrate these technological devices from more purposes: they are attractive for children, they need to learn how to use them properly and usefully, and they will need this technological knowledge in their future. Teachers, first of all, need a positive attitude towards integrating computers in Education, and also they need methodological and technological knowledge for a successful computer assisted teaching. The aim of this paper is to present a research on Preschool and Primary School Pedagogy specialization students' attitude towards computers in Education. The results show, that the respondents don't really consider computers useful in preschool, they consider them more useful in primary school. Students see the advantages and disadvantages of using computers by the children at home or in classroom. Students' attitude towards the use of computer by the children could change in time.

Keywords: computer assisted teaching, preschool, primary school, preservice teachers, attitude towards computer assisted teaching.

Introduction

Computers became an integrated part of our life, both at home and at work. Children use them starting from very low ages and technology is attractive for them. But it matters how and for what they use the computer. Also, they need to know to use different technological devices for their future study and work. Thus education should incorporate the opportunities offered by the computer and teach children how to work on it usefully. Integrating technology in education become an important issue (Chen & Jang, 2014). The emphatize on interating computers in education is high, thus there are cases when technology is used in the classroom only for the sake of using it, without a clear methodology. Pre-service and in-service teachers are not sufficiently prepared to integrate technology in their teaching (Agyeid & Voogt, 2012). Successful use of computers in education has barriers as lack of technology and adequate educational softwares in schools; or lack of teachers' knowledge on methodology and computer use (Brinkerhof, 2006; Dawson, 2008). But first of all a teacher should have a positive attitude towards computer based Education in order to be able for a successful integration of technology in his/her teaching practice.

Starting with the 2014/2015 university year digital textbooks were introduced even in primary school. In that academic year every pupil got a traditional textbook, a CD/DVD with the digital format of the textbook, and access to a platform, where interactive activities were stored (Cojocnean, 2016). In this way computers are officially entered primary school education. In 2016 80% of the primary school teachers considered digital textbooks useful, but only 41% of them used these digital books daily, 73% used the games and interactive materials from these books (Intuitext, 2006). In the research of Magdaș and Drîngu (2016), only 29,31% of the respondents declaired that they us the digital textbooks, 47.05% of them frontally using a videoprojector and 35.29% of them encourage pupils to use it at home. Only 17.64% of those using digital textbooks use them in a multimedia cabinet. Those not using the digital

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textbooks invoke lack of technical infrastructure for using digital textbooks in the class education (Cojocnean, 2016; Magdas & Drîngu, 2016), or they consider digital technology not adequate for pupils (Magdas & Drîngu, 2016).

In this paper we present a research on Preschool and Primary School Pedagogy specialization students' attitude towards using computers in Education.

Theoretical background

Computers start to be used even from the very beginning of formal education, in preschool. In the last years many games, educational softwares, and digital textbooks were developed for this age group (Vandewater, 2009). The use of digital technology has both positive and negative impact on young children. As positive effect, it can develop positive attitude towards learning, improve reading skills and visual intelligence, develop psychomotor skills, and contribute to language learning (Li, Atkins & Stanton, 2006; Jackson et al., 2011). As negative effect, it increase the risks of obesity and musculoskeletal problems (Bremer, 2005), it can develop addictive disorders and aggressive behavior (Subrahmanyam et al., 2000; Wu et al., 2014), and it can lead to social isolation (Jackson et al., 2011). Taking in consideration these positive and negative effects, the attitude towards using computers in early childhood is very variant among teachers.

Teachers' attitude towards computer use is strongly related with the success of integrating computers in their classroom (Myers & Halpin, 2002). For a successful integration of computers in teaching teachers need, first of all, a good knowledge level in the content of their subject, in the methodology of teaching their subject, and in use of technology. But also they need to merge these three domains. This merge is called in literature as technological pedagogical content knowledge (Harris et al., 2010).

Teaching experience don't have a significant effect on teachers' technological pedagogical content knowledge (Hsu et al., 2017). Also, technology usage did not significantly affect teachers' technological pedagogical content knowledge (Saltan & Arslan, 2017), which contradicts an earier study showing that pre-service teachers using ICT have a higher technological pedagogical content knowledge (Kabakci Yurdakul & Coklar, 2014). Pedagogical content knowledge is important for a successful integration of technology in teaching (Marchis, 2013).

Another aspect is related with the responsibility related with computer use by young children. As many studies show that preschool children already intensively use computers at home (for example, Dhingra et al., 2009), the preschool educators consider that the main responsibility belonging to parents (Siibak & Vinter, 2010).

Research

The research was carried out at the end of the first semester of the university year 2015/2016 and the beginning of the second semester of the university year 2016/2017.

Research tool

The research tool was an online questionnaire with 20 questions, 3 demographical questions, and 17 related with the topic of the research. 13 questions are closed one (checkbox, multiple choice and grid) and 7 open questions.

Sample

114 Preschool and Primary School Pedagogy specialization student have participated in this research, 15 first year, 31 second year, 52 third year, and 16 master student. 33.33% of the respondents is already teaching. Only one respondent is men, this underrepresentation of men is typical for preschool and primary school teachers. Students extensively use computers, as 14,04% of them stays in front of the screen more than 4 hours, 35.96% between 3 and 4 hours (Figure 1). For 32.46% of the respondents only 20-40% of this computer time is work, for 31.58% of the students 41-60% is work (Figure 2).

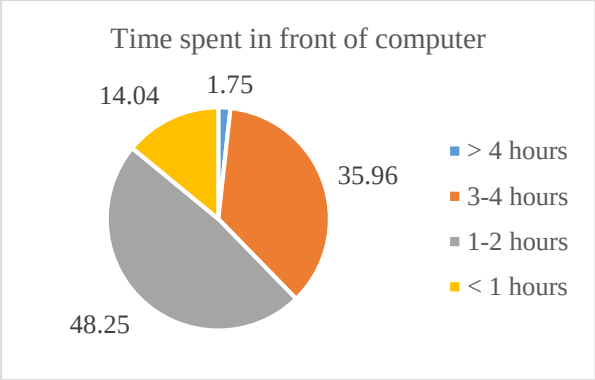

Figure 1. Time spent in front of the computer by the respondents

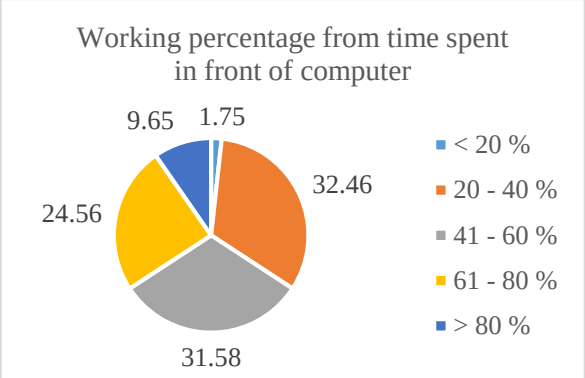

Figure 2. The percentage spent with working from computer time

Research methodology

The online questionnaire was applied at the end of the first semester of the university year 2015/2016. In the beginning of the second semester of the university year 2016/2017 18 third year students, who had completed the quationaire in their second year, have filled it again.

The obtained data was quantitely and qualitately analyzed. The closed questions were statistically processed; the open question were studied, and statistical data were extracted or qualitatively analyzed.

Results and discussion

Advantages and disadvantages of using computers by pupils

We had an open and a closed question (with five items) for both advantages and disadvantages of using computers by pupils.

In case of the open question related with the *advantages of using computers by pupils* we analyzed each answer, extract the enumerated advantages, and counted how many times each appears. The results are summarized in Table 1.

We could observe that almost all of the students see computer as an information source (106 responses). Another roles of the computer in opinion of the students are communication (29 responses), document editor (13 responses), or relaxation (12 responses). 21 students highlighted the joyful learning possibilities offered by the computer. Also, computers help in language learning, especially learning English (12 responses).

Table 1. Advantages of using computers by pupils extracted from the texts given by students

Advantage	Number of occurrence
Information source	106
Learning the technology of using computers	31
Communication tool	29
Joyful learning	21
Tool for editing documents	13
Learning languages	12
Tool for relaxation (music, film, etc.)	12
Developing logical thinking	7
Increasing independency	6
Creating a broader perspective	6
Developing concentration	5
Eye-hand coordination	4
Developing attention	3
Developing creativity	2

Increasing vocabulary	2
Developing memory	1
Developing algorithmic thinking	1
Developing problem solving competence	1
Developing visual skills	1
Developing critical thinking	1
Developing orientation skills	1

We also had a closed question with items related with the advantages of using computers by preschool or primary school pupils. We enumerated the following advantages: eye-hand coordination, developing attention, developing concentration, developing memory, and learning languages. Respondents had to evaluate these advantages on a 4-level Likert scale. Students consider learning languages the most important advantage (M=3.33, SD=0.68), then developing concentration (M=2.63, SD=0.78), developing attention (M=2.61, SD=0.81), developing memory (M=2.59, SD=0.79), and eye-hand coordination (M=2.47, SD=0.80).

We analyzed how students' opinion changed from 2nd year to 3rd. The results are included in Table 2. We observed that there is no statistically significant change about any of the given advantage.

Table 2. Comparing the change of students' answers regarding advantages of the computer in preschool and primary school from 2nd year to 3rd year

		M	SD	t	df	p
Eye-hand coordination	2nd year	2.26	0.65	-2.036	18	0.056
	3rd year	2.68	0.45			
Developing attention	2nd year	2.58	0.70	0.000	18	1.000
	3rd year	2.58	0.70			
Developing concentration	2nd year	2.68	0.56	0.809	18	0.429
	3rd year	2.47	0.59			
Developing memory	2nd year	2.63	0.36	0.645	18	0.527
	3rd year	2.47	0.49			
Learning languages	2nd year	3.42	0.37	-1.316	18	0.205
	3rd year	3.68	0.34			

In case of the open question related with the *desadvantages of using computers by pupils* we analyzed each answer, extract the enumerated desadvantages, and counted how many times each appears. The results are summarized in Table 3. As the computer as information source was seen as an advantage by almost all the students (Table 1), this advantage could hide dangers too (Table 3), as children can access information not adequate for their age (34 responses) or incorrect information (5 responses). Also, too much computer use can lead to health problems as vision problems (28 responses), incorrect posture and spine problems (21 responses), nervous system problems (5 responses), and headache (3 responses). Some of these health problems also occurs because a child sitting too much in front of the computer doesn't do enough physical exercises (14 responses), which could lead to obesity (1 respons). Also too much computer time could lead to dependency (17 responses).

Table 3. Desadvantages of using computers by pupils extracted from the texts given by students

Advantage	Number of occurrence
Inappropiate information for their age	34
Vision probems	28
Too much or inappropriate games	28
Useless time spending	27
Inadeqvate socialization	26
Incorrect posture, spine problems	21
Dependency	17

Too much films/cartoons	15
Too less physical exercises	14
Inappropiate use of the social networks	12
Agressivity	10
Too less time outdoor	10
Too less time for reading books	7
Nervous system problems	6
Handwriting	5
Incorrect information	5
Incorrect spelling	5
Decreasing creativity	3
Headache	3
Undeveloped oral communication	2
Obesity	1

We also had a closed questions with five items related with the disadvantages of using computers by preschool or primary school pupils. We enumerated the following disadvantages: eye problems, posture problems, social closedness, increasing agresivity, and dangers of the virtual world. Respondents had to evaluate these disadvantages on a 4-level Likert scale. Students consider the dangers of the virtual world (M=3.30, SD=0.72), posture problems (M=3.29, SD=0.72), eye problems (M=3.11, SD=0.79), increasing agresivity (M=3.01, SD=0.77), and social closedness (M=2.89, SD=0.77).

We analyzed how students' opinion changed from 2nd year to 3rd. The results are included in Table 4. We observed that there is statistically significant change on the opinion about two of these disadvantages: posture problems and dangers of the virtual world. Both disadvantage is considered less present by the students in 3rd year than in 2nd year. Related with the posture problems students' opinion changed from M=3.53, SD=0.26 in the 2nd year to M=2.89, SD=0.77 in the 3rd year (t(18)=3.618, p=0.001). Related with the dangers of the virtual world students' opinion changed from M=3.42, SD=0.37 in the 2nd year to M=3.05, SD=0.72 in the 3rd year (t(18)=2.348, p=0.031).

Table 4. Comparing the change of students' answers regarding desadvantages of the computer in preschool and primary school from 2nd year to 3rd year

		M	SD	t	df	p
Eye problems	2nd year	3.21	0.51	1.455	18	0.163
	3rd year	3.00	0.56			
Posture problems	2nd year	3.53	0.26	3.618	18	0.001*
	3rd year	2.89	0.77			
Social closedness	2nd year	2.84	0.58	0.889	18	0.385
	3rd year	2.63	0.69			
Increasing agresivity	2nd year	2.79	0.73	0.766	18	0.454
	3rd year	2.63	0.80			
Dangers of the virtual world	2nd year	3.42	0.37	2.348	18	0.031*
	3rd year	3.05	0.72			

α=0.05

Usefulness of the computer in preschool and primary school

As regarding the use of the computers in preschool or primary school, we had a closed and an open question for both preschool and primary school. Respondents had to evaluate from 1 to 4 how useful they consider computers in preschool respectively primary school, then motivate their answer. We calculated the averages of their responses for the closed questions and qualitatively evaluated the answers for the open questions. Respondents consider computers less useful in preschool (M=1.88, SD=0.84) than in primary school (M=2.82, SD=0.74). The percentage of those chosing variant 4 is 5.26% in case of preschool and it is 19.30% in case of primary school.

We compared the responses of 2nd and 3rd year students (Table 5). There is no statistically significant difference between these two groups. This result is similar to the research by Yilmaz and Alici (2011). They investigated pre-service early childhood teachers' attitude towards computer based learning in Science activities. The result is in contraduiction with earlier studies of Taghavi (2006) and Pamuk and Peter (2009).

Table 5. Comparing 2nd and 3rd year students' answers regarding usefulness of the computer in preschool and primary school (different 2nd and 3rd year students)

		Mean	Variance	t	df	p
preschool	2nd year	1.87	0.78	0.578	18	0.565
	3rd year	1.77	0.49			
primary school	2nd year	2.61	0.31	-1.268	81	0.208
	3rd year	2.83	0.69			

Also, we compared the responses of those teaching and not teaching (Table 6). In case of preschool those students who are already teaching considered computer more useful (M=2.16, SD=0.95) than those not teaching (M=1.74, SD=0.54), and this difference is statistically significant (t=2.567, p=0.011). Also, in case of primary school those students who are already teaching considered computer more useful (M=3.16, SD=0.46) than those not teaching (M=2.67, SD=0.52), and this difference is statistically significant (t=3.554, p=0.000). This result contradicts that obtained by Yilmaz and Alici (2011), as in their study was no statistically significant difference between those students with some teaching practice and those without.

Table 6. Comparing not teaching and teaching students' answers regarding usefulness of the computer in preschool and primary school

		Mean	Variance	t	df	p
preschool	not teaching	1.74	0.54	2.576	112	0.011*
	teaching	2.16	0.95			
primary school	not teaching	2.67	0.52	3.554	112	0.000*
	teaching	3.16	0.46			

α=0.05

We also compared the responses given by the same students in their 2nd and 3rd year (Table 7). In case of preschool students consider computers more useful in their 3rd year (M=2.21, SD=0.40) than in their 2nd year (M=1.79, SD=0.73), but this change is not statistically significant (t= -1.909, p=0.072). In case of primary school students also consider computers more useful in their 3rd year (M=3.26, SD=0.43) than in their 2nd year (M=2.68, SD=0.34), and this change is statistically significant (t= -3.012, p=0.007).

Table 7. Comparing the change of students' answers regarding usefulness of the computer in preschool and primary school from 2nd year to 3rd year

		Mean	Variance	t	df	p
preschool	2nd year	1.79	0.73	-1.909	18	0.072
	3rd year	2.21	0.40			
primary school	2nd year	2.68	0.34	-3.012	18	0.007*
	3rd year	3.26	0.43			

α=0.05

Analyzing students answers for the open questions which ment to explain their choices for the two closed question, we have selected the most relevant motivations.

Those students, who consider computers not useful at all in *preschool*, motivates their opinion by the particularities of the age of the children, i.e. at this age they need a lot of movement, they need to develop social skills, and the most important for them is playing with toys. Below we present some opinions:

> "Children already spend too much time in from of the screen at home. I think, in preschool is important that children play with toys and natural materials."
>
> "A child only can play on computer, and sitting in front of the computer he/she will not learn how to play with other children. This is the age for acquiring social skills, and the computer prevent them from this."
>
> "The preschool should be about games and social connections, and not about how much is in an electronical device. At this age the connection with the reality is the most important. First of all the child should know the medium in which she/he lives, then much later to use the computer for complementing the reality."
>
> "The preschool children need a lot of movement not to sit in front of the computer."
>
> "I think, in the preschool the most important is playing with hands-on toys, moving a lot, and developing social skills. Computer can't assure any of these."

Those students who consider computers a bit or more useful in preschool think that it could be used by the educator for illustrating, but not by the children:

> "For children, if we speak about reality, is important to illustrate. Computers could be used to illustrate topics (for example, celestial bodies, other cultures, etc.) which can be directly experienced by them. "
>
> "It can be used for illustration, for listening music, for watching tales, for showing steps or final product during craft activities."

The students' consider that in preschool children shouldn't sit in front of the computer. Only two students mentioned that educational softwares can be used in preschool and children can develop their knowledge and competences using these programs.

> "There are good educational softwares which can be used in preschool. Using these softs children will be more independent in their learning and their attention is developed."

Those students, who consider computer not useful or not adequate in *primary school*, motivated their opinion with the necessity to develop pupils' skills and competencies not related with technology first:

> "Computers is not useful in primary school until pupils' hand-writing skills are not developed."
>
> "At this age pupils have to do sports and read instead of sitting in front of the computer. Even if pupils sit in front of the computer with the aim of learning, they usually are tempted to do other things instead, as playing games."

Those students, who consider computers useful in primary school, think that they can be used for learning and exercising with educational softwares, for learning languages, for learning typewriting and editing texts. Computers are useful for making learning more colorful and enjoyable:

> 'Pupils can play skill-developing games, the teacher can use pictures, videos and music for presenting new materials.'
>
> 'Computers can be used for illustrating different subjects, and different teaching contents can be made more colorful and joyful with the aid of technology.'

Students consider computers as a tool which motivates pupils for learning and help a closer teacher-pupil relation:

> "There are children who are very interested in computers, and if the teacher is also an expert in their interest can better know them."

Some students think that if pupils anyway use computers at home, in the school the teacher can teach them how to use electronical devices for the benefit of learning.

> "Children today learn very early how to use different electronical devices, and if they are used in the school with the adequate guidance pupils will learn how to use them well, and also the computer assisted learning is more interesting for pupils than traditional teaching."

The benefits and drawbacks of using computers in early ages presented in these motivations are similar with those obtained by Marinović, Cindrić, and Katić (2002). Students in their research underlined more the cognitive development, for example, development of creativity, of children's perceptual capacities, and of intelligence; learning new method of communication.

Conclusions

The paper presented a research regarding Preschool and Primary School Pedagogy students' opinion about integrating computers in Education.

The results show, that the respondents don't really consider computers useful in preschool, this item obtained an average of 1.88 on a scale from 1 to 4. They consider computers more useful in primary school, this item obtained an average of 2.82 on a scale from 1 to 4. Even this average is very low.

Students see the advantages and desadvantages of using computers by the children at home or in classroom. They enumerated as main advantages the big amount of information from the internet, the joyful learning with educational softwares, the easy language learning, and the communication tools offered by the internet. But some of these advantages can have also desadvantages, if used improperly. The big amount of information can harm if pupils access contents not adequate for their age or they can't select de reable information sources. Communication tools can have a negative effect on handwriting and correct spelling and grammar, as on messenger pupils use text without accents, they shorten words or sentences, etc. Social networks used improperly can have many dangers.

The results show that the attitude towards the use of computer by the children could change in time, as there is a significant change in students' opinion from their 2nd year of study to their 3rd year. Also, there is significant difference between the opinion of students who already teaching and students who are not teaching yet.

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