



THE ATTITUDES OF TEACHERS AND SPECIAL EDUCATORS TOWARDS THE USE OF COMPUTERS AND MODERN TECHNOLOGY IN TEACHING CHILDREN WITH DEVELOPMENTAL DISABILITIES

STAVOVI NASTAVNIKA I DEFEKTOLOGA PREMA UPOTREBI RAČUNARA I SAVREMENE TEHNOLOGIJE U NASTAVI SA DECOM SA RAZVOJNIM SMETNJAMA

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ABSTRACT

The goal of education is to provide favorable conditions for creativity, cooperation, actualization, and flexibility in order to prepare students for active work and functioning in society. This is especially important for inclusive education as students with potential. It is necessary that teachers have a positive attitude towards their use of technology in the education process. Our disabilities need specific support that will ensure equality of opportunity and enable them to reach their full aim was to determine the attitudes of class and subject teachers and special educators towards the use of modern technology in working with students with developmental disabilities. We surveyed 248 teachers and special educators. Attitudes were examined using a modified Scale for Assessing Teachers' Attitudes towards Computers Questioner. The results indicate that special educators working with children with autism spectrum disorder (ASD) had higher scores on the dimensions of usefulness ($t = 3.14$, $p < 0.01$) and immersion ($t = 2.10$, $p < 0.05$). Subject-teachers who had experience with children with ASD had less interest ($t = -2.14$, $p < 0.05$) and less confidence in the usefulness of computers ($t = -2.54$, $p < 0.05$). In general, attitudes of all sample groups were positive, when it comes to computer use with children with disabilities. This research shows that there is interest among teachers to implement and integrate modern technology in educational system in the Republic of Serbia. Future research should focus on the impact on motivation and effects of computer use in different school subjects on children's knowledge.

Key words: special educators, teachers, computers, attitudes, developmental disorders.

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SAŽETAK

Računari i savremena tehnologija igraju značajnu ulogu u obrazovnom sistemu, koji teži inovacijama i priprema učenika za život u 21. veku. Računarska pismenost i poznavanje rada u različitim softverskim programima u današnje vreme je jedan od bitnijih veština koju pojedinac treba da poseduje na tržištu rada. Iz tog razloga je od velikog značaja da se učenicima još u nižim razredima osnovne škole približe i predstave ove veštine. Kako bi računari i savremena tehnologija postali deo nastavnog časa potrebno je da nastavniku budu dostupni resursi, da ume da ih implementira u nastavni proces ali i da ima pozitivan stav o upotrebi istih u nastavi. Stavovi nastavnika utiču na nivo veština upotrebe računara i savremene tehnologije, efikasnost treninga, efikasnost implementacije tehnologije u nastavu, kao i stavove učenika prema različitim oblicima tehnologije. Cilj ovog istraživanja je da se utvrde stavovi nastavnika i defektologa prema upotrebi računara i savremene tehnologije u radu sa učenicima sa razvojnim smetnjama. Uzorak čini 248 nastavnika i defektologa. Stavovi su ispitani pomoću modifikovane Skale za procenu stavova nastavnika prema računarima (Teachers Attitudes toward Computers Questionere, Christensen & Knezek, 2009). Rezultati ovog istraživanja ukazuju na razliku u odnosu na polnu pripadnost kod poduzorka defektologa na subkali komfor ($t=-2.37$, $p<0.05$) koja pokazuje da žene imaju veći stepen komfora u odnosu na muškarce.

Ključne riječi: defektolozi, nastavnici, računari, razvojne smetnje.

INTRODUCTION

Studies show that using computers in the classroom, as a form of support for modern learning and teaching leads to a more active, constructive and self-directed learning environment (Afshari, Bakar, Luan, Samah & Fooi, 2009). This environment is crucial in preparing students for life after school. Computer literacy and knowledge of the different software programs nowadays are one of the most important skills that an individual can possess in the labor market. The integration of technology in the teaching process is especially relevant for inclusive education as it aims to lead to social inclusion of people with disabilities. Social inclusion in the 21st century requires the knowledge of computers.

In an inclusive education system, students with various developmental disabilities and specific learning disabilities need specific support that will ensure equality of opportunities and enable them to reach their full potential. At the same time, educators need support related to communication with these students, help in adapting methods, resources and the entire teaching process in accordance with the individual abilities of students (Simpson, McBride, Spencer, Lauder milk & Lynch, 2009). In addition to the obvious benefits for students, the use of modern technology in teaching has benefits for educators as well. If we provide the teacher with appropriate resources in the form of good internet connection, computers, smart-boards and similar equipment, we facilitate access to new and creative teaching methods, search for necessary teaching resources, encourage cooperative learning, presentation and adaptation of teaching materials and much more (Heflin, Shewmaker & Nguyen, 2017). This is of crucial value, as the goal of modern education is to provide favorable conditions for creativity,

cooperation among students, actualization, free expression and flexibility in order to prepare students for active work and functioning in society (Koludrović & Reić Ercegovac, 2010).

There are many factors that affect the willingness of teachers to include modern technology in the teaching process and accept its importance in the learning and teaching process. Factors that lead to positive or negative attitudes can be divided into two types: 1) internal factors that are related to the teacher as a person, and 2) external factors that are related to the larger social, economic, and cultural environment. Previous studies highlight some of the external factors are: the availability of technology and equipment of the school with different forms of technology; the availability of support to teachers during the implementation process; the school's ability to provide training for teachers and other school staff; and to provide time for teachers which will be applied in teaching; the level and quality of training using modern technology; the characteristics of the device used and so on (Afshari et al., 2009; Ertmer, Paul, Molly, Eva & Denise, 1999). On the other hand, many of the external factors can be negligible if internal factors affect teachers' willingness to implement technology in teaching, ie, even if there are no external influences or they are eliminated, beliefs, low self-efficacy and negative attitudes of teachers can significantly hinder this process (Ertmer et al., 1999).

The internal factors of special educators, primary and secondary school teachers as persons affect their attitude towards training for the use of modern technology and the application of that technology in teaching. Their individual attitudes towards technology are reflected directly on the level of competence in the use of computers and other devices, and thus the possibility of efficient and adequate application of technology, teaching process, the possibility of teaching students to use various technologies, the frequency of use of technology in teaching, but also the attitudes of students towards computers and modern technology (Gilakjani & Leong, 2012).

Previous research indicates the connection between teachers' attitudes and the possibility of training in the use of technology, the efficiency of computer implementation and modern technology in the teaching process and the possibility of adapting teaching methods in accordance with the requirements of modern teaching (Gilakjani & Leong, 2012). Research has shown that the level of experience in working with technology is positively correlated with teachers' attitudes, more experience is associated with more positive attitudes towards technology and, therefore, greater willingness of teachers to use different forms of technology in teaching (Buabeng-Andoh, 2012; Teo, 2008; Teo, 2009). Thus, it is found that the attitudes of future teachers towards computers are mostly positive, as well as that they are mostly influenced by the level of self-confidence in working with computers (Pantović et al., 2019). Also, differences in attitudes between teachers of different profiles (social and natural sciences, primary school teachers) in terms of affective component, perceived usefulness, control of use and intention to use computers were found, where primary school teachers differ from subject-teachers in terms of the perception of usefulness and intention to use computers in teaching, that is, in addition to generally positive attitudes towards computers, primary school teachers have different perceptions of usefulness and show less intention to use a computer in teaching. Gender and age differences have not been found to affect teachers' attitudes towards computers and their use (Teo, 2008, 2009). It is also found that students taught by a teacher confident in their computer skills more often use different forms of

technology. The findings of the same research indicate that students taught by such a teacher, who does not have or has little access to various forms of technology, much more often use information and communication technologies in class compared to those with optimal access to technology in everyday life (Wastiau et al., 2013).

The complexity of the device / software, in addition to affecting the attitudes of teachers towards the use of technology affects the perceived usefulness and ease of use. The more complex the technology, it is perceived as difficult to use, and therefore less useful because it requires a lot of time and effort, and possibly financial resources, in order to be trained in the adequate use of a certain device. The perception of technology as less efficient and difficult to use is related to the negative attitudes of teachers towards its use in their work. All this leads to a reduced frequency of technology use in teaching (Teo, 2009b). In contrast, if a teacher perceives technology as useful and easy to use it leads to an increased frequency of technology use (Teo, Milutinović & Zhou, 2016).

Since the use of technology has a mayor impact in formal and unformal education of the children (Klaus, 2016), the aim of this research was to determine the attitudes of teachers and special educators towards the use of computers and modern technology in working with students with developmental disabilities. In addition to this, the research aimed to examine potential factors that influence the attitudes of teachers (age, gender and type of school in which the special educator work in).

METHODS

Sample of participant

Participants. 248 respondents participated in the research: 86 class-teachers (34.75%), 53 subject-teachers (21.4%) and 109 special education teachers (44%). Respondents were employed in regular primary schools (60.9%) and schools for children with disabilities (39.1%) in the Republic of Serbia. The sample included subjects of both sexes, aged 20 to over 55 years.

Designs and procedures

Class-teachers and subject-teachers were mostly employed in regular schools, while special educators were mostly employed in schools for children with disabilities. Class-teachers and subject-teachers and special educators most often worked with children who had autism spectrum disorders (ASD) (54.8%), mild intellectual disability (50%) or mixed specific developmental disorder (32.3%). A complete overview of the prevalence of developmental disabilities in children, and the sum of estimates is not aggregated to 100%, since teachers and special educators in schools encounter various developmental disabilities. The data are presented in order to gain insight into the prevalence of developmental disabilities that the sample worked with.

Measuring instruments

For the purposes of this research, a modified version of the Teachers' Attitudes toward Computers Questionnaire (Christensen & Knezek, 2009) was used. The instrument consisted of 51 items, divided into nine subscales covering the following areas: interest (e.g. "I have a desire to learn a lot about computers"); comfort (e.g. "When I use a computer I feel nervous"); accommodation (e.g. "Learning to use a computer is a waste of time"); interaction (e.g. "Students can learn more if they are provided with Internet access"; this subscale has been modified for the purposes of this research, the term email has been replaced by the term Internet in some items, bearing in mind that the term Internet is a broader framework); anxiety (e.g. "when I use a computer I feel isolated from people around me"); utility (e.g. "Using a computer makes learning easier"); perception (this subscale consists of seven pairs of adjectives, the respondent should choose a position between two opposite adjectives, e.g., unpleasant / pleasant, in relation to how he feels when these adjectives relate to their perception of the computer); deepening (e.g. "I like to read about modern technology"); and significance (e.g., "Having knowledge of computer use contributes to employment"). All items, except the subscale of perceptions, were presented in the form of statements, i.e. attitudes and feelings about computers and their application. Each statement is measured on a five-point Likert-type scale where grades 1 to 5 express the level of agreement with the statement (1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree, 5 = strongly agree), so that higher scores indicate a more positive attitude. Negatively worded items are recorded in data processing. In our research, a high reliability of the scale as a whole was obtained ($\alpha = 0.96$). Individual subscales also had good internal consistency: interest ($\alpha = 0.81$); comfort ($\alpha = 0.92$); accommodation ($\alpha = 0.83$); concern ($\alpha = 0.76$); utility ($\alpha = 0.88$); perception ($\alpha = 0.92$); recess ($\alpha = 0.82$); and significance ($\alpha = 0.80$). In addition to the standardized instrument, a questionnaire constructed for this research was used, which refers to the socio-demographic characteristics of the teaching staff. The questionnaire consisted of closed-ended questions that were used to collect data on: gender, age, type of school in which the expert works, occupation, age, and type of disability of students.

Data processing methods

It was used Spearman's Rho correlation coefficient, t test and p value which determines statistical significance of the obtained results – p.

RESULTS

Attitudes towards the use of computers in relation to the gender of teachers and special educators were assessed using the Attitude Assessment Scale, which covers nine areas: interest, comfort, accommodation, interaction, concern, usefulness, perception, immersion, and significance. Table 2 represents the results for each of these areas in relation to gender.

Table 1. Attitudes of class-teachers and subject-teachers and special educators in relation to gender

	Class-teachers AS (SD) male - female		Subject-teachers AS (SD) male - female		Special educators AS (SD) male - female	
Interest	4,06 (0,50)	4,33 (0,60)	4,24 (0,66)	4,12 (0,66)	3,73 (0,92)	3,94 (0,65)
	t=-1,69, p=0,097		t=0,64, p=0,525		t=-0,93, p=0,368	
Comfort	4,23 (0,51)	4,41 (0,57)	4,44 (0,44)	4,23 (0,71)	3,70 (0,88)	4,11 (0,65)
	t=-1,11, p=0,267		t=1,09, p=0,277		t=-2,37, p=0,019*	
Accommodation	4,42 (0,53)	4,50 (0,40)	4,48 (0,40)	4,40 (0,66)	3,96 (0,83)	4,24 (0,57)
	t=-0,72, p=0,468		t=0,49, p=0,622		t=-1,78, p=0,077	
Interaction	4,28 (0,51)	4,24 (0,61)	4,03 (0,82)	4,07 (0,74)	3,88 (0,84)	4,01 (0,65)
	t=0,26, p=0,794		t=-0,16, p=0,873		t=-0,74, p=0,456	
Concern	3,20 (0,93)	3,05 (0,61)	3,21 (0,71)	2,92 (0,63)	3,46 (0,79)	3,15 (0,78)
	t=0,76, p=0,446		t=1,52, p=0,134		t=1,60, p=0,112	
Usefulness	4,28 (0,50)	4,32 (0,54)	4,14 (0,87)	4,21 (0,65)	4,03 (0,92)	4,12 (0,67)
	t=-0,28, p=0,777		t=-0,33, p=0,740		t=-0,49, p=0,620	
Perception	3,54 (0,85)	3,63 (0,67)	3,80 (0,79)	3,70 (0,76)	3,31 (0,99)	3,46 (0,74)
	t=-0,43, p=0,669		t=0,44, p=0,656		t=-0,79, p=0,428	
Immersion	4,36 (0,39)	4,26 (0,43)	4,19 (0,54)	4,17 (0,57)	3,97 (0,79)	4,04 (0,65)
	t=0,83, p=0,406		t=0,12, p=0,899		t=-0,39, p=0,695	
Significance	4,56 (0,35)	4,48 (0,44)	4,36 (0,44)	4,28 (0,62)	4,05 (0,84)	4,12 (0,66)
	t=0,61, p=0,538		t=0,45, p=0,651		t=-0,45, p=0,650	

* p<0.05

The data in Table 1 show that there were no differences in attitudes between class-teachers and subject-teachers in relation to gender. A difference ($t = -2.37$, $p < 0.05$) was registered among special educators on the comfort subscale, which showed that women have had a higher degree of comfort compared to men.

Table 2. Relationship between attitudes and age in subject-teachers, class-teachers and special educators (Spearman's Rho correlation coefficient)

	years		
	Subject-teachers	Class-teachers	Special educators
Interest	-0,112	-0,095	-0,149
Comfort	-0,160	-0,134	-0,189*
Accommodation	0,018	-0,103	-0,159
Interaction	0,180	-0,209	-0,248**
Concern	0,163	0,126	0,133
Usefulness	-0,087	-0,081	-0,350**
Perception	-0,149	0,063	-0,230*
Immersion	0,104	-0,140	-0,088
Significance	0,062	-0,057	-0,092

** p<0.01 * p<0.05

According to the data shown in Table 2, the age of subject-teachers and class-teachers was not related to attitudes towards computer use. On the other hand, in the sample of special educators there is a negative correlation between attitudes and age in the domain of comfort ($r = -0.189$, $p < 0.05$), interaction ($r = -0.248$, $p < 0.01$), usefulness ($r = -0.35$, $p < 0.01$) and perception ($r = -0.230$, $p < 0.05$). The obtained correlations showed that older special educators had more negative attitudes compared to younger special educators.

Below are the attitudes of subject-teachers, class-teachers and special educators in relation to the experience with the type of disabilities that the student has. In all three subsamples in particular, teachers and special educators were treated for the purposes of analysis as two groups: a group of experts who have experience with a particular type of disorder as opposed to a group that has no experience with that type of disorder. The attitudes of teachers and special educators in relation to the experience with children with ASD are shown in Table 4.

Table 3. Relationship between attitudes and type of disorder (ASD) in class-teachers, subject-teachers and special educators

	Class-teachers AS (SD) yes - no		Subject-teachers AS (SD) yes - no		Special educators AS (SD) yes - no	
Interest	4,40 (0,65)	4,24 (0,57)	3,96 (0,77)	4,34 (0,49)	3,97 (0,68)	3,66 (0,79)
	$t=1,13$, $p=0,262$		$t=-2,14$, $p=0,037^*$		$t=1,75$, $p=0,081$	
Comfort	4,55 (0,40)	4,31 (0,60)	4,32 (0,79)	4,29 (0,50)	4,04 (0,60)	4,02 (0,70)
	$t=-1,74$, $p=0,084$		$t=0,13$, $p=0,897$		$t=0,15$, $p=0,879$	
Accommodation	4,64 (0,31)	4,43 (0,45)	4,37 (0,72)	4,48 (0,42)	4,11 (0,66)	4,21 (0,62)
	$t=2,07$, $p=0,041^*$		$t=-0,67$, $p=0,502$		$t=0,50$, $p=0,550$	
Interaction	4,39 (0,48)	4,31 (0,62)	3,92 (0,93)	4,18 (0,55)	4,04 (0,67)	3,76 (0,75)
	$t=1,38$, $p=0,168$		$t=-1,27$, $p=0,209$		$t=1,63$, $p=0,105$	
Concern	3,13 (0,76)	3,06 (0,65)	3,13 (0,66)	2,92 (0,66)	3,17 (0,78)	3,34 (0,81)
	$t=0,37$, $p=0,709$		$t=1,10$, $p=0,267$		$t=-0,84$, $p=0,399$	
Usefulness	4,43 (0,49)	4,27 (0,54)	3,93 (0,87)	4,41 (0,47)	4,20 (0,63)	3,66 (0,89)
	$t=1,16$, $p=0,247$		$t=-2,54$, $p=0,014^*$		$t=3,14$, $p=0,002^{**}$	
Perception	3,84 (0,71)	3,53 (0,69)	3,61 (0,86)	3,85 (0,66)	3,46 (0,76)	3,31 (0,90)
	$t=1,79$, $p=0,077$		$t=-1,15$, $p=0,253$		$t=0,79$, $p=0,426$	
Immersion	4,46 (0,36)	4,21 (0,43)	4,07 (0,65)	4,27 (0,45)	4,09 (0,66)	3,76 (0,67)
	$t=2,42$, $p=0,014^*$		$t=-1,03$, $p=0,197$		$t=2,10$, $p=0,034^*$	
Significance	4,59 (0,35)	4,46 (0,44)	4,24 (0,58)	4,37 (0,55)	4,15 (0,67)	3,94 (0,80)
	$t=1,25$, $p=0,214$		$t=-0,86$, $p=0,392$		$t=1,27$, $p=0,206$	

** $p < 0.01$, * $p < 0.05$

The data in Table 3 showed that special educators working with children with ASD had higher scores on the dimensions of usefulness ($t = 3.14$, $p < 0.01$) and immersion ($t = 2.10$, $p < 0.05$) compared to special educators who did not work with children with ASD. The obtained differences explain that special educators who worked with children with ASD believed to a greater extent that computers can contribute to productivity, that they are a

significant part of the educational process and that computers can enhance the learning and professional development. Subject-teachers who had experience with children with ASD had less interest ($t = -2.14$, $p < 0.05$) and less confidence in the usefulness of computers ($t = -2.54$, $p < 0.05$) compared to teachers who had no experience with ASD. Class-teachers who had experience with students with ASD have a higher degree of accommodation ($t = 2.07$, $p < 0.05$) compared to class-teachers who do not work with children with ASD.

Table 4. Relationship between attitudes and type of disorder (mixed specific developmental disorder) in class-teachers, subject-teachers and special educators

	Class-teachers AS (SD) yes - no		Subject-teachers AS (SD) yes - no		Special educators AS (SD) yes - no	
Interest	4,19 (0,67)	4,30 (0,57)	4,34 (0,48)	4,12 (0,69)	4,03 (0,62)	3,79 (0,77)
	$t=-0,69$, $p=0,491$		$t=0,88$, $p=0,379$		$t=1,71$, $p=0,089$	
Comfort	4,32 (0,53)	4,39 (0,57)	4,54 (0,79)	4,25 (0,50)	4,13 (0,65)	3,94 (0,76)
	$t=-0,40$, $p=0,687$		$t=1,20$, $p=0,235$		$t=1,37$, $p=0,172$	
Accommodation	4,47 (0,45)	4,49 (0,42)	4,52 (0,33)	4,40 (0,62)	4,26 (0,64)	4,12 (0,62)
	$t=-0,16$, $p=0,869$		$t=0,53$, $p=0,593$		$t=1,11$, $p=0,266$	
Interaction	3,96 (0,59)	4,31 (0,57)	4,00 (0,75)	4,07 (0,77)	4,05 (0,70)	3,93 (0,68)
	$t=-2,23$, $p=0,028^*$		$t=-0,25$, $p=0,797$		$t=0,85$, $p=0,393$	
Concern	3,13 (0,53)	3,07 (0,72)	2,95 (0,66)	3,03 (0,70)	3,20 (0,72)	3,20 (0,85)
	$t=0,32$, $p=0,749$		$t=-0,32$, $p=0,750$		$t=-0,05$, $p=0,996$	
Usefulness	3,99 (0,63)	4,39 (0,47)	4,25 (0,53)	4,17 (0,76)	4,18 (0,64)	4,03 (0,78)
	$t=-2,99$, $p=0,004^{**}$		$t=0,31$, $p=0,752$		$t=1,07$, $p=0,283$	
Perception	3,44 (0,75)	3,66 (0,69)	3,70 (0,59)	3,75 (0,80)	3,39 (0,76)	3,48 (0,90)
	$t=-1,13$, $p=0,262$		$t=-1,16$, $p=0,871$		$t=-0,59$, $p=0,566$	
Immersion	4,08 (0,46)	4,33 (0,41)	4,13 (0,57)	4,18 (0,56)	4,13 (0,63)	3,92 (0,70)
	$t=-2,19$, $p=0,031$		$t=-2,65$, $p=0,792$		$t=1,59$, $p=0,114$	
Significance	4,44 (0,43)	4,51 (0,42)	4,27 (0,77)	4,31 (0,52)	4,22 (0,63)	4,00 (0,74)
	$t=-0,65$, $p=0,508$		$t=-0,19$, $p=0,848$		$t=1,66$, $p=0,098$	

****** $p < 0.01$, ***** $p < 0.05$

Table 4 indicates that class-teachers who have had experience with students with mixed specific developmental disorder (MSDD) have less positive attitudes than teachers who do not have experience with this type of disorder, in the domain of interaction ($t = -2.23$, $p < 0.05$) and utility ($t = -2.29$, $p < 0.01$). There is no difference in attitudes between class-teachers and special educators based on experience with MDD.

Table 5. Relationship between attitudes and type of disorder (mild intellectual disability) in class-teachers, subject teachers, and special educators

	Class-teachers AS (SD) yes - no		Subject-teachers AS (SD) yes - no		Special educators AS (SD) yes - no	
Interest	4,38 (0,59)	4,21 (0,47)	4,25 (0,55)	4,09 (0,73)	4,01 (0,62)	3,87 (0,78)
	t=2,16, p=0,033*		t=0,86, p=0,390		t=1,35, p=0,168	
Comfort	4,55 (0,40)	4,31 (0,50)	4,32 (0,78)	4,28 (0,62)	4,04 (0,50)	4,02 (0,70)
	t=-1,74, p=0,084		t=0,13, p=0,887		t=0,15, p=0,878	
Accommodation	4,23 (0,31)	4,10 (0,45)	4,37 (0,72)	4,48 (0,55)	4,11 (0,55)	4,21 (0,52)
	t=1,02, p=0,343		t=-0,57, p=0,502		t=0,50, p=0,550	
Interaction	4,38 (0,48)	4,31 (0,52)	3,94 (0,83)	4,18 (0,56)	4,04 (0,57)	3,75 (0,75)
	t=1,38, p=0,158		t=-1,27, p=0,208		t=1,53, p=0,105	
Concern	3,13 (0,53)	3,07 (0,72)	2,85 (0,55)	3,03 (0,71)	3,20 (0,72)	3,20 (0,85)
	t=0,32, p=0,748		t=-0,32, p=0,750		t=-0,05, p=0,885	
Usefulness	4,12 (0,64)	4,06 (0,73)	4,25 (0,53)	4,17 (0,74)	4,18 (0,54)	4,03 (0,79)
	t=0,45, p=0,651		t=0,31, p=0,752		t=1,07, p=0,283	
Perception	3,44 (0,75)	3,55 (0,58)	3,70 (0,58)	3,75 (0,80)	3,38 (0,75)	3,48 (0,72)
	t=-1,13, p=0,252		t=-1,15, p=0,871		t=-0,58, p=0,555	
Immersion	4,08 (0,45)	4,33 (0,41)	4,13 (0,57)	4,18 (0,55)	4,13 (0,53)	3,82 (0,70)
	t=-2,18, p=0,031		t=-2,55, p=0,782		t=1,58, p=0,114	
Significance	4,44 (0,43)	4,51 (0,42)	4,27 (0,77)	4,31 (0,52)	4,22 (0,62)	4,00 (0,74)
	t=-0,55, p=0,508		t=-0,18, p=0,848		t=1,55, p=0,088	

* p<0.05

The data in Table 5 show that class-teachers who have had experience with children with mild intellectual disabilities have more interest ($t = 2.16$, $p < 0.05$) than class-teachers who did not have experience with mild intellectual disability. There was no difference in attitudes between subject-teachers and special educators based on experience with this type of disorder.

Table 6. Relationship between attitudes and type of disorder (moderate intellectual disability) in class-teachers, subject teachers, and special educators

	Class-teachers AS (SD) yes - no		Subject-teachers AS (SD) yes - no		Special educators AS (SD) yes - no	
Interest	4,00 (0,59)	4,31 (0,59)	4,20 (0,55)	4,15 (0,69)	3,88 (0,74)	3,97 (0,65)
	t=-1,53, p=0,129		t=0,02, p=0,844		t=-0,60, p=0,547	
Comfort	4,08 (0,65)	4,41 (0,54)	4,34 (0,50)	4,30 (0,68)	4,00 (0,78)	4,11 (0,53)
	t=-1,65, p=0,102		t=0,18, p=0,854		t=-0,72, p=0,473	
Accommodation	4,23 (0,44)	4,52 (0,42)	4,49 (0,36)	4,41 (0,62)	4,12 (0,67)	4,33 (0,52)
	t=-1,93, p=0,056		t=-0,36, p=0,714		t=-1,57, p=0,118	
Interaction	3,96 (0,61)	4,28 (0,58)	3,77 (1,06)	4,11 (0,69)	4,04 (0,57)	3,96 (0,53)
	t=1,41, p=0,161		t=-1,22 p=0,227		t=1,53, p=0,118	
Concern	3,38 (0,57)	3,04 (0,69)	2,86 (0,80)	3,05 (0,63)	3,14 (0,76)	3,34 (0,82)
	t=-0,06, p=0,951		t=-0,80, p=0,427		t=-0,29, p=0,767	
Usefulness	4,30 (0,55)	4,32 (0,53)	3,76 (1,04)	4,27 (0,62)	4,06 (0,77)	4,19 (0,58)
	t=-1,05, p=0,295		t=-1,97, p=0,054		t=-1,25, p=0,212	
Perception	3,38 (0,60)	3,64 (0,71)	3,58 (0,60)	3,77 (0,80)	3,41 (0,85)	3,59 (0,57)
	t=-1,13, p=0,252		t=-0,69, p=0,494		t=-1,38, p=0,192	
Immersion	4,29 (0,55)	4,28 (0,41)	3,93 (0,61)	4,23 (0,55)	3,97 (0,74)	4,14 (0,47)
	t=-0,06, p=0,949		t=-1,44, p=0,155		t=-1,23, p=0,219	
Significance	4,55 (0,43)	4,49 (0,42)	4,22 (0,55)	4,32 (0,57)	4,04 (0,77)	4,25 (0,50)
	t=-0,39, p=0,698		t=-0,51, p=0,610		t=-1,46, p=0,145	

The data in Table 6 show that the attitudes of subject-teachers, class-teachers and special educators did not differ based on experience with children with moderate intellectual disability.

Table 7. Relationship between attitudes and type of disorder (dyslexia) in class-teachers, subject-teachers and special educators

	Class-teachers AS (SD) yes - no		Subject-teachers AS (SD) yes - no		Special educators AS (SD) yes - no	
Interest	4,36 (0,45)	4,27 (0,60)	4,06 (0,47)	4,17 (0,68)	3,74 (0,62)	3,94 (0,72)
	t=0,38, p=0,702		t=-0,36, p=0,716		t=-1,12, p=0,262	
Comfort	4,54 (0,51)	4,36 (0,56)	4,61 (0,50)	4,26 (0,68)	3,90 (0,70)	4,06 (0,71)
	t=0,80, p=0,424		t=1,24, p=0,221		t=-0,88, p=0,378	
Accommodation	4,44 (0,60)	4,49 (0,41)	4,45 (0,51)	4,42 (0,59)	4,16 (0,75)	4,19 (0,61)
	t=-0,31, p=0,751		t=-0,14, p=0,910		t=-0,20, p=0,840	
Interaction	4,46 (0,41)	4,23 (0,60)	4,07 (0,50)	4,05 (0,79)	3,85 (0,79)	4,02 (0,67)
	t=0,97, p=0,331		t=0,04, p=0,965		t=-0,91, p=0,365	
Concern	3,17 (0,44)	3,07 (0,70)	2,79 (0,82)	3,05 (0,64)	3,45 (0,64)	3,16 (0,80)
	t=0,37, p=0,707		t=-0,90, p=0,427		t=1,43, p=0,154	
Usefulness	4,33 (0,42)	4,31 (0,54)	4,37 (0,50)	4,16 (0,74)	3,95 (0,64)	4,13 (0,73)
	t=0,07, p=0,942		t=0,64, p=0,520		t=-0,96, p=0,338	
Perception	3,31 (0,72)	3,64 (0,70)	4,01 (0,42)	3,70 (0,79)	3,19 (0,76)	3,48 (0,79)
	t=-1,17, p=0,243		t=-0,93, p=0,355		t=-1,45, p=0,148	
Immersion	4,36 (0,29)	4,27 (0,44)	4,00 (0,61)	4,20 (0,55)	3,86 (0,74)	4,06 (0,65)
	t=1,15, p=0,600		t=-0,82, p=0,409		t=-1,15, p=0,251	
Significance	4,71 (0,39)	4,48 (0,42)	3,87 (0,80)	4,36 (0,51)	4,01 (0,72)	4,13 (0,68)
	t=1,37, p=0,172		t=-2,06, p=0,044*		t=-0,66, p=0,507	

* p<0.05

The data in Table 7 show that subject-teachers who have had experience with students with dyslexia have more negative attitudes in the domain of significance ($t = -2.06$, $p < 0.05$) compared to subject-teachers who have had no experience with this type of disorder.

For other types of developmental disorders, the analysis was performed only on a subsample of special educators due to the fact that there are less than 5 respondents on the subsamples of class-teachers and subject-teachers who have had experience with these types of developmental disorders and therefore cannot be treated as a group (Todorović, 2008).

Based on their experience with children with developmental dysphasia, special educators did not differ in attitudes in the domains of interest ($t = -1.09$, $p = 0.227$), conform ($t = -0.94$, $p = 0.354$), accommodation ($t = -1.36$), $p = 0.174$), interactions ($t = -0.80$, $p = 0.422$), concerns ($t = 1.16$, $p = 0.108$), usefulness ($t = -0.66$, $p = 0.507$), perceptions ($t = -1.17$, $p = 0.244$), indentations ($t = -0.39$, $p = 0.697$) and significance ($t = -0.24$, $p = 0.808$). Based on experience with children with severe intellectual disability, special educators did not differ in attitudes in the domains of interest ($t = -1.09$, $p = 0.227$), conform ($t = -0.94$, $p = 0.354$), accommodation ($t = -1,36$, $p = 0.174$), interactions ($t = -0.80$, $p = 0.422$), concerns ($t = 1.16$, $p = 0.108$), utility ($t = -0.66$, $p = 0.507$), perceptions $t = -1.17$, $p = 0.244$), indentations ($t = -0.39$, $p = 0.697$) and significance ($t = -0.24$, $p = 0.808$). Based on experience with dysgraphia, special educators do not differ in attitudes in the domains of interest ($t = -0.33$, $p = 0.742$), comfort ($t = 0.49$, $p =$

0.623), accommodation ($t = -1.17$, $p = 0.244$), interactions ($t = -0.14$, $p = 0.917$), concerns ($t = -1.18$, $p = 0.238$), usefulness ($t = -1.14$, $p = 0.255$), perceptions ($t = -1.50$, $p = 0.193$), indentations ($t = -0.07$, $p = 0.943$) and significance ($t = -0.79$, $p = 0.430$). Based on experience with dyscalculia, special educators do not differ in attitudes in the domains of interest ($t = 0.15$, $p = 0.881$), comfort ($t = 0.92$, $p = 0.359$), accommodation ($t = 1.28$, $p = 0.203$), interactions ($t = 0.67$, $p = 0.500$), concerns ($t = -2.88$, $p = 0.774$), utility ($t = -0.77$, $p = 0.438$), perceptions ($t = 0.11$, $p = 0.912$), indentations ($t = 0.11$, $p = 0.912$) and significance ($t = -0.05$, $p = 0.960$). Based on experience with cerebral palsy, special educators do not differ in attitudes in the domains of interest ($t = -1.60$, $p = 0.114$), comfort ($t = -1.03$, $p = 0.304$), accommodation ($t = -1.59$), $p = 0.116$), interactions ($t = 1.15$, $p = 0.253$), concerns ($t = -1.35$, $p = 0.189$), utility ($t = -1.78$, $p = 0.086$), perceptions ($t = -1.53$, $p = 0.127$), indentations ($t = -1.03$, $p = 0.204$) and significance ($t = -1.29$, $p = 0.207$).

Considering that significant parts of the surveyed special educators worked in regular schools, the attitudes of special educators in relation to the type of school in which they were employed were examined (Table 8).

Table 8. Relationship between attitudes of special educators and type of school they work in

	Special educators working in regular schools AS (SD)	Special educators working in schools for children with disabilities AS (SD)	t	p
Interest	4,11 (0,61)	3,88 (0,72)	1,12	0,264
Comfort	4,48 (0,45)	3,97 (0,72)	2,54	0,012*
Accommodation	4,65 (0,42)	4,12 (0,63)	3,03	0,003**
Interaction	4,39 (0,61)	3,93 (0,68)	2,38	0,019
Concern	3,16 (1,01)	3,21 (0,81)	-0,24	0,809
Usefulness	4,51 (0,63)	4,04 (0,89)	2,32	0,022*
Perception	3,42 (0,76)	3,43 (0,90)	-0,04	0,961
Immersion	4,54 (0,36)	3,95 (0,67)	3,16	0,002**
Significance	4,67 (0,37)	4,03 (0,70)	3,37	0,001**

** $p < 0.01$, * $p < 0.05$

The data in Table 8 show that on the sub-scales of comfort ($t = 2.54$, $p < 0.05$), accommodation ($t = 3.03$, $p < 0.01$), usefulness ($t = 2.32$, $p < 0.05$), immersion ($t = 3.16$, $p < 0.01$) and significance ($t = 3.37$, $p < 0.01$) there are differences in terms of higher values among special educators employed in regular schools. The obtained differences show that special educators employed in regular schools have had more positive attitudes compared to special educators employed in schools for children with disabilities.

DISCUSSION

Since class-teachers and subject-teachers mostly interact with typically developing children, it is understandable that they have more positive attitudes in the possibilities of computer use in class. On the other hand, special educators mostly work with children with disabilities, so their attitudes are expected to be less positive. Special educators are aware of the limitations of children with developmental and intellectual disabilities and that is probably what makes them aware of the time and effort needed in order to teach these children the proper computer use. That also confirms the differences between attitudes of special educators that work in regular schools compared to special educators that work in schools for children with disabilities, because in schools for children with disabilities, special educators face more complex disorders.

Sample of class-teachers and subject-teachers did not differ in the terms of age and sex. There was not much research conducted previously which examined the impact of these factors on attitudes of teachers and special educators. Teo, 2008 did not find sex difference when it comes to teachers attitudes toward computers and computer use in classes. Kay, 2006 found that male teachers are better equipped with necessary skills and have more positive attitudes before the process of implementing computers in classes than female teachers, but these differences are not there after the process of implementation. Markauskaite (2006) indicates that male teachers have more computes literacy, use computes more often, are more confident and competent in working with computers and while in our research we got the opposite results. There was a significant difference between sexes on the sample of special educators on the subscale comfort ($t=-2.37$, $p<0.05$), which indicates that women are more comfortable in using computers in classes than men.

On the other hand, while examining the relationship between attitudes and age, in the group of special educators the age was a significant factor. Younger special educators have more positive attitudes toward computer use than older ones. Possibly, the younger special educators may be aware of more opportunities where computers can be used in classes, but it is important to take in consideration that they were educated in the era of computers, while older special educators started working when computers were not a part of individual's everyday life. The results of the research conducted by Pantovic et al. (Pantović et al., 2018) indicate that students of Faculty for special education and rehabilitation in Republic of Serbia have overall positive attitudes toward computer use while working with children with intellectual and developmental disabilities. Obtaining proper education for students who are unsure of their abilities in working with computers and modern technology can lead to improving those skills and therefore, more confidence in one's abilities and later frequency of implementing technology in their work.

The results which compared relationship between attitudes of special educator and the type of disability they work with are interesting. Special educators that work with children with ASD have more positive attitudes toward computer use with these populations regarding usefulness, productivity and creativity in educational process. On the other hand, subject-teachers that work with children with ASD have less interest and believe that computer use with these children is not useful, in comparison with teachers that do not have experience in working with these populations. These differences can be explained by knowing that main

deficits in these children affect all domains of their everyday functioning, so the technology created for and used by this population is diverse, therefore available, so it is used more often, rather than with other disabilities.

CONCLUSION

In general, attitudes of all three sample groups were positive, when it comes to computer use with children with disabilities. The younger age of the special education teacher is a predictive factor for having more positive attitudes towards computer use in classes. This implicates a deficit in knowledge of technology use in older special educators, which will hopefully change when generations are changed. Knowing the impact of teachers attitudes toward the technology on children they work with, the results of this research show that the process of implementing and integrating computers and modern technology in educational system in the Republic of Serbia has a solid base. Therefore, it is important that special educators and teachers have more possibilities in acquiring knowledge on possibilities of computer use in their classes. This is especially important for subject-teachers who were shown to have less interest in using computers in the learning process of ASD students and empowering them to use technology as a creative tool with this population. In conclusion we recommend further research on this topic by focusing on the following:

1. The impact of computer uses in classes on motivation for learning in children with disabilities.
2. The effects of computer use in different school subjects on children's knowledge.
3. Attitudes of teachers and special educators toward computer use after they received more training.
4. Correlation between the amount of technology use in classes and burnout syndrome in special educators and teachers.
5. The possibilities of computer use in different school subjects.

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