ICT, Digital Rest (or Tiredness?) Spending Free Time in Front of a Screen

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Abstract- The usage of new information and communication technology and systems [1] in the modern society enables easier access to a growing number of services, tools and devices that in the present day are more available to the public than ever before and can be found in every social circle. This article concentrates on the usage of new information and communication technologies and TV among children from seven to ten years of life. The lack of movement and a sedentary lifestyle accompanied by the often usage of devices available to them may lead towards certain disorders among younger children (dyslexia, dysgraphia, dyscalculia, growing number of children with flat feet), especially among children starting the first grade of elementary schools. This article shows a part of research conducted on a representative sample of 1286 subjects in Croatia, Italy and Serbia. In accordance with the needs of this article, the presented results were obtained by analyzing the following variables: time spent in front of the TV and computer daily and during the weekends, ownership of a smartphone, if the rules of the usage of a smartphone are set beforehand by parents/guardians/caretakers, usage of smartphones for accessing on-line video games and if the subjects use smartphones in class without the awareness of teachers and for their personal needs that don't involve the class program. The article presents the results of the application of the NTC learning program which can help in solving the big issue of the urgent need to change the educational system.

Keywords – children, education, free time, ICT, NTC learning,

1. Introduction

Today, children spend their free time in front of some of the available screens, such as computers, laptops, tablets, smartphones, gaming consoles, and the unavoidable TV that is often, along with the mentioned devices, set in the child's bedroom. These devices are available to them most of the time (with some exceptions), so after coming home from school children often enjoy "digital resting" in front of screens that are their false friends or "boredom repressors and/or free-time fulfillers". Besides using some of those devices at school as part of the class program, and often during school hours without the awareness or teachers to repress boredom or fulfill the need to check some of the social networks or play a game to get as much points possible which enables them to reach higher levels not knowing that those games are designed as never ending games; children actively use their smartphones during recess when, instead of communicating with their classmates, they spend their time having virtual conversations or browsing social networks. A similar scenario continues at home, where they should be spending their time in different, healthier ways and hang out with their peers, parents, play sports or enjoy other hobbies. Many authors   [2],[3], [4], [5], [6] link the excessive and inadequate usage of computers to behaviors that lead to aggression in children.

It often happens that children have more knowledge in the IT area than their parents who either don't have the time or are not transliteral, which means they are not able to read, write and communicate through different platforms, tools and media such as print, TV, radio, movie and digital social networks, [7] which makes it difficult for the parents to follow what a child does on the computer or some other IT device, or how much time does the child spend in front of it. Nonetheless, the project Europe 2020 defines digital literacy of citizens as being part of the IT society.

Digital literacy implies the transliteracy of citizens as one of the preconditions of becoming a part of the IT society, which also involves the usage of tools of the new information and communication technology, and media literacy [8]. The lack of quality education among parents is surely a subject of interest not only for the educational institutions, where digital competence is defined as the ability of an individual to use the information and communication technology in a safe and critical way both for communicating and in their personal and social life, but for local communities as well. Its key elements include basic information and communication skills and abilities such as usage of the computer for research, evaluation, storage, creation, display and exchange of information as well as development of cooperative networks on the internet [9].

2. Research methodology

A total of 1286 children, 630 boys and 656 girls, aged between seven and ten, participated in the research. The research was conducted in 15 schools in Croatia, Serbia and Italy. It was done anonymously and the subjects were aware that they had the right to withdraw from fulfilling the questionnaire at any time without consequences, which none of them did. This article shows how much the subjects use the TV, the computer and smartphones and if their parents have set the rules of usage of the smartphone. For the needs of the article, the following variables were considered:

1. Sex
2. Number of subjects by state
3. TV watching during school days
4. TV watching during the weekend
5. Ownership of a smartphone
6. Usage of smartphones during school days
7. Usage of smartphones during the weekend
8. Rules for usage of smartphones set by parents/guardians/caretakers
9. Usage of smartphones for playing online video Table 2. Number of subjects by state
games
10. Usage of smartphones during class

Table 1. Sex

	Frequency	Percent
Male	630	49
Female	656	51
Total	1286	100

Table 2. Number of subjects by state

Country	Frequency	%
Croatia	430	33,4
Italia	274	21,3
	582	45,3
Serbia		
	1286	100,0
Total		

A total of 1286 subjects participated in the research, 33.4% of which were from Croatia, 21.3% from Italy and 45.3% were from Serbia.

Table 3. Watching TV during school days?

Crosstab

			How much do you watch TV during school days					Do not have TV	Total
			Non watching	Less than 1 h	1 to 3 h	3 to 5 h	More than 5 h		
Sex	Male	Count	38	173	238	121	45	10	625
		% within Sex	6,1%	27,7%	38,1%	19,4%	7,2%	1,6%	100,0%
	Female	Count	49	229	223	111	22	7	641
		% within Sex	7,6%	35,7%	34,8%	17,3%	3,4%	1,1%	100,0%
Total		Count	87	402	461	232	67	17	1266
		% within Sex	6,9%	31,8%	36,4%	18,3%	5,3%	1,3%	100,0%

Table 3. shows hours spent watching TV during a school day. One to three hours daily are spent watching TV by 38.1% of the boys and 34.8% of the. girls, while three to five hours a day are spent watching TV by 7.2% of the boys and 3.4% of the girls. An interesting fact is that only 1.6% of the boys and 1.1% of the girls do not have a TV. A total of 6.1% of the boys and 7.6% of the girls doesn't watch TV during school days. Chi-squared test is 18,337, df=5, p=0,003. The results can be considered statistically significant.

Table 4. Watching TV during weekends

Crosstab

			How much do you watch TV during weekends?					Do not have TV	Total
			Non watching	Less than 1 h	1 to 3 h	3 to 5 h	More than 5 h		
Sex	Male	Count	35	86	220	172	89	16	618
		% within Sex	5,7%	13,9%	35,6%	27,8%	14,4%	2,6%	100,0%
	Female	Count	48	134	221	166	65	12	646
		% within Sex	7,4%	20,7%	34,2%	25,7%	10,1%	1,9%	100,0%
Total		Count	83	220	441	338	154	28	1264
		% within Sex	6,6%	17,4%	34,9%	26,7%	12,2%	2,2%	100,0%

Table 4, shows hours spent watching TV during the weekend. One to three hours a day are spent watching TV by 35.6% of the boys and 34.2% of the girls. Three to five hours a day are spent watching TV by 27.8% of the boys and 25.7% of the girls. More than five hours a day are spent watching TV by 14.4% of the boys and 10.1% of the girls, while less than one hour in front of the TV a day is spent by 5.7% of the boys and 7.4% of the girls. Chi-squared test is 16,317 df=5, p=0,006. The results can be considered statistically significant.

Table 5. Using smartphone

Crosstab

			Own smartphone	Parents smartphone	I do not use smartphone	Total
Sex	Male	Count	305	143	167	615
		% within Sex	49,6%	23,3%	27,2%	100,0%
	Female	Count	380	135	133	648
		% within Sex	58,6%	20,8%	20,5%	100,0%
Total		Count	685	278	300	1263
		% within Sex	54,2%	22,0%	23,8%	100,0%

According to the results in Table 5., a total of 49.6% of the boys and 58.6% of the girls owns a smartphone of their own, while 23.3% of the boys and 20.8% of the girls uses their parents' smartphone. The total of 27.7% of the boys and 20.5% of the girls doesn't use a smartphone. Chi-squared test is 11,441 df=2, p=0,003. The results can be considered statistically significant.

Table 6. Using smartphone during school days

Crosstab

How much do you use the smartphone during school days?

			Do not have one	Just for calling	Less than 1 h	1 to 3 h	3 to 5 h	More than 5 h	Total
Sex	Male	Count	166	131	189	84	28	23	621
		% within Sex	26,7%	21,1%	30,4%	13,5%	4,5%	3,7%	100,0%
	Female	Count	132	178	252	59	16	12	649
		% within Sex	20,3%	27,4%	38,8%	9,1%	2,5%	1,8%	100,0%
Total		Count	298	309	441	143	44	35	1270
		% within Sex	23,5%	24,3%	34,7%	11,3%	3,5%	2,8%	100,0%

During school days, 21.1% of the boys and 27.4% of the girls uses the smartphone only for calls. The usage of smartphones for less than an hour during school days is shown in 30.4% of the boys and 38.8% of the girls. Smartphones are used one to three hours a day by 13.5% of the boys and 9.1% of the girls, while 4.5% of the boys and 2.5% of the girls use it for three to five hours a day. The smartphone is used more than five hours a day by 3.7% of the boys and 1.8% of the girls. Chi-squared test is 30,526 df=5, p=0,000. The results can be considered statistically significant.

Table 7. Using the smartphone during weekends?

Crosstab

How much do you use the smartphone during weekends?

			Do not have one	Just for calling	Less than 1 h	1 to 3 h	3 to 5 h	More than 5 h	Total
Sex	Male	Count	156	98	166	111	35	49	615
		% within Sex	25,4%	15,9%	27,0%	18,0%	5,7%	8,0%	100,0%
	Female	Count	128	138	234	99	33	14	646
		% within Sex	19,8%	21,4%	36,2%	15,3%	5,1%	2,2%	100,0%
Total		Count	284	236	400	210	68	63	1261
		% within Sex	22,5%	18,7%	31,7%	16,7%	5,4%	5,0%	100,0%

During the weekend, smartphones are used one to three hours a day by 18% of the boys and 15.3% of the girls. Smartphones are used more than five hours a day by 8% of the boys and 2.2% of the girls, while 27% of the boys and 36.2% of the girls use them less than an hour per day. Chi-squared test is 40,552 df=5, p=0,000. The results can be considered statistically significant.

Table 8. Discussing with parents the rules of usage of the smartphone

Crosstab

			I discussed with my parents the rules of usage of the smartphone		Total
			No	Yes	
Sex	Male	Count	262	331	593
		% within Sex	44,2%	55,8%	100,0%
	Female	Count	229	392	621
		% within Sex	36,9%	63,1%	100,0%
Total		Count	491	723	1214
		% within Sex	40,4%	59,6%	100,0%

The rules of usage of the smartphone were discussed with parents by 55.8% of the boys and 63.1% of the girls, while 44.2% of the boys and 36.9% of the girls never did so. Chi-squared test is 6,722 df=1, p=0,010. The results can be considered statistically significant.

Table 9. Using smartphone for playing video games

Crosstab

			I use the smartphne for playing online games		Total
			No	Yes	
Sex	Male	Count	322	267	589
		% within Sex	54,7%	45,3%	100,0%
	Female	Count	400	212	612
		% within Sex	65,4%	34,6%	100,0%
Total		Count	722	479	1201
		% within Sex	60,1%	39,9%	100,0%

A total of 39.9% of subjects uses the smartphone for playing on-line games, 45.3% of which are boys and 34.6% are girls. Chi-squared test is 14,307 df=1, p=0,000. The results can be considered statistically significant.

Table 10. Using smartphone during classes

Crosstab

			I use the smartphne during classes		Total
			No	Yes	
Sex	Male	Count	569	9	578
		% within Sex	98,4%	1,6%	100,0%
	Female	Count	589	11	600
		% within Sex	98,2%	1,8%	100,0%
Total		Count	1158	20	1178
		% within Sex	98,3%	1,7%	100,0%

During class, 1.6% of the boys and 1.8% of the girls use the smartphone, while 98.4% of the boys and 98.2% of the girls don't use it. Chi-squared test is 0,135 df=1, p=0,714.

Table 11. Using PC during school days

Crosstab

How much do use the PC during working days?

			I do not use it	Less than 1 h	1 to 3 h	3 to 5 h	More than 5 h	Total
Sex	Male	Count	120	232	133	24	16	525
		% within Sex	22,9%	44,2%	25,3%	4,6%	3,0%	100,0%
	Female	Count	184	294	73	11	8	570
		% within Sex	32,3%	51,6%	12,8%	1,9%	1,4%	100,0%
Total		Count	304	526	206	35	24	1095
		% within Sex	27,8%	48,0%	18,8%	3,2%	2,2%	100,0%

A total of 22.9% of the boys and 32.3% of the girls don't use the computer during school days, while 25.3% of the boys and 12.8% of the girls use it for one to three hours a day, and 4.6% of the boys and 1.9% of the girls use it for three to five hours a day. A total of 3% of the boys and 1.4% of the girls use it for more than five hours. Chi-squared test is 43,978 df=4, p=0,000. The results can be considered statistically significant.

Table 12. Using PC during weekends

			Crosstab						
			How much do use the PC during week ends?						Total
			N.a.	I do not use it	Less than 1h	1 to 3h	3 to 5h	More than 5h	
Sex	Male	Count	54	75	189	192	53	51	614
		% within Sex	8,8%	12,2%	30,8%	31,3%	8,6%	8,3%	100,0%
	Female	Count	56	127	276	138	33	12	612
		% within Sex	8,7%	19,8%	43,0%	21,5%	5,1%	1,9%	100,0%
Total		Count	110	202	465	330	86	63	1256
		% within Sex	8,8%	16,1%	37,0%	26,3%	6,8%	5,0%	100,0%

A total of 12.2% of the boys and 19.8% of the girls don't use the computer during the weekend. A total of 31.3% of the boys and 21.5% of the girls use it for one to three hours a day, whereas 8.6% of the boys and 5.1% of the girls uses it for three to five hours a day. The percentage of the boys who use the computer more than five hours a day during the weekend is 8.3, while the percentage of the girls who use it more than five hours a day during the weekend is 1.9. Chi-squared test is 66,739 df=5, p=0,000. The results can be considered statistically significant.

Table 13. Playing outdoors during school days

			Crosstab					
			How much do you play outdoor during working days?					Total
			I do not play outdoor	Less than 1h	1 to 3h	3 to 5h	More than 5h	
Sex	Male	Count	45	129	297	97	45	613
		% within Sex	7,3%	21,0%	48,5%	15,8%	7,3%	100,0%
	Female	Count	62	187	271	83	39	642
		% within Sex	9,7%	29,1%	42,2%	12,9%	6,1%	100,0%
Total		Count	107	316	568	180	84	1255
		% within Sex	8,5%	25,2%	45,3%	14,3%	6,7%	100,0%

Table 13. shows the results of time spent outdoors during school days. A percentage of 7.3 of the boys and 9.7 of the girls don't play outdoors at all, while 21% of the boys and 29.1% of the girls spend less than an hour a day outdoors. Three to five hours a day are spent outdoors by 7.3% of the boys and 6.1% of the girls. Chi-squared test is 15,392 df=4, p=0,004. The results can be considered statistically significant.

3. Conclusion

The obtained results show that children spend a lot of time in front of the TV during school days. A total of 38.1% of the boys and 34.8% of the girls watch TV from one to three hours a day while 7.2% of the boys and 3.4% of the girls watch it for three to five hours a day. During the weekend, the number of TV viewers increases and children spend more time watching TV. In fact, 27.8% of the boys and 25.7% of the girls watch TV for three to five hours a day, while 14.4% of the boys and 10.1% of the girls watch TV more than five hours a day. Almost a half of the male subjects, a 49.6% of them, own a smartphone, and so does 58.6% of the girls. During school days, 13.5% of the boys and 9.1% of the girls use the smartphone for one to three hours per day, and 4.5% of the boys and 2.5% of the girls use it for three to five hours per day, while during the weekends the number of the boys using the smartphone for one to three hours a day is 18% and the number of the girls is 15.3%. Also, 5.7% of the boys and 5.1% of the girls uses the smartphone for three to five hours per day during the weekend. A total of 3.7% of the boys and 1.8% of the girls use the smartphone for more than five hours during school days, while for such usage during the weekend the number goes to 6% of the boys and 2.2% of the girls. It is interesting how the time spent in front of the TV and the smartphones increases during the weekend, when it would be ideal for children to spend their free time outdoors and not in front of a screen. A total of 44.2% of the boys and 36.9% of the girls never discussed the rules of usage of smartphones with their parents, which could lead to abuse of the device, such as usage of tools and social networks that are inadequate for their age, tools that provide chatting and picture sharing possibilities, possible violence among peers and playing games designed for an older population and therefore are inadequate for children. A total of 54.7% of the boys and 65.4% of the girls use the smartphone for playing games, which means the usage of smartphones for internet browsing, picture taking and social networking is increasing and could therefore lead to a decreasing number of computer and laptop users in favor of smartphone users who can accesses all information "form their pocket". During class, 1.6% of the boys and 1.8% of the girls use their smartphone for personal reasons and without knowledge of the teachers. We suggest that the phones are turned off and put aside during class, only to be used as part of the curriculum, under the supervision of teachers. During school days, 4.6% of the boys and 1.9% of the girls use the computer for three to five hours a day and 3% of the boys and 1.4% of the girls use it for more than five hours a day. The numbers increase during the weekend, leading to 8.6% of the boys and 5.1% of the girls who use the computer for one to three hours a day, and 8.5% of the boys and 1.9% of the girls who use the computer for more than five hours a day. During school days, 7.3% of the boys and 9.7% of the girls don't play outdoors, while 21% of the boys and 29% of the girls play outdoors for less than an hour.

Considered all said above we think it is urgent to find a way to motivate children to limit the time they spend in front of ICT devices. There are nine reasons why ICT devices should not been given to children: faster growth of the brain, slower development, chronic obesity, sleep disorders, mental illness, aggression, digital dementia, addiction and radiation [10].

While using ICT devices, there is no eye accommodation which is important for a proper development of the brain [11]. This, together with all the other lacks of early stimulation, derived from the

sedentary lifestyle, is the core of the challenge that the NTC learning system is pursuing: a new methodology of teaching, which is interesting at least as the ICT devices. Through motoric activities, which are always associated with some cognitive tasks, the NTC learning system has managed to give a new way of approaching schooling. Our researches conducted in March 2017 have shown that the system works better with the adults than the traditional one. We started a research that will give the answer to our hypothesis that it will also work better with children.

It would be interesting discover which is the percentage of parents who are familiar with the online game ranking system and if they know how to, in accordance with a professional recommendation, prevent possible media and technology addictions and direct their children towards different activities, games, playing with their peers, inventing new games (or reviving the old, traditional ones) that not only stimulate their creativity and friendships but have an important role in their healthy growth and development.

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