Evaluation of the screen time children spend daily for using digital technology

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Abstract: *The survey "Evaluation of the screen time our children spend daily for using digital technology" was conducted as part of a master thesis in Social Entrepreneurship at the American University in Bulgaria in March 2023. Analysis of the data for "time spent" by children on interacting with electronic devices is increasing alongside with the grow of the child and is directly influenced by entering formal education system. Acceptable "time spent" for the majority of parents is 1-2 hours in age group 5 to 9 (pre- and primary school) and 3-5 hours for 10 and above (when children enter the phase of adolescence). The parental that digital technologies are having positive impact over children (educational, social and digital skills development) is growing with the child growing up, and for the age group 10 -14 (secondary school) and 14 and above (gymnasium) it is dominating among parents.*
KEYWORDS*: ELECTRONIC DEVICES, DIGITAL TECHNOLOGIES, TIME SPENT, EDUCATION, CHILDREN*

1. Introduction

The accelerated implementation of information and communication technologies in all areas of public development requires in-depth studies of its effects at both national and global level. As education is one of the sectors most influenced by these trends, the need for systematic research on the application of digital technologies in the educational process is becoming increasingly apparent nowadays, [1]. Over the last years the usage of mobile devices has increased among the population. The trends 2016-2021 from the National Statistical Institute in Bulgaria show significant growth of mobile (smart) phones as a preferred device for internet access, growing from 42.1% to 71.8%, [2]. Among the most important triggers in the usage of mobile devices was the COVID-19 pandemic, which caused a full closure of schools in 2020 (second semester). Moving to online education forced students in all Bulgarian schools to use an electronic device, connected to the internet, to be able to participate in the educational process. According to a survey, conducted in a partnership between Deloitte and IPSOS, on behalf of the European Commission almost 90% of students in Bulgarian schools have access to a device – either laptop, tablet, or smart phone. [3]. And while this research is measuring usage at least once per week, during the lockdown 90% of students were engaged 5 days per week in the online learning process, without measuring the time spent for homework preparation as per Ministry of Education report. [4]. Still there are not many studies conducted to measure the impact of mass technology on daily use of students and how the habits are evolving from using connected devices for learning purposes to using them for entertainment purposes and what is the impact. Research, aiming to disclose parents' view on electronic time spent by their kids was conducted as part of a master thesis in Social Entrepreneurship at the American University in Bulgaria in 2023 and some key findings are presented.

2. The Research Backgrounds

The impact of digital media usage and its impact on development of young people is a topic, becoming more and more in focus for many researchers in the past 10 years, marking the "explosion" of social media, interactive communication platforms, and electronic games. Focus is primarily on adolescence, which is defined as the transition period between childhood and adulthood (approximately ages 10–22 years), where parental influence decreases and peers become more important. Extensive overview of research documents on adolescence neural systems confirms they are still underdeveloped and undergoing significant changes while growing up, and may contribute to sensitivity to online rejection, acceptance, peer influence, and emotion-loaded interactions in media-environments. [5]

Recently published paper examined the associations between adolescent digital media use and mental health by comparing adolescents enrolled in 8th, 10th, and 12th grade in the United States in 2018 (pre-pandemic) and adolescents in 2020 (during COVID-19). The data comparison shows that there were significant differences by year in adolescent hopelessness, with adolescents reporting less hopelessness in 2020 than in 2018. And there are no significant differences between adolescent happiness and loneliness. Adolescents in 2020 spent significantly more time watching movies and video chatting, but less time texting and on social media than adolescents in 2018. In practice results of the survey did not confirm the initial hypothesis of the researchers: adolescents in 2020 will have significantly worse mental health (lower happiness, higher hopelessness, and loneliness) than adolescents in 2018. [6]

Recent survey, conducted in Latvia among basic schools and secondary schools finds out that screen time during COVID-19 pandemic crisis has increased. Together with the online formal learning process, implemented due to lockdown and schools' closure, the time spent online increased with homework preparation, totally 46,2% of students report they spent an additional 3-4 hours. There is no big change observed in the physical activities' times spent during pandemic. Still the majority of students in Latvia prefer to study on-line instead of face-to-face learning, although well-being for many students during COVID-19 pandemic crisis has decreased. It seems that in future on-line studies will become more popular in comparison to face-to-face studies is the conclusion of the survey. [7]

More and more researchers are focusing on different approaches to overcome the negative implications of electronic screen syndrome among teenagers. A recent study, implemented in two governmental schools in Cairo, Egypt among 13-15 years aged students. Specially designed digital detox program with four sessions was applied to the focus group of students in their schools in separate classes. The results before and after the program implementation show that the percentage of students with high and moderate electronic screen addiction has decreased, while the percentage of students with low electronic screen addiction has increased. The main outcome of the study is that preventative programs must be developed for high school students, and awareness should be raised about electronic screen addictions and their negative consequences. [8]

A cross-sectional study among students in Saudi Arabia Universities assess the online learning experiences and how it is related to headaches associated with screen exposure time spent. Results show that students faced many challenges with online learning that affected their communication efficiency as well as high prevalence of headache (65.72%) and a high screen exposure time among the studied students (52.69%). Increased screen time exposure is linked with increased headache and migraine reporting among students. [9]

3. Data and Methodology

The survey "Evaluation of the screen time our children spend daily for using digital technology" was implemented in March 2023 among parents of children and school students by using an online survey platform (n=304).

Four age groups of surveyed students were outlined, based on learning levels of Bulgarian education system: 1-4 (kindergarten), 5-9 (pre- and primary school), 10-14 (secondary school), above 14 (gymnasium). The goal of the survey is to understand the third party (parents) evaluation of screen time spent of their children and the respective implications further. For the questionary was used an online survey platform and the results were analyzed using SPSS (Statistical Package for the Social Sciences) software for statistical analysis.

4. Results and Discussion

Table 1 presents the data for daily interaction of the children with electronic devices (computer, mobile phone, tablet, console or other) – per hours and per age group, (Cramer's V = 0,371, Approximate Sig.= 0,009).

Table 1 *How much time does your child spend in front of a computer, mobile phone, tablet, console or other electronic device per day by age?*

	I can't say	spends no time	1	1-2	3-5	above 5
1-4		28.6%	**37.1%**	22.9%	11.4%	0,0%
5-9	6.9%	4.6%	20.7%	**44.8%**	19.5%	3.4%
10-14	0.7%	0.7%	6.7%	31.9%	**45.2%**	14.8%
above 14	6.3%	0.0%	6.3%	16.7%	**41.7%**	29.2%
Total	3.3%	*4.9%*	14.1%	32.1%	**33.4%**	12.1%

Only 3.3% of the survey adults cannot provide answers about the time spent on interaction with electronic devices of their kids. It is clear that adults have a very good understanding and visibility on the daily e-activities of children. The time spent in front of the screen depends to a very large extent on the age group in which the children are. And while for children between 1 and 4 years the largest group is the one that spends up to 1 hour per day (37.1%), followed by the one that includes children who have no interaction with digital screens at all, for children in the next age group - from 5 to 9 years, already the largest group spends in front of a digital screen between 1 and 2 hours (44.8%). This change has a logical explanation: in the age group 5-9 children are part of the formal education system and digital technologies are implemented in the learning process.

As children grow up - the time spent in front of digital screens increases. For age groups10 to 14 almost half are spending 3 to 5 hours (45.2%) and results are pretty much close to the age group 14 and above. If we apply the standard 24-hours' time split: 8 hours of sleeping and 6 hours engaged in formal education in schools, more than one third of remaining time (10 hours) is spent in front of electronic devices. For age group 14 and above almost one third of children (29.2%) spent more than 5 hours, or at least half of the "free" time during the day. In total the biggest group is 3-5 hours spent per day (34.8%), . Results show the logical trend – as a child is growing up the time spent interacting with electronic devices is growing, (Cramer's V = 0,371, Approximate Sig.= 0,009). It is important to understand how parental engagement facilitates this trend.

Table 2 represents the results showing the effect of using screen time control software and/or the availability of formal rules for using electronic devices. Results are presented by time spent for all children, and not by age group. Table 2 combines answers given by parents to the following questions: "*Do you have usage and screen time family policies to regulate the amount of time and content your child has access to and are they being followed?"* and "*Do you use parental control software on your child's most used electronic devices?"*, (Cramer's V = 0,345, Approximate Sig.= 0,009).

Table 2 *Effect of using screen time control software and/or the availability of formal rules for using electronic devices.*

software	rules	I can't say	spends no time	1	1-2	3-5	above 5
Yes	strict	2,9%	2,9%	25,7%	42,9%	25,6%	0.0%
No	**strict**	**4,5%**	**22,7%**	**50,0%**	**18,2%**	**2,3%**	**2,3%**
Yes	semi-strict	1,6%	0.0%	11,3%	35,5%	38,7%	12,9%
No	**semi-strict**	**2,5%**	**2,5%**	**10,0%**	**52,5%**	**22,5%**	**10,0%**
Yes	non-strict	0.0%	0.0%	0.0%	12,0%	68,0%	20,0%
No	non-strict	**0.0%**	**0.0%**	**0.0%**	**37,1%**	**34,3%**	**28,6%**
Yes	no rules	20,0%	0.0%	0.0%	30,0%	40,0%	10,0%
No	**no rules**	**6,1%**	**2,0%**	**2,0%**	**26,5%**	**53,1%**	**10,2%**
Yes	total	3,0%	0,8%	12,1%	32,6%	40,9%	10,6%
No	**total**	**3,5%**	**8,1%**	**15,6%**	**31,8%**	**27,7%**	**13,3%**

68% of children spend 3-5 hours interacting with electronic screens in families that have implemented parental control software, and at the same time there are no strict rules to regulate the screen time spent. More than half of students (53.1%) are in families where parents neither implement any software control, nor there are any rules. Looking at the result for children, spending between 1 and 2 hours 52.5% are in families, where there is no software control and rules are semi-strict. While in the scenario where there is software control and strict rules in families, 42.9% of children interact with electronic screens. Comparing those results with the total results for software control availability in families shows that as the time spent is growing, the percentage of parents, implementing such measures is also growing. So, the importance of rules available is the key factor to control the time spent. As for example having software control implemented, but not strict rules most probably means the capacity of software is not used. It is confirmed also by the results in the group of parents, reporting they can't say how much time their kids spent with electronic screens, while at the same time there is a software control implemented and no rules available (20%): most probably software is available, but never used or monitored. Strict rules are most important for the group of children, spending up to 1 hour interacting with electronic devices, and this group is dominated by children up to 9 years old. While children from families with no strict rules are the biggest portion of the group, defined as spending more than 5 hours daily (20% and 28.6%). Those results are also connected with the analysis of parents' knowledge about the effects of screen time exposure of children.

Table 3 shows the results of the answers to the question: *"As a parent, do you have enough information about the effects of "Screen Time" - the benefits and disadvantages?"* in relation to the total time spent in front of electronic devices, (Cramer's V = 0,243, Approximate Sig.= 0**,**000).

Table 3 *As a parent, do you have enough information about the effects of "Screen Time" - the benefits and disadvantages?*

	I can't say	spends no time	1	1-2	3-5	above 5
No	0.0%	3,6%	0.0%	25,0%	**60,7%**	10,7%
Maybe	1,2%	2,4%	2,4%	**40,2%**	**40,2%**	13,4%
Yes	4,6%	6,2%	21,0%	**29,7%**	26,7%	11,8%
Total	3,3%	4,9%	14,1%	32,1%	33,4%	12,1%

The biggest portion of children (60.7%) spend 3 to 5 hours daily and live in families, where parents confirm they don't have enough information, while in the same group twice less (26.7%) are the ones whose parents report they have enough information. In the group of children spending between 1 and 2 hours daily 40.2% and 29.7% are from families, where parents consider they are maybe or fully aware about the effects of "screen time". If those results are compared with the above-mentioned data from Table 2, we see the direct link between the growth of age, the growth of "time spent" and the level of parents' confidence in their knowledge. One of the

possible explanations is that as kids grow up more and more digital tools are deployed in their hands – from using parents device in early age (1-4), having own mobile phone (5-9), adding tablet computer (10-14) and in 14+ group exposure to gaming (through gaming device). And as parents usually don't use some of those technological devices at all or use them in a different way than youngsters, it is difficult to stay informed up to date.

Table 4 presents the data from a closed question to parents: "*Do you think that the excessive use of electronic devices and increased time in the digital space?*" and 4 optional answers, (Cramer's V = 0,167, Approximate Sig.= 0,042).

Table 4 *How the excessive use of electronic devices and increased time in the digital space impact a child?*

	I can't say	spends no time	1	1-2	3-5	above 5
Harm the child	3.3%	7.8%	18.3 %	**30.6%**	28.3%	11.7%
Neither harmful nor beneficial	0.0%	1.6%	4.8%	**41.9%**	**40.3%**	11.3%
Benefit the learning process and social skills	3.8%	0.0%	7.7%	26.9%	**46.2%**	15.4%
Useful for the development of digital skills	8.1%	0.0%	13.5 %	27.0%	**37.8%**	13.5%
Total	3.3%	4.9%	14.1 %	32.1%	33.4%	12.1%

It is not strange that 0% of parents, whose children are not spending time with electronic devices, consider there is no benefit, as the majority of kids in this group are 1 to 4 years old (28.6%). With the increase of time spent and kids growing more and more parents consider excessive use of devices harmful, with peak (30.6) in the group of 1-2 hours spent. Also peak in this group are parents of 41.9% of children, who do not have neither positive, nor negative opinion. And we see that for approximately the same number of parents in this group benefits are related to learning process and social skills (26.9%) or development of digital skills (27%). This could be explained with the level of exposure of children to digital technologies when they enter the educational system, and start using electronic devices not just for entertainment, but also for learning. This conclusion is supported by data from the next group: spending 3-5 hours daily, dominated by children in age groups 10-14 and 14 and above. The % of parents without positive or negative opinion is at the same level as previous group (40.3%), but the % of parents with positive opinion is increasing significantly, with peak of all surveyed groups: 46.2% of children are coming from families, where parents think the excessive use of electronic devices and increased time in the digital space is beneficial for learning process and social skills, as well another 37.8% of children live in families, considering it is it is useful for development of their digital skills. So, if we connect results of those cross-section data with the ones presented in Table 2 – the control over "time spent" either thru special software implementation or formal rules in place is not of importance for parents as majority believe time spent with technologies is overall beneficial for their children.

5. Conclusion

There are few important conclusions made from the data analysis:

- "Time spent" by children on interacting with electronic devices is increasing alongside with the grow of the child and is directly influenced by entering formal education system;
- What the majority of parents consider as "acceptable time spent" is 1-2 hours in age group 5 to 9 (pre- and primary school), 3-5 hours for 10 and above (when children enter the phase of adolescence) while the bigger number of parents, participated the research consider the kids spend too much time
- The parental belief that digital technologies have positive impact on children (educational, social, and digital skills development) is growing with the child growing up, and for the age group 10 -14 (secondary school) and 14 and above (gymnasium) it is dominating among parents.

Data collected in the survey "Evaluation of the screen time our children spend daily for using digital technology" are not sufficient to differentiate how electronic devices are used and in what proportion between serving educational needs and entertainment needs. This is how the research could be extended further, adding detailed data and analysis.

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