Technology Use in Early Childhood

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Abstract. Modern childhood is closely connected to early use of technology such as Internet, especially Youtube, and different apps for smartphones and tablets. Recent researches revealed quite early start of technology use: children at the age of seven already use technology at everyday basis, and up to three hours a day. At the same time, parents use the same technologies parallel with their children, which parents consider as safety factor, i.e. parents think that their presence in the room during child being online makes their children safe from online threats. To find out how parents and preschool teachers perceive technology use in early childhood, for children up to seven years of age, online survey was conducted during November and December 2018 in Croatia. Overall 401 parents and preschool teachers from five Croatian counties participated in this survey. Results show that parents and preschool teachers consider technology in early education to be more useful and offering more potentials for children academic and social life, than it is a threat for their development. When they argue about potentials, they say technology can help a child in acquiring foreign language, acquiring competencies for appropriate use of technologies later in life, academic preparation for the school entrance, and knowledge about immediate surroundings. Majority of the parents and preschool teachers (85 %) would recommend a technology use not prior the third year of life, however, some parents and preschool teachers would consider a technology use for children in their first and second year of life. Majority of participants recommend one hour a day for technology in home, yet for several parents and teachers, even two or three hours a day would be appropriate for children under seven. These results reveal that parents and teachers can recognize benefits of technology in early education. Yet, they have to get information about other impacts of use of technology in early childhood, including its impact on language development and social skills in toddlers.

Keywords: early childhood, parents, preschool teachers, technology, benefits and risks

1. Introduction

Modern childhood is closely connected to early use of technology, as it is impossible to scrutinize contemporary childhood without technology and media. In the past 10 years, technology has increasingly been present in scientific literature, but also technology has become a part of the landscape and contexts of children's everyday lives (Jones and Park, 2015). Track-researches in European Union and United States of America (ENISA, 2014; CSM, 2017) have proven that technology is increasingly present in early years – even children under age of two are given tablets, mobile/smart-phones and different devices such as iPads for up to two hours a day. On the other hand, more "traditional" devices such as DVDs, television and video games/consoles are decreasing in everyday usage (Hipp, Gerhardstein, Zimmermann et al., 2017; CSM, 2017), suggesting that parents are oriented towards mobility and portable devices that can be used in different spaces and contexts. As far as socio-economic status is concerned, families with lower incomes have limited access to internet, yet the ownership of mobile devices such as smart phones or tablets is increasing, and according to CSM (2017) 61 % of families with low incomes have at least one portable device which is shared between parents and children, and children spent more than two hours per day on these devices. Children in middle income families spent similar amount of time on devices, and children in high-income families, as this report suggests, spent much lower amount of time on portable devices, less than hour and a half. The difference is still present in content – lower income families are restricted to online educational contents due to restricted access to internet (CSM, 2017), suggesting that quality of available contents should also be involved in the researches. Both European and USA track-research (CSM, 2017; ENISA, 2014) revealed continuous increasing in time-consuming of internet for young children under five years. The first encounter with media is in infancy, around four month of child's life, and its often TV screen involved (Reid Chassiakos, Radesky and Christakis, 2016). In their survey, 92 % of children under age of one have been introduced to tablets and smartphones. The overall time spent on screen is rapidly increasing during the first five years of life, so children under 7 years of age averagely spent around 7 hours per day on different electronic devices (American Academy of Pediatrics as cited in Jones and Park, 2015). This kind of time management slowly capturing interest of research community, shifting focus from researching adolescents and high-school users to identifying benefits and risks of online early childhoods. As risk of use of technology in early childhood, under age of seven, parents articulate possibility of online grooming and exposure to violence, while potential harms for child's development such as impact on cognitive abilities, language and social skills are not considered as risk factors by parents (CSM, 2017). On contrary, 83 % of parents in CSM 2017 survey claimed that there are more benefits of technology usage in early childhood, than risks. Authors Hipp, Gerhardstein, Zimmermann et al. (2017) see fewer benefits of technology in early years. They say that technology doesn't allow several important things for learning in early years, such as transfers from screen to reality, tactile input, and imitation which is a foundation for later learning in life. Instead of technology and screens, children under age of three should be given an opportunity to experience real-world interaction, i.e. to learn

about their immediate surroundings by participation and direct engagement with parents in situations of scaffolding (ibid.). According to track-research conducted in USA in 2017 by Common Sense Media, parents have mixed feelings about technology in early childhood. For instance, majority of parents agreed that technology benefits children in their development, especially on children's creativity, social skills and ability to maintain attention/focus. But, at the same time, parents are concerned about online violence and children's physical activity – parents are aware that screens can't compensate physical activities. Parents' views vary across the chronological age of children – parents of children under two years claim that technology benefits child's social skills, ability to focus and behavior in generally, parents of children aged three to six put emphasis on creativity, and parents of children aged six to eight see major benefits on creativity and social skills, while all three groups of parents agree that major contribution of technology in early years is learning (ibid.). Interesting, in this survey, lower income families reported higher level of interest for quality of apps and recommendations about children's media use, than parents from high-income families and higher level of education. This founding is similar to findings of Velki and Romstein (2019) which showed that higher educated internet adult users more often practice risk behaviors (such as revealing passwords and account information to third parties, opening different web sites without adequate security programs etc.), due to their theoretical knowledge about threats – they think that their knowledge about threats is enough to protect them, which is a paradox.

When preschool teachers and educators were asked about benefits and risks of technology in early childhood, their major concern was inappropriate online content and sexual abuse, similarly to parents' concerns (Jones and Park, 2015). As far as developmental risks are concerned, preschool teachers mention lack of creativity, and lower socio-emotional skills as major threats of technology in early years (ibid.). Also, problems deriving from technology in early years are obesity, poorer ability to concentrate on a task, and lack of adequate self-regulation skills needed during the interaction with peers and others in everyday life (Radesky, Silverstein, Zuckerman et al., 2014), suggesting that technology in early education could be a public health issue if not adequately managed. As major benefits of technology in early years, preschool teachers mention literacy acquisition and basic academic skills such as writing and spelling (Radesky, Silverstein, Zuckerman et al., 2014). They perceive technology in early childhood as helpful and useful, only if it is carefully used for learning purpose, and if closely monitored by caregivers (Blackwell, Lauricella and Wartella, 2014; Lauricella, Blackweel and Wartella, 2017). As Guernsey (2017) remarked, preschool teachers are more than parents concerned with content and context, suggesting that technology itself isn't much of a help without structure and adequate approach. Although technology in education is supported by policy makers, it is less present in early childhood education (Blackwell, Lauricella and Wartella, 2014), indicating that policies and recommendation for technology in education should be offered in more systematic way, connecting early education with other levels of education. This is needed because children acquire behavioral patterns in early years, and adequate approach to technology could have a preventive effect for reducing risk online behaviors in adulthood. Also, adults have an impact on children use of technology, so it is

important that policy makers, researchers, preschool teachers and parents closely collaborate on this issue, and to scrutinize risks and benefits of technology in early years.

2. Method

2.1. Goal and purpose of survey

The main goal and purpose of this survey was to identify benefits of technology in early childhood perceived by parents and preschool teachers.

2.2. Research question

In this survey, the research question was: How parents and preschool teachers perceive technology in early childhood, i.e. what are the main benefits of technology in early childhood perceived by parents and preschool teachers?

2.3. Participants

Overall 401 parents and preschool teachers from five Croatian counties participated in this survey: 212 parents (53.6 %) and 189 preschool teachers (47.1 %), both females (95 %) and males (5 %). Majority of participants were aged 21 to 30 (40.6 %), and 31 to 40 (31.2 %). As far as their educational level is concerned, majority of participants (65.3 %) reported high-school as their formal educational level. Majority of parents have one child under age of 7 in the family (87.2 %).

2.4. Questionnaire

For this purpose, online questionnaire was offered via google docs platform. Questionnaire consistent of three major parts: (1) general information about participants (their social role – parents or preschool teachers, their age, level of education, number of children in the family), (2) questions about benefits of technology in early childhood, and (3) habits of using technology in everyday life.

2.5. Data collection

Questionnaire was distributed through social media network, assuming that parents and preschool teachers who spent some amount of time online, would see the questionnaire and would participate in this survey. Data were collected during November and December 2018.

2.6. Data analysis

Due to qualitative aspects of survey, a mixed method approach was considered as suitable for data analysis.

3. Results and interpretation

3.1. Benefits of technology in early childhood

Table 1. Benefits of technology perceived by parents and preschool teachers.

Benefits	Parents (%)	Preschool teachers (%)
Learning foreign language	87.2	79.3
Learning how to use technology	61.3	60.8
Communication with others	15.1	9.5
Learning about immediate surroundings	36.3	13.2
Achieving school readiness (enhancing academic skills)	49.5	26.4

Parents and preschool teachers were given an opportunity to assess major benefits of technology in early childhood. They were asked to name several benefits in accordance to personal estimation of long-term positive outcomes for child's life and development. Both, parents and teachers have similar opinions about learning foreign language and learning how to use technology, yet they differ in benefits for communication with others, learning about immediate surroundings and achieving school readiness: preschool teachers see fewer benefits in those areas than parents. Similarities in assessing benefits on learning foreign language and how to use technology is logical, i.e. technology use can be learned only through direct experience, and foreign languages are becoming available through technology and media. Similar founding was presented by Radesky, Silverstein, Zuckerman et al. in 2014, and Jones and Park in 2015. In their researches, preschool teachers perceive major benefits in academic skills, especially in early literacy. The differences in this survey could be a result of perception of learning – preschool teachers are more aware than parents that communication and learning about immediate surroundings should be conducted through live, on-site communication, involving reciprocity and adequate feedback. Also, achieving school readiness involves different processes, so preschool teachers perceive technology less needed for this area of child's life, i.e. preschool teachers are aware that school readiness is multidimensional phenomenon and technology cannot completely meet all of the criteria needed. These differences could be interpreted within the levels of formal education because preschool teachers during their study learn on more comprehensive level about learning in early years, and parents don't have that kind of knowledge.

Table 2. Suitable technological platforms for achieving benefits.

Platforms	Parents (%)	Preschool teachers (%)
Youtube	32.1	13.2
Internet (in general)	53.3	51.8
Social media (Facebook, Tweeter)	0.2	–
Apps for smart-phones	49.5	46.6
Online games	14.2	–
Console games (Play Station, Nintendo etc.)	9.4	–

As most suitable platforms for achieving benefits, according to parents are internet, apps for smart-phones and Youtube, while preschool teachers prefer apps for smart-phones and internet. Parents even suggest social media, online games and console games as suitable technology platforms for early learning. Several authors (Blackwell, Lauricella, Wartella, 2014; Jones and Park, 2015) suggested that Youtube is adequate media, as reported by parents, because children can access quality educational content such as Sesame street. However, there are no research on social media in early childhood, which could be interesting to question because there are different social medias available. Also, it would be interesting to see how parents use it particularly in educational purpose, as here suggested.

Table 3. Suitable child's age for introduction of technology.

Child's age	Parents (%)	Preschool teachers (%)
During 1st year of life	0.5	–
During 2nd year of life	16.5	–
During 3rd year of life	54.2	47.1
After 3rd year of life or later	28.8	52.9

Preschool teachers and parents differ in perception of suitable age for introducing technology into child's life. While several parents consider 1st and 2nd year of life as age appropriate time for technology introduction, preschool teachers wouldn't recommend it before child's 3rd birthday. In Croatia there aren't any formal recommendations by experts, but American Academy of Pediatrics (2016) advice parents that children under age of 2 don't need technology and media to learn. Rather, children under two should get involved in the hands-on activities to develop adequate skills, and children aged 3 to 5 can get access to media and technology, but only if closely supervised by parents and professionals, and if content is educative and high-quality, such as Sesame Street (AAP, 2016). Differences in perception between parents and preschool teachers in this survey could be derived from formal education of preschool teachers within which they learn about child's development on scientific level, involving researches across disciplines covering speech, motor development, cognitive development etc.

3.2. Habits of using technology in everyday life

Table 4. Benefits of technology for parents and preschool teachers.

Benefits	Parents (%)	Preschool teachers (%)
Connecting with (other) parents	75.4	87.3
Connecting with colleagues and co-workers/ doing work from home	29.7	69.8
Getting an opportunity to conduct house work (cleaning, cooking, ironing etc.)	21.2	–
Learning about technology together with children	54.2	–

Both, parents and preschool teachers use technology for connecting with each other. Parents seek opportunities to exchange experiences with other parents, forming virtual peer-network which is inherent part of modern parenthood (Romstein, Despot and Zamečnik, 2016). Parents sometimes use technology as support during house work, for keeping children occupied, while they are cooking, cleaning etc. This practice is present amongst parents for quite some time – they use technology as some sort of virtual nanny while they are conducting daily routines in the households (Babić, Irović and Romstein, 2007). The main reason for that could be absence of support for parents, i.e. involvement of grandparents and unequal distribution of daily routines amongst family members (Romstein, Despot and Zamečnik, 2016). The differences could be interpreted in the context of social conditions and social roles indicated in this survey. Although preschool teachers don't use technology as an opportunity to conduct house works, it would be interesting to conduct research with emphasis on their parental roles, which could differ from their professional ones. Also, Croatian kindergarten are suffering from lack of money and majority of kindergarten struggle with basic didactical equipment, leaving technology at margins of educational work. Kindergartens in Croatia don't have tablets, PCs etc. as basic equipment, and majority of kindergartens have problems with internet connection, which could influence teacher's perception about technology use in early education.

Table 5. Amount of time child under 7 should spent with technology.

Time	Parents (%)	Preschool teachers (%)
Up to 30 minutes a day	34.9	54.4
Up to 60 minutes a day	40.1	21.8
From 1 hour to 2 hours a day	19.8	23.8
From 2 to 3 hours a day	4.7	–
More than 3 hours a day	0.5	–

Parents and preschool teachers have different opinions when it comes to time and length of use of technology in early years. In generally, preschool teachers tend to shorter amount of time, and perceiving the maximum of 1 to 2 hours as beneficial for child development. Parents are more likely to allow children greater amount

of time, some parents even more than three hours a day. American Academy of Pediatrics (2016) suggested that overall amount of time with technology at hands contributes, not just to problems in developmental status of a child, but also to health issues such as quality of night sleep and obesity. Therefore, they are recommending that parents and professionals educate themselves about educative potentials of technology, and to use it only for achieving educational goals, when identified. According to gathered data, preschool teachers are more likely to meet these recommendations, suggesting that formal education of preschool teachers contributed to their perception of benefits and risks of technology in early childhood.

4. Conclusion

This survey showed that Croatia follows global trends in use of technology in early childhood – there are some evidences that technology is offered to children during the first two years of life, with tendency to increase time of child's involvement with technology up to three hours a day. Similar founding has presented AAP (2016) and recommended parents to reconsider a practice of reducing on-screen activities for infants and toddlers. Founding suggests that young families in Croatia have to some extent *laissez faire* approach to technology, especially when it comes to scrutinizing adequate media for toddlers, and benefits of technology for child's development. The New Age Parents do their everyday activities online, including co-working and performing working tasks as part of their professional life. Contemporary life is fulfilled with technology, and children are introduced to technology early in life. Some researchers (Hipp, Gerhardstein, Zimmermann et al., 2017; Guernsey, 2017; Lauricella, Blackwell and Wartella, 2017) suggested that benefits of technology depend on quality of everyday interaction in immediate surroundings. So, if child is provided with enough real life experiences, risks of technology in early childhood are fewer. Therefore, parents and adults should provide balance between on-screen and on-hands activities in early childhood. In that task, collaboration between academic community, policy makers, educational professionals and parents is essential.

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Uporaba tehnologije u ranom djetinjstvu

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Sažetak. Moderno djetinjstvo je usko povezano s uporabom tehnologije kao što je primjerice Internet, posebice Youtube, te različite aplikacije za pametne telefone i tablete. Recentna istraživanja ukazuju kako se tehnologija u svakodnevnom životu djece pojavljuje već u ranom djetinjstvu: djeca u dobi od 7 godina svakodnevno rabe tehnologiju, do tri sata dnevno. Za to vrijeme roditelji također koriste tehnologiju, paralelno sa svojom djecom, što smatraju čimbenikom zaštite, tj. roditelji smatraju kako njihova fizička prisutnost u istoj prostoriji s djetetom koje je online smanjuje rizik od online zlostavljanja. Kako bi se saznalo više o tome kako odgojitelji i roditelji vide uporabu tehnologije u ranom djetinjstvu, tijekom studenog i prosinca 2018. u Republici Hrvatskoj je provedeno online ispitivanje. Ukupno 401 roditelj i odgojitelj iz pet županija su sudjelovali u ispitivanju. Rezultati pokazuju kako roditelji i odgojitelji smatraju da tehnologija u ranom djetinjstvu donosi djetetu koristi za razvoj akademskih i socijalnih vještina. Pojašnjavaju kako tehnologija može pomoći djetetu kod usvajanja stranog jezika, jačanju kompetencija uporabe tehnologije u kasnijem životu, te ju vide kao pomoć kod stjecanja znanja o neposrednom okruženju koja su potrebna kod polaska u osnovnu školu. Većina roditelja i odgojitelja (85 %) ne preporučuju uporabu tehnologije prije 3. godine, iako neki roditelji i odgojitelji smatraju kako je druga godina života najbolja za uvođenje tehnologije u djetetov svijet. Većina odraslih smatra kako je za optimalne učinke uporabe tehnologije dovoljan jedan sat dnevno, dok nekoliko roditelja i odgojitelja navode kako su dva ili tri sata uporabe tehnologije poželjne za djecu ispod sedam godina. Dobiveni rezultati pokazuju kako roditelji i odgojitelji prepoznaju potencijale tehnologije u ranom djetinjstvu, no isto tako da ih je potrebno dodatno informirati o utjecajima tehnologije na razvoj djece, posebice o utjecaju tehnologije na jezično-govorni razvoj i socijalne vještine djece rane dobi.

Ključne riječi: rano djetinjstvo, roditelji, odgojitelji, tehnologija, dobrobiti i rizici