

The Impact of the Type of Digital Content on the Communication of Preschool Children

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Abstract

Digital media to which a child is exposed can have both positive and negative effects on the process of language acquisition and the development of communication skills, depending on the type of content the child consumes. Therefore, the aim of our research was to examine the impact of the type of digital content on the communication of preschool children, whereby we divided the mentioned content into educational and entertaining categories. The sample consisted of 200 preschool children aged 48, 54, and 60 months, of both genders. The standardized instrument Ages & Stages Questionnaires (ASQ-3), was used to assess different developmental domains in children aged from one month to 66 months. The study was conducted in preschool institutions in Bosnia and Herzegovina during February and March 2024. In all examined age groups, cartoons were the most prevalent type of digital content the children were exposed to, while educational content ranked second. Our results showed a significant difference between the two groups of children divided according to the type of digital content. Children exposed to educational content achieved higher scores on the communication scale compared to those who watched entertaining content. Children who consume educational content achieve better results in the developmental domain of communication compared to children who watch entertaining content, highlighting the importance of the type of digital content children are exposed to. These findings provide an important basis for parents, educators, and various professionals in the field of early childhood development, emphasizing the need for a conscious and responsible approach to the use of digital media to support adequate communication development.

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Introduction

Due to the development of science and technology, as well as the widespread use of electronic devices, digital media and screens have increasingly become an integral part of children's everyday lives (Muppalla et al., 2023). Over the past two decades, there has been a continuous increase in the amount of time children spend in front of screens, along with a simultaneous decrease in the age at which they are first exposed to digital content (Byrne et al., 2021). While in the past children were most commonly exposed to television content within the home environment, over time the types of screens they are exposed to have changed. Today, children have access to modern devices such as computers, mobile phones, and touchscreens (Massaroni et al., 2023). Accordingly, the term "screen time" is increasingly used in scientific and professional literature to denote the total amount of time spent in front of screens—whether watching television, using a computer, or a mobile phone (WHO, 2019).

The latest recommendations from the World Health Organization (WHO, 2019) focus on sedentary screen time, defined as time spent in passive use of screens (television, computer, mobile phone). This definition excludes active screen time—that is, time spent playing digital games that require physical activity or movement. Studies show that preschool children spend more time in front of screens than is recommended for their age, which is inconsistent with WHO guidelines concerning sedentary screen time for children from birth to five years of age (Li et al., 2020; Dennison et al., 2002; Shirley & Kumar, 2019; Barnes et al., 2016). According to WHO guidelines, children under the age of two should not be exposed to screens at all, while for children aged two years, screen time should not exceed one hour per day (including watching television and playing computer games). The same recommendation applies to children aged three to five years. Research by the Canadian Paediatric Society found that only 15% of preschool children comply with the recommendation of limiting screen time to one hour per day, highlighting the increasing prevalence of digital devices among children aged three to five years (Barnes et al., 2016).

Early exposure of children to screens has prompted numerous scientists and researchers to investigate the effects of prolonged screen time on overall and specific aspects of child development, with most studies focusing on speech and language development (Christakis et al., 2009; Madigan et al., 2019; Singh et al., 2021; Byeon & Hong, 2015; Chonchiaya & Pruksananonda, 2008; Duch et al., 2013; Kerai et al., 2022). In addition to examining the relationship between language comprehension and production and screen exposure, researchers have explored the influence of screen type and the quality or type of digital content children are exposed to. Watching educational television content can be significantly associated with the development of expressive vocabulary (Massaroni et al., 2023). Furthermore, Nathanson and colleagues (Nathanson et al., 2014) emphasize that television viewing can positively affect children's linguistic and cognitive development. Joginder Singh and colleagues (Singh et al., 2021) note that screen type and digital content may have different effects on children's language development. Carefully designed digital content characterized by a slower pace can have positive effects on preschool children (Pappas, 2020), including fostering language learning (Roseberry et al., 2014) and significantly contributing to vocabulary and verbal production development (Linebarger & Walker, 2005).

Digital technologies promote creative development and skill acquisition among children of different ages through numerous applications tailored to their interests, allowing them to

explore areas such as learning foreign languages, connecting words with visual content, and acquiring songs and rhymes in their native and foreign languages (Livaković, 2023). On the other hand, Gasser and Palfrey (Gasser & Palfrey, 2008) point out that children are significantly less capable than adults of assessing the reliability and appropriateness of content and language they are exposed to via digital devices. The authors emphasize that when exposed to inappropriate content, children often encounter incorrect grammar and thematically unsuitable material, which can have negative consequences on their language development. Passive viewing of television programs that differ from the native language and cultural environment, without guidance from an adult explaining what is being watched, leads to difficulties in language acquisition—particularly in learning grammatical constructions, understanding language, and processing sentence order (Massaroni et al., 2023).

All this indicates that content quality has a more significant impact on language development than the duration of screen time itself (Beatty & Egan, 2018; Ruangdaraganon et al., 2009). Attention should therefore be directed toward identifying factors that lead to excessive screen use and providing clear guidelines for parents regarding time, content, technology, and shared activities related to young children's screen time in various cultural settings. Based on the above, the aim of our research was to examine the impact of the type of digital content on the communication of preschool children, dividing such content into educational and entertainment categories.

Methods

Sample

The sample consisted of 200 preschool children aged 48, 54, and 60 months, of both genders. Exclusion criteria included below-average intellectual functioning, significant hearing or vision impairments, and severe motor or physical disabilities. The research was conducted in preschool institutions across Bosnia and Herzegovina during February and March 2024.

Instruments

The study employed the standardized *Ages & Stages Questionnaires (ASQ-3)*, which assesses the development of children aged one month to 66 months. The ASQ-3 screening system consists of 21 questionnaires. Each contains 30 developmental items grouped into five domains: communication, gross motor skills, fine motor skills, problem-solving, and personal-social development. For this research, the subscale related to communication was used. The items in this subscale are specific to the child's age in months, and it was precisely defined which questionnaire was to be administered depending on the child's age. For example, the questionnaire evaluating developmental abilities of 48-month-old children applies to those aged between 45 months and 0 days to 50 months and 30 days. The same principle applies to the remaining 20 questionnaires. For this study, three questionnaires were used—those corresponding to children aged 48, 54, and 60 months. Parents or guardians served as informants for the ASQ-3 screening system. They could respond with *YES* (indicating the child exhibits the described behavior), *SOMETIMES* (indicating occasional behavior), or *NO* (indicating the absence of the behavior). The responses were converted into scores, summed, and compared with established norms. Additionally, a general questionnaire consisting of 25 questions was used. Besides sociodemographic data, it included questions related to screen exposure, based on WHO guidelines and Ministry of Education and Culture recommendations, as well as questions about the types of digital content children were exposed to.

Data Analysis

Data analysis was conducted using SPSS 24.0 (Statistical Package for the Social Sciences for Windows). The normality of the data distribution was tested and found to deviate from normality (Kolmogorov-Smirnov test (K-S=.320; df=200; $p<.001$)). According to this non-parametric statistics were applied. The Kruskal-Wallis test was used to examine group differences, and the Mann-Whitney U test was used for post hoc pairwise comparisons. The standard level of statistical significance was set at $p \leq 0.05$. Data are presented in tables.

Results

Table 1 presents the distribution of participants by gender and age. The gender structure shows equal representation—100 (50%) boys and 100 (50%) girls. Regarding age structure, the sample consisted of 45 children (22.5%) aged 48 months, 66 children (33%) aged 54 months, and 89 children (44.5%) aged 60 months.

Table 1.

Sample structure by gender and age

	<u>Gender</u>				<u>Total</u>	
	<u>Boys</u>		<u>Girls</u>			
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>		
<u>48 months</u>	<u>20</u>	10%	25	12,5%	45	22,5%
<u>54 months</u>	<u>30</u>	15%	36	18%	66	33%
<u>60 months</u>	<u>50</u>	25%	39	19,5%	89	44,5%
Total	100	50%	100	50%	200	100%

Table 2 presents an analysis of the most common types of digital content across different age groups of participants (48, 54, and 60 months). Cartoons were the most frequently viewed type of digital content (81.5%) across all age groups: 60 months (36.5%), 54 months (26%), and 48 months (19%). Educational content was the second most frequently viewed type of digital content, again across all age groups: 60 months (4%), 54 months (5%), and 48 months (2%). Educational content thus accounted for 11% of the total content to which children of different ages were exposed. Games made up 4.5% of the total content, with their proportion increasing with age: 0.5% at 48 months, 1.5% at 54 months, and 2.5% at 60 months. YouTube was the least represented digital content, comprising only 3% of the total distribution among our participants, with a negligible proportion across the different age groups (1% at 48 months, 0.5% at 54 months, and 1.5% at 60 months).

Table 2.

Type of digital content across different age groups of participants

<u>Type of content</u>	<u>Gender</u>						<u>Total</u>	
	<u>48months</u>		<u>54 months</u>		<u>60 months</u>			
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>		
<u>Cartoons</u>	<u>38</u>	<u>19%</u>	<u>52</u>	<u>26%</u>	<u>73</u>	<u>36,5%</u>	<u>163</u>	<u>81,5%</u>
<u>Educational</u>	<u>4</u>	<u>2%</u>	<u>10</u>	<u>5%</u>	<u>8</u>	<u>4%</u>	<u>22</u>	<u>11%</u>
<u>content</u>								
<u>Games</u>	<u>1</u>	<u>0,5%</u>	<u>3</u>	<u>1,5%</u>	<u>5</u>	<u>2,5%</u>	<u>9</u>	<u>4,5%</u>
<u>YouTube</u>	<u>2</u>	<u>1%</u>	<u>1</u>	<u>0,5%</u>	<u>3</u>	<u>1,5%</u>	<u>6</u>	<u>3%</u>
<u>Total</u>	<u>45</u>	<u>22,5%</u>	<u>66</u>	<u>33%</u>	<u>89</u>	<u>44,5%</u>	<u>200</u>	<u>100%</u>

Table 3 presents the differences in participants' scores on the Communication scale depending on the type of digital content to which they were exposed. For the analysis, content was grouped into two categories: educational and entertaining. The entertaining category included cartoons, video games, and YouTube content. To determine differences between groups, the Mann-Whitney U test was applied. The results indicate a statistically significant difference between children who watch educational content and those exposed to entertaining content ($U = 1199.50$; $Z = -3.351$; $p = 0.001$). A higher mean rank was observed in the group of children who watched educational content, suggesting that these children achieved better scores on the Communication scale compared to children who watched entertaining content.

Table 3.

Achievements on the Communication scale according to the type of content they watch

<u>Scale</u>	<u>Content</u>	<u>Med.</u>	<u>Mean rank</u>	<u>Min.</u>	<u>Max.</u>	<u>Man-VitniU test</u>	<u>Z</u>	<u>p</u>
Communication	Entertaining	60,00	96,24	15	60,00	1199,500	-3,351	,001
	Educational	60,00	134,98	30	60,00			

Discussion

Digital media to which children are exposed can have both positive and negative effects on language acquisition, depending on the type of content consumed. The aim of our study was to examine the impact of digital content type on preschool children's communication. Content was grouped into educational and entertainment categories. Entertainment included games, cartoons, and various YouTube entertainment content, while educational content included child-oriented informational programs designed to enhance different developmental domains.

Descriptive analysis showed that cartoons were, as expected, the most common type of digital content among all age groups (48, 54, and 60 months). Educational content ranked second in all groups. Our results revealed a significant difference between children exposed to educational content and those exposed to entertainment content, with the former showing better communication scores. These findings are supported by previous research (Fisch, 2000; Apel & Masterson, 2004; Žderić, 2009; Dore et al., 2020; Pašica & Turza, 2020; Green, 2021; Sušić, 2021; Karani et al., 2022; Jing et al., 2023). Karani et al. (2022) emphasized that excessive and early screen exposure can negatively affect language development, but high-quality educational content can have positive effects. Fisch's Capacity Model (Fisch, 2000) suggests that learning is more effective when children are motivated by a topic, as this increases cognitive resource allocation for content processing. Therefore, a high level of engagement and interest in educational material provides valuable opportunities for knowledge and language development.

Green (2021) notes that subtitles in children's programs often include key words that can help children in early reading stages, while Dore et al. (2020) emphasize that high-quality educational content positively impacts preschoolers' language development. Apel and Masterson (2004) found that language development is more favorable when media content is of high quality—particularly educational cartoons and video games that are well designed and age-appropriate. Such content uses simple language, repeats new words, and links them with images, supporting language acquisition. Programs such as *The Muppet Show*, *Sesame Street*, and *Teletubbies* contained well-designed and child-appropriate linguistic material, positively influencing speech and language development. Similarly, Pašica and Turza (2020) noted that quality children's programs stimulate imagination and enrich language development. Through play inspired by media content, children invent new roles and foster creativity. Exposure to multicultural programs helps children learn foreign languages, understand different cultures, and accept diversity. Žderić (2009) highlighted that television, as one of the most widespread media, not only provides information but also promotes education and expression, contributing to vocabulary, verbal communication, and even shaping gender identity. Sušić (2021) found that preschoolers experience both positive and negative aspects of digital media influence. The authors stress the importance of age-appropriate and educational content, favoring materials that teach letters, numbers, and other useful skills.

Although digital technologies have positive aspects, their negative effects on children's development are often more pronounced. Gasser and Palfrey (2008) pointed out that children are far less capable than adults of assessing the reliability and suitability of digital content. When watching inappropriate material, children are often exposed to incorrect grammar and age-inappropriate topics, negatively affecting their linguistic development. Today, a vast amount of information is available on the Internet, presented through various types of content, and assessing its credibility requires prior experience that allows for making such judgments—experience that children do not yet possess (Gasser & Palfrey, 2008).

These findings underline the importance of high-quality, educational media content in fostering children's language and communication development, emphasizing that a balance between entertainment and education can have a positive impact on language growth.

Conclusion

Based on the research results and relevant literature, it can be concluded that the type of digital content preschool children are exposed to, has a significant impact on their communication development. Children who consume educational content achieve better communication outcomes compared to those who watch entertainment content, highlighting the importance of content type. Future studies should focus on differentiating effects by age (e.g., early versus preschool age). Given the increasing presence of digital media in children's daily lives, such research would help develop guidelines for selecting age-appropriate content. These findings provide an important foundation for parents, educators, and professionals in early childhood development, emphasizing the need for a conscious and responsible approach to digital media use to support healthy and quality child development.

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Conflict of interest

None.

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