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Araştırma Makalesi * Research Article

Okul Öncesinde Dijital Araç Kullanımı ile Yaratıcılık Arasındaki İlişki

The Relationship Between the Use of Digital Tools and Creativity in Preschool*

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Öz: 21. yüzyıl, dijital teknolojinin hakim olduğu, çocukların dünyayla etkileşim kurma ve yaratıcılıklarını geliştirme biçimini temelden değiştiren bir çağın başlangıcı olmuştur. Dijital araçların yaygın kullanımı, özellikle çocukların yaratıcılığı üzerindeki etkisiyle ilgili olarak, hem fırsatlar hem de zorluklarla dolu yeni bir tartışma konusuna neden olmuştur. Bu konuda literatür incelendiğinde dijital araçlarının erken yaşlarda kullanımı ile ilgili yaratıcılığı hem olumlu hem de olumsuz etkileyebileceğine dair araştırmalar olduğu görülmektedir. Tüm bu bulgular ışığında dijital teknolojinin kullanımı hayatımızın her alanında artmaya devam ettikçe, çocukların yaratıcı gelişimi üzerindeki çok yönlü etkisini anlamak giderek daha kritik hale gelmektedir. Bu nedenle okul öncesi eğitimde dijital araç kullanımı ile yaratıcılık arasındaki ilişkinin anlaşılması büyük önem taşımaktadır. Bu amaç doğrultusunda bu araştırmada 60-96 ay arası çocuğa sahip 193 ebeveynden elde edilen veriler doğrultusunda dijital araç kullanımı ile çocukların yaratıcılıkları arasındaki ilişki araştırılmıştır. Araştırma verileri, demografik bilgi formu, araştırmacılar tarafından hazırlanan dijital araç kullanım kontrol listesi ve Çiçekler, Pirpir ve Aral, (2020) tarafından Türkçe'ye uyarlanan "erken çocukluk yaratıcılık ölçeği" aracılığıyla toplanmıştır. Yapılan korelasyon analizi sonuçları, ebeveyn görüşlerine göre okul öncesi erkek çocuklarında kız çocuklarına, 5 yaş çocukların 6 yaş çocuklara ve ebeveynlerin dijital araçları kullanım sıklarına göre yaratıcılık düzeyleri arasında istatistiksel olarak anlamlı bir farklılaşma olduğu, kardeş sayısı, dijital araç sayısı gibi değişkenler arasında anlamlı bir farklılaşmanın olmadığı görülmüştür. Bu bulgular, gözlemlenen farklılıkların altında yatan nedenleri araştırmak ve cinsiyet, yaş ve dijital araç kullanımı gibi faktörlerin, ebeveynlerin yaratıcılık algısını nasıl etkilediğini daha iyi anlamak için daha fazla, daha derinlemesine araştırmalara duyulan ihtiyacı vurgulamaktadır. Bu çalışmanın sonuçları, araştırmacılara konu hakkında daha kapsamlı çalışmaların yapılabilmesi, ebeveynlerin de bu konudaki düşüncelerini ve anlayışlarını geliştirmek ve gözden geçirmek için önemli görülmektedir.

Anahtar Kelimeler: Dijital ortam, okul öncesi, yaratıcı düşünme, oyun temelli öğrenme

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Abstract: The 21st century has marked the beginning of an era dominated by digital technology, which has fundamentally changed the way children interact with the world and develop their creativity. The widespread use of digital tools has given rise to a new topic of discussion full of both opportunities and challenges, especially regarding its impact on children's creativity. When the literature on this subject is examined, it is seen that there are studies showing that the use of digital tools at early ages can affect creativity both positively and negatively. In light of all these findings, as the use of digital technology continues to increase in every aspect of our lives, it becomes increasingly critical to understand its multifaceted impact on children's creative development. Therefore, it is of great importance to understand the relationship between the use of digital tools and creativity in preschool education. For this purpose, in this study, the relationship between the use of digital tools and children's creativity was investigated based on the data obtained from 193 parents of children aged between 60-96 months. Research data was collected through a demographic information form, a digital tool use checklist prepared by the researchers, and the "early childhood creativity scale" adapted into Turkish by Çiçekler, Pirpir, and Aral, (2020). The results of the correlation analysis showed that, according to parents' opinions, there was a statistically significant difference between the levels of creativity of preschool boys to girls, 5-year-old children to 6-year-old children, and parents' frequency of use of digital tools. There was a significant difference between variables, such as the number of siblings and the number of digital tools. It has been observed that there is no. These findings highlight the need for further, more in-depth studies to investigate the underlying reasons for the observed differences and to better understand how factors such as gender, age, and use of digital tools influence parents' perceptions of creativity. The results of this study are considered important for researchers to conduct more comprehensive studies on the subject and to develop and review parents' thoughts and understanding on this subject.

Keywords: Digital environment, preschool, creative thinking, play-based learning.

INTRODUCTION

A wide range of traditional forms of creativity, such as drawing, play, and natural and unstructured materials, have been important tools to support human nutrition for many years. But the 21st century has ushered in a comprehensive digital age that has fundamentally revolutionized the way people interact with the world and develop creative labor. 21st century children found themselves surrounded by technological devices almost as soon as they were born, and they built their world on these devices. Computer, mobile phone, tablet etc. Vehicles have been an indispensable part of their lives since their early days. Today, the excessive interaction of individuals in early childhood with technological tools has led to the game going beyond traditional patterns and becoming digital (Kavak, 2022). While early childhood education traditionally emphasizes play-based learning, hands-on activities and interpersonal interaction; Technological developments have added new dimensions to pedagogical strategies and theories (Plowman et al., 2010).

Digital media and tools have given rise to many new insights that are considered to present both opportunities and challenges, especially regarding their impact on children's creativity. When the literature is examined, many studies emphasize that utilizing digital technologies such as iPad and other interactive platforms provides various resources and has the potential to increase creativity in individuals' forms of expression (Plowman, Stevenson, Stephen & McPake, 2012; Flewitt, Messer & Kucirkova, 2015). For example, research shows that the purposeful use of digital technologies, from tablet applications to interactive whiteboards, can serve as a catalyst for creative expression and problem-solving skills (Couse and Chen, 2010; McPake et.al., 2012; Flewitt, Messer, and Kucirkova, 2015). These technological tools provide many benefits for activities that encourage creative thinking, peer interaction, and collaboration (Price et al., 2015).

However, in different studies, researchers have also expressed concerns about the potential disadvantages of digital technology. For example, researchers warn that overuse or passive consumption of technology can stifle creativity (Kirkorian et. al., 2009; Paavonen et. al., 2006; Schmidt et. al., 2008; Sigman, 2012; Uhls et al., 2014). Research has shown that as screen time increases, participation in outdoor and creative play activities, which are very important in supporting creativity, may decrease (Rideout, 2016). Moreover, over-reliance on digital tools can limit sensory experiences considered essential for emotional and cognitive development, restrict physical activity, and minimize face-to-face interactions (Sigman, 2012; Lillard et al., 2013). Research on 5-6-year-olds has shown that

both active and passive TV exposure correlates with shorter sleep duration, sleep disorders, and overall sleep disturbances. Notably, passive TV exposure exceeding 3 hours daily is strongly linked to sleep issues, highlighting the need for parents to limit children's TV exposure (Paavonen et. al., 2006). Similarly, studies on 1-3-year-olds reveal that background TV significantly reduces the time they spend playing and focusing, which may negatively impact cognitive development. Moreover, the presence of background TV also diminishes the quality and quantity of parent-child interactions, potentially hindering developmental progress (Schmidt et. al., 2008). Hedegaard (2009) argues that these practices are shaped by adults' values and beliefs but also that children's interactions in any context are mediated through their own motives and preferences. Thus children's experiences of digital technologies at home must be also focused on the kinds of technologies they encounter, interactions around these technologies, and ways in which the home environment shapes and by these encounters and interactions (McPake et. al., 2012). Such inappropriate and unintentional use of technology can shift the focus away from the core principles of early childhood education, which emphasize the importance of experiential learning in predominantly analog environments (Elkind, 2007). As a result, the relationship between the use of digital tools and creativity in preschool environments shows that it is an important subject area of academic and practical research (Plowman et al., 2010).

In light of these complexities, as digital technology continues to permeate every aspect of our lives, it becomes increasingly important to understand the multifaceted impact of digital technology on children's creative development. Therefore, it is of great importance to understand the relationship between the use of digital tools and creativity in preschool education. This research aims to provide conclusions on how educators, parents, policy makers and researchers should use the most appropriate strategies to integrate technology to support children's development, rather than replacing traditional pedagogical methods aimed at nurturing creativity in children's young minds.

For these purposes, the research sought answers to the following research questions:

Is there a relationship between the gender of preschool children and parents' perception of children's creativity levels?

Is there a relationship between preschool children's siblings and the number of digital tools they have and parents' perception of children's creativity levels?

Is there a relationship between the ages of preschool children and parents' perception of children's creativity levels?

Is there a relationship between the duration of digital device use of parents of preschool children and parents' perception of their children's creativity levels?

Is there a relationship between preschool children's digital tool usage time and parents' perception of children's creativity levels?

RESEARCH METHOD

In this study, descriptive research method, which is one of the quantitative research designs, was used to define and explain in detail the relationship between independent variables and dependent variables in order to examine the relationship between the use of digital tools and creativity levels in preschool children, taking into account different variables.

Participants

The research was conducted with 194 participants. Participants consist of parents with children between the ages of 60-96 months and were selected through random sampling from parents with high accessibility. The data collection form created via Google Form included questions aimed at collecting information about some demographic characteristics of the participants, as well as Early Childhood Creativity Scale (ECCS) items that parents were asked to answer for their children between the ages of 60 and 96 months. Participants accessed the survey online and only one of the child's parents responded to the survey.

Data collection tools

Demographic Form: It includes demographic factors that provide information about the children and their parents, such as gender, age, number of siblings, parent's age, education level, employment status.

Digital Tool Use Checklist: It was prepared by researchers as a result of literature review in order to collect information about the type, frequency, number and purpose of digital tools used at home. This checklist includes questions that provide information about both the child and the parent.

Early Childhood Creativity Scale: The Early Childhood Creativity Scale (ECCS) adapted to Turkish culture by Yıldız Çiçekler, Alakoç Pirpir, Aral (2020) was included. The responses to the items on the scale, which consists of a single factor and a total of 12 items, are "Almost always [7], Very often [6], Frequently [5], Sometimes [4], Rarely [3], Very rarely [2] and Almost never [It was evaluated according to a 7-point Likert type rating: 1]". There are no scale items that need to be reverse-coded. The total score obtained from the responses to items on the scale indicates the child's level of creativity. The minimum score on the scale is 12 and the maximum score of it is 84. The Cronbach Alpha validity of the scale is 0.95 and the split-half reliability of it is 0.92. The parents were asked to fill out the related scale for each one of their children by considering the children's situation.

Analysis of Data

Data analysis was done using the SPSS 20.0 package program. One participant who was considered to be an outlier was not included in the study and the analysis continued with 193 participants. Participants' responses to the Early Childhood Creativity Scale (ECCS); Whether the participants differed according to the gender of their children, the number of siblings (older and younger sister or older and younger brother), and the number of digital technology devices at home (smartphone, computer, tablet and television) was examined through the independent samples t test, which is one of the parametric tests. In examining whether the scores of the participants from the scale differ according to the duration of digital technology use (6 different categories) and the age of the children (60-71 months/5 years, 72-83 months/6 years and 84-96 months and 7 years), one-way parametric tests were used. Analysis of variance (One-way ANOVA) was used. The lowest significance level of $p<0.05$ was taken into account in the interpretation of the techniques used. In addition, the respondents' purposes of using digital technology tools and their children's purposes of using digital technology tools were examined with a histogram chart.

RESULTS

The requirements of these tests were examined to decide whether t-test and one-way analysis of variance (ANOVA) tests could be used in the analysis of the scores obtained from the Early Childhood Creativity Scale (ECCS). The scores obtained from the scale showed a normal distribution in all subcategories of the relevant independent variables; It was observed that the skewness and kurtosis coefficients were between +1 and -1 values, and the Kolmogorov-Simirnov test results were statistically significant. Levene's test was used to test the homogeneity of variances of the population, which is one of the requirements of ANOVA. According to the Levene test results, both the participants' digital tool usage time ($F(5, 184)=0.703$, $p>0.05$) and the children's age ($F(2, 190)=0.103$, $p>0.05$) The variances were calculated to be equal and one-way analysis of variance (ANOVA) test was applied separately for these variables.

Table 1. *Independent samples t test results for examining whether the scores obtained from (ECCS) differentiate according to the gender of the children*

	Gender	*n*	$\bar{X}$	*ss*	*sd*	*t*	*p*	*Cohen's d*
Sum	Girl	102	58.09	9.269	191	-2.057	**0.041***	0.283
	Boy	91	60.71	8.358				

According to the results of the independent samples t test, the scores of those who had a daughter ($\bar{X}$=58.09, sd=9.269) and those who had a son ($\bar{X}$=60.71, sd=8.358) according to their answers to the ECCS were statistically significant in favor of those who had sons. shows a significant difference (t(191)=-2.057, p<0.05). However, the strength of the relationship between the variables was calculated with the Cohen's d formula (Cohen, 1988), and it was concluded that the resulting 0.283 Cohen's d value was a small effect size (Cohen, 1988). Whether there is a significant difference between the scores obtained from the ECCS according to the number of digital technology devices at home (smartphone, computer, tablet and television) and the number of siblings of the child (older and younger sister or older and younger brother), again, independent samples are evaluated. It was examined with t test. Accordingly, it was concluded that the scores obtained by the participants from the ECCS did not show a statistically significant difference according to the relevant independent variables.

Table 2. *ANOVA results for analyzing the scores obtained from (ECCS) according to the age of the children*

	Age	*n*	$\bar{X}$	*ss*	*sd*	*F*	*p*	η^2
ECCS scores	5	71	57.61	9.036	(2, 190)	3.438	**0.034***	0.034
	6	67	61.49	8.568				
	7	55	58.91	8.822				

When the results of the one-way analysis of variance (ANOVA) were examined, it was concluded that the scores obtained from (ECAS) showed a statistically significant difference according to the age of the children (F(2, 190)=3.438, p<0.05). However, the strength of the relationship between the variables was calculated using the eta-square (η2) technique and it can be stated that the obtained eta-square value of 0.034 has a small effect power (Cohen, 1988). In post hoc comparisons made using Bonferroni correction, the average score of 5-year-old children ($\bar{X}$=57.61, sd=9.036) shows a significant difference compared to the average score of 6-year-old children ($\bar{X}$=61.49, sd=8.568). However, the average score of 7-year-old children ($\bar{X}$=58.91, sd=8.822) does not differ significantly compared to the average scores of both 5-year-old and 6-year-old children.

Table 3. *ANOVA results regarding the examination of scores obtained from (ECCS) according to the duration of using digital tools by parents*

	Duration of use	*n*	$\bar{X}$	*ss*	*sd*	*F*	*p*	η^2
ECCS scores	30 min. and less	27	58.93	9.615	(5, 184)	2.473	**0.034***	0.062
	30 min.-1 hour	53	57.87	8.169				
	1-2 hours	45	57.84	8.664				
	2-3 hours	38	60.24	9.854				
	3-4 hours	15	66	6.414				
	4 hours and more	12	61.25	9.314				

When the one-way analysis of variance (ANOVA) results are examined in Table 4, it is seen that the participants' average scores on the ECCS show a statistically significant difference according to the duration of use of digital tools (F(5, 184)=2.473, p<0.05). However, the strength of the relationship between the variables was calculated using the eta-square (η2) technique, and the resulting eta-square value of 0.062 was found to have a medium level of effect (Cohen, 1988). In post hoc comparisons made using Bonferroni correction, the average score of the participants who had a digital tool usage time of 3-4 hours ($\bar{X}$=66, sd=6.414), 30 min-1 hour ($\bar{X}$=57.87 sd=8.169) and 1-4 hours. It was revealed that there was a significant difference between those who used digital tools for 2 hours ($\bar{X}$=57.84 sd=8.664). However, the average ECCS scores of those who used digital tools for 30 minutes or less ($\bar{X}$=58.93 sd=9.615) and the participants who spent 2-3 hours with digital tools ($\bar{X}$=60.24 sd=9.854) were significantly higher than the average of the participants in other groups. undifferentiated.

Finally, children's creativity score averages according to the duration of digital tool use were examined with ANOVA test, and it was concluded that the findings did not show any significant difference.

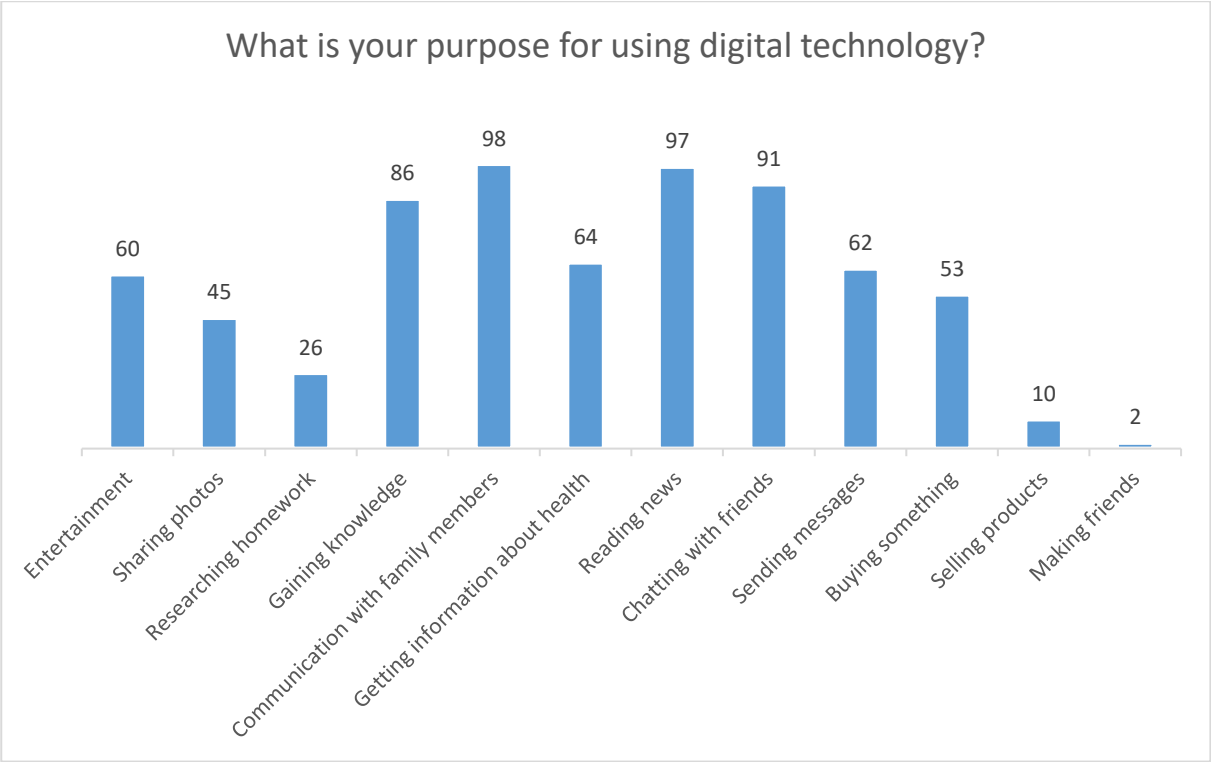

Figure 1. *What is your purpose for using digital technology?*

In order to examine the participants' answers in more depth, some categorical questions were asked through a checklist prepared by the researchers. Accordingly, the participants were asked for what purpose they use digital tools, and as seen in Figure 1, it was concluded that the participants generally use digital tools for communication and obtaining information. Apart from this, it is seen that the majority of people use digital tools for entertainment purposes.

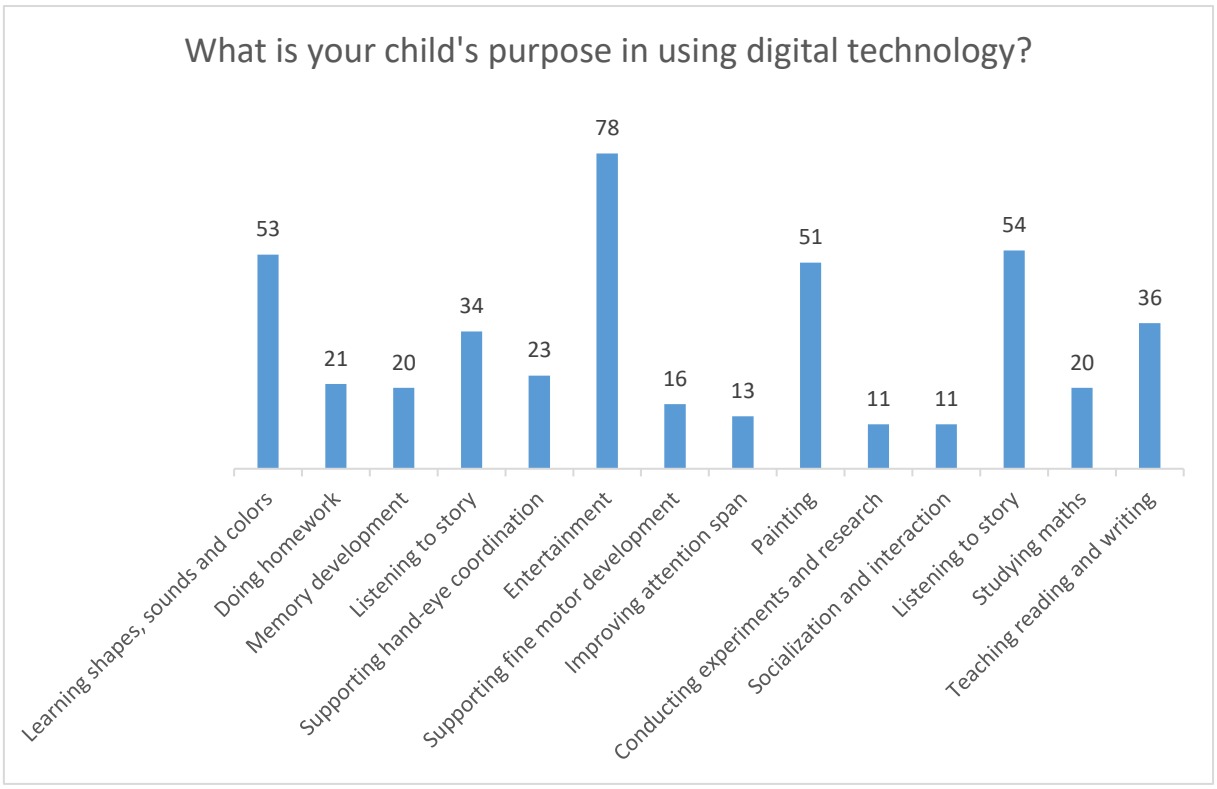

Figure 2. *What is your child's purpose in using digital technology?*

For the same purpose, this question asked for what purpose children use them, and according to Figure 2, it is seen that children use digital tools mostly for entertainment purposes, followed by listening to stories, drawing and learning purposes. Accordingly, it can be said that adults use digital tools mostly for communication and information acquisition, while the majority of children use digital tools for entertainment and effective time.

DISCUSSION

The results of this study provide information about the relationship between different variables by examining the relationship between digital technology use and creativity in the preschool period according to parents' perceptions. The constantly developing process of digital technology begins to affect children from infancy. Its effects on development are therefore worth investigating. However, it is thought that the question of whether the use of digital tools affects children's creativity skills, especially in the preschool period, when creativity levels are at their highest, will also make important contributions to the literature. For instance similarly, Maksić (2016) tried to explain the development of creativity in the digital context by asking questions about creativity in the digital age. Kjällander and Moinian (2014) stated in their research that digital tablets and applications in the preschool period can play an important role in shaping children's creativity towards didactic design. The results of the study suggest that digital tools can impact creative learning experiences among preschoolers.

The results of our research show that parents of boys tend to perceive their children as more creative. However, this result does not definitively prove that girls are less creative than boys. Öncü (2000) examined the formal creativity of 6-year-old children in his study using the Torrence creativity test according to gender variables. Accordingly, it was observed that boys responded more than girls in terms of fluency, but the difference between the averages of girls and boys was not significant. Moran and his colleagues (Moran et. al., 1983) examined the mental fluency of children through an activity consisting of certain formal stimuli. The results of the study showed that boys responded more than girls in terms of fluency, but the difference between the averages of girls and boys was not significant. Gönen et. al (2011) also found no difference in the study no significant difference in the creativity level of children according to gender. It can be said that these results are similar to the results of our study and that the results partially overlap.

Salı (2019), unlike these results, found that preschool fluency scores differed according to gender in favor of girls, while the score representing abstractness differed in favor of boys; The fluency scores and enrichment scores they received in the first grade differed according to gender in favor of the scores of girls; It was determined that the fluency scores they received in the fourth grade differed according to gender in favor of the scores of girls. Another study by Yildiz & Yildiz (2021) is similar to the results of Salı (2019). Yildiz & Yildiz (2021) explored the relationship between creative thinking and scientific process skills of preschool children 3–6 years of age. Accordingly, It was determined that the fluency and elaboration scores of the girls were higher than those of the boys. These different research results make us think that differences in creativity scores between genders can occur independently of gender.

An interesting result emerged in our study when the age of the child was taken into account. Parents of six-year-olds tend to perceive their children as more creative than parents of five-year-olds. However, this difference does not apply to seven-year-olds. Öncü (2003) reached similar findings to our study on the creativity of children aged 12-14 in terms of the differences in creativity according to age. Her study examined the Torrence creativity test according to age and gender variables, and the main effect of age was found to be significant in the "fluency, originality, elaboration and flexibility" sub-factors. Accordingly, it was also observed that the averages of 14-year-old subjects were significantly higher than those of 12- and 13-year-old subjects. Xiong, Liu, and Huang (2022) investigated the effect of digital educational games on the creative thinking of preschool children and revealed results regarding age-related differences in creativity in digital educational environments. Torrance (1963) stated that creativity generally increases with age, but a decrease occurs at some ages, as a result of his research using the TCTT measurement tool based on long-term observation among children aged 3-18 (as cited in Gökmen & Çarpan 2019). These results explain variation between age differences and can be seen as similar to the fact that according to the parental perceptions in our study, 6-year-old children were significantly higher than 5-year-olds. It can be said that this partly explains the results of our study,

in which creativity perceptions were higher in 6-year-olds compared to 5-year-olds, but such an increase was not observed in 7-year-olds compared to 5 and 6-year-olds. These results show that there is a difference between creativity scores according to age. It can be thought that the irregular increases and decreases seen in creativity areas at different ages have something to do with development. Because, according to the literature, these age ranges are seen as the ages where there is a transition to different developmental processes.

Analysis of the relationship between the number of siblings and digital device ownership and parents' perceptions of creativity shows that these factors do not significantly affect the way parents perceive their children's creativity. McPake, Plowman, and Stephen (2013) investigated how preschoolers create and communicate with digital technologies at home. Their findings highlight the importance of considering the home environment and use of digital technology in understanding developmental differences, as observed in this study. Behnamnia et al. (2020) examined the components of creativity in digital game-based learning among young children and found that digital games can promote creativity, supporting the idea that digital technology can influence creative development. Dongauser, Nezhinskaya and Glazyrina (2020) contributed to the discussion of the role of digital tools in nurturing creativity by emphasizing the development of creative abilities in preschool children using musical digital technologies. However, in the studies conducted, it is seen that variables such as the number of siblings and the effect of the number of digital tools are not examined. Accordingly, it can be concluded that these variables do not have a significant effect on creativity.

Examining the findings of the time spent on digital devices in the study, it was revealed that parents who spent 3-4 hours on digital devices perceived their children to be more creative than those who spent half an hour or less. This result shows that the time parents spend in front of the screen may affect their perception of their children's creativity. Research shows that the mediation of learning through children's use of digital tools is affected by their interactions with adults or more able peers, and the culturally and historically defined social situation of the child's learning circumstances (Rogoff, 2003; Hedegaard, 2009; McPake et.al., 2012). However, surprisingly, the study did not find a significant relationship between children's digital device use time and parents' perceptions of their children's creativity. It is important to conduct more comprehensive research to better understand the complex dynamics at play here. This result shows that, although the effects of sociocultural characteristics on digital tool use behavior are understood, screen time is not a definitive indicator of how parents perceive their children's creative abilities. In order to express an opinion on this issue, it seems that there is a need to obtain results from larger longitudinal studies that take these variables into account. Fielding and Murcia (2022), in their study examining studies in the literature with a systematic analysis method linking digital technologies to the creativity of young children, concluded that appropriately designed and used digital technologies can indeed encourage and facilitate the creativity of young children.

The research also included details about the purposes for which parents and children use digital devices. Accordingly, it has been observed that while parents use digital tools mainly for information, communication and entertainment, children use them primarily for entertainment and learning. These differences in the use of digital tools indicate that digital devices play different roles for parents and children. It seems worth investigating whether these different uses affect creativity differently. Sarıçam's (2019) doctoral thesis discussed the effect of digital game-based STEM applications on students' interest in STEM fields and scientific creativity. This has shown that digital games can stimulate students' creativity by increasing their interest levels. Karaçelik (2022) examines the contribution of digital storytelling based on child philosophy to the creative and critical thinking of 6-year-old children. It makes a significant contribution to how such digital tools can develop children's creativity and critical thinking skills. Kocaman-Karoğlu (2015) study discusses how storytelling changes with technology and the effects of digital storytelling on creativity. In creativity education, it is very important for children to think differently and create different products. Originality is one of the important parts of creativity (Runco, Illies and Eisenman 2005). Packe et al. (2012) observed how children's play activities incorporated technologies, demonstrating that they saw technological tools as part of their everyday environment and understood their purposes, even when they were not necessarily able to use them fully themselves. For example, they used old computers, non-functioning mobile phones and toy replicas of technological items, such as supermarket scanners or laptops, as

props for imaginative games involving work in imaginary homes, shops or schools. These results are a good example of how digital tool use affects children's creativity.

This study did not evaluate how parents perceive or define creativity. For this reason, it is thought that the findings of this research, in which the creativity test was answered according to their perceptions, reduce the generalizability of the results. This situation can also be considered a limitation of the study. In conclusion, this study has provided valuable information about the complex relationship between parents' perceptions and different variables affecting preschool children's creativity. This research reveals the need for more in-depth research to understand the role of digital technology in shaping creativity and understanding developmental differences, and to investigate the underlying reasons for the observed differences.

CONCLUSIONS AND SUGGESTIONS

The results of this study present the relationships between 60-96 month old children's use of digital tools and their creativity according to parents' perceptions, in different variants.

In the results of the analysis based on the question: Is there a relationship between the gender of preschool children and parents' perception of children's creativity levels? According to the creativity scale scores of parents of boys, it was concluded that their perception that their children are creative is higher. According to this result, it does not provide definitive information about whether the creativity of girls is lower or higher than that of boys. Further studies with more detailed measurements can be conducted in future studies to understand the reason why this result differs by gender and to investigate whether gender has an effect on creativity level.

The results of the analysis based on the question "Is there a relationship between the number of siblings of preschool children and the number of digital tools they have and parents' perception of children's creativity levels?" According to parental perceptions, it shows that the number of siblings and the number of digital devices have no effect on children's creativity.

The results of the analysis based on the question "Is there a relationship between the ages of preschool children and parents' perception of children's creativity levels?" It showed that there was a significant difference between the ages of 5 and 6. Accordingly, it shows that parents of 6-year-old children perceive their children's creativity levels to be higher than those of 5-year-olds. However, it was observed that parents of 7-year-olds did not have such a perception. Accordingly, it cannot be concluded that as children's age increases, their creativity levels improve. In order to comment on this, more detailed study results that take into account children's ages and developmental levels are needed. In future studies, these variables can be taken into account and the factors on creativity scores and why parental perceptions change in that age range can be discussed.

The results of the analysis based on the question: Is there a relationship between the duration of digital tool use of parents of preschool children and parents' perception of children's creativity levels? Parents who use digital tools for 3-4 hours have different perceptions of their children's creativity levels compared to those who use digital devices for half to an hour. Accordingly, parents who spend 3-4 hours on digital tools think that their children have high creativity. This result affects parents' children. It is derived from the conclusions reached based on how they perceive them. Therefore, more comprehensive studies are needed to determine whether time spent affects children's creativity.

According to the question, is there a relationship between preschool children's use of digital tools and parents' perception of their children's creativity levels? Children's creativity score averages according to the duration of digital tool usage were examined with ANOVA test, and no relationship was observed between the duration of children's use of digital tools and their creativity levels, according to parents' perceptions.

In order to interpret the study results in more depth, the results obtained from structured questions asked about the purposes for which parents and children use these tools are that parents use them mostly for information, communication and entertainment purposes; It was concluded that children use it mostly for entertainment and learning purposes. According to this result, other studies

can be conducted to understand whether the creativity of those who use digital tools as a means of communication or entertainment differs and those who do not.

In conclusion, this study provides valuable information about the relationship between parents' perceptions and various variables affecting preschool children's creativity. These findings highlight the need for further, more in-depth research to investigate the underlying reasons for the observed differences and to better understand how factors such as gender, age, and digital tool use influence parents' perceptions of creativity. In future studies on this subject, investigating the effect of the purpose of digital tool use on creativity perceptions may yield interesting results. The results of this study are considered important for developing and revising parents' thoughts and understandings on this subject, while laying the groundwork for researchers and educators to conduct more comprehensive studies on the subject.

REFERENCES

Behnamnia, N., Kamsin, A., & Ismail, M. A. B. (2020). The landscape of research on the use of digital game-based learning apps to nurture creativity among young children: A review. *Thinking Skills And Creativity,* 37, 100666.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd Ed.). Hillsdale, NJ: Erlbaum.

Couse, L. J., & Chen, D. W. (2010). A tablet computer for young children? Exploring its viability for early childhood education. *Journal of Research on Technology in Education,* 43(1), 75-98. https://doi.org/10.1080/15391523.2010.10782562.

Dongauser, E. V., Nezhinskaya, T. A., & Glazyrina, E. Y. (2020, May). *Development of creative abilities of preschool children using musical digital technologies.* In International Scientific Conference "Digitalization of Education: History, Trends and Prospects" (DETP 2020) (Pp. 187-191). Atlantis Press.

Elkind, D. (2007). *The power of play: How spontaneous, Imaginative Activities Lead to Happier, Healthier Children.* Da Capo Lifelong Books.

Fielding, K., & Murcia, K. (2022). Research linking digital technologies to young children's creativity: An ınterpretive framework and systematic review. *Educational Research,* 32(1), 105-125.

Flewitt, R., Messer, D., & Kucirkova, N. (2015). New directions for early literacy in a digital age: the ipad. *Journal Of Early Childhood Literacy,* 15(3), 289-310. https://doi.org/10.1177/1468798414533560.

Gökmen, A., & Sözer Çapan, A. (2019). Investigation of creative problem solving skills in 60-84 months old children. *International Primary Education Research Journal,* 3(1), 1-9.

Gönen, M., Çiçekler, C. Y., Akyuz, E., Arslan, A. Ç., & Baydemir, G. (2011). Examination of the Creativity Level of 5 Year Old Children. *Education Sciences,* 6(1), 1185-1195.

Hedegaard, M. (2009). Children's development from a cultural–historical approach: Children's activity in everyday local settings as foundation for their development. *Mind, Culture, and Activity*, *16*(1), 64-82.

Kjällander, S., & Moinian, F. (2014). Digital tablets and applications in preschool-preschoolers' creative transformation of didactic design. *Designs for Learning*, 7(1).

Karaçelik, E. (2022). Examining the contribution of digital storytelling based on child philosophy to the creative and critical thinking of 6-year-old children. [Unpublished Master's Thesis], Karatay University Graduate Education Institute, Department of Child Development.

Kavak, Ş. (2022). Digital game-based learning model as an educational approach. *Prizren Social Science Journal,* 6(2), 62-70.

Kirkorian, H. L., Pempek, T. A., Murphy, L. A., Schmidt, M. E., & Anderson, D. R. (2009). The impact of background television on parent–child interaction. *Child development*, *80*(5), 1350-1359. https://doi.org/10.1111/j.1467-8624.2009.01337.x.

Kocaman-Karoğlu, A. (2015). The changing nature of storytelling in the educational process with technology: Digital storytelling. *Educational Technology Theory and Practice,* 5(2), 89-106.

Lillard, A. S., Lerner, M. D., Hopkins, E. J., Dore, R. A., Smith, E. D., & Palmquist, C. M. (2013). The impact of pretend play on children's development: A review of the evidence. *Psychological Bulletin,* 139(1), 1-34. https://doi.org/10.1037/a0029321.

Maksić, S. (2016). Some questions about creativity in digital age. *Nastava İ Vaspitanje,* 65(1), 17-29.

Mcpake, J., Plowman, L., & Stephen, C. (2013). Pre-school children creating and communicating with digital technologies in the home. *British Journal of Educational Technology,* 44(3), 421-431. https://doi.org/10.1111/j.1467-8535.2012.01323.x.

Moran III, J. D., Milgram, R. M., Sawyers, J. K., & Fu, V. R. (1983). Stimulus specificity in the measurement of original thinking in preschool children. *The Journal of Psychology*, 114(1), 99-105. https://doi.org/10.1080/00223980.1983.9915402.

Öncü, T. (2000). Comparison of figural creativity of 6-year-old kindergarten children in terms of gender variable. *Ankara University Faculty of Languages, History and Geography Journal*, 40(1-2), 25-34. https://dergipark.org.tr/en/pub/dtcfdergisi/issue/66763/1044004.

Öncü, T. (2003). Comparison of Creativity Levels of Children Aged 12-14 by age and gender using torrance creative thinking tests-shape test. *Ankara University Faculty of Languages, History and Geography Journal,* 43(1), 221-237.

Paavonen, E. J., Pennonen, M., Roine, M., Valkonen, S., & Lahikainen, A. R. (2006). TV exposure associated with sleep disturbances in 5-to 6-year-old children. *Journal of sleep research,* 15(2), 154-161. https://doi.org/10.1111/j.1365-2869.2006.00525.x.

Plowman, L., Stephen, C., & Mcpake, J. (2010). Supporting young children's learning with technology at home and in preschool. *Research Papers in Education*, 25(1), 93-113. https://doi.org/10.1080/02671520802584061.

Plowman, Stevenson, O., L., Stephen, C., & McPake, J. (2012). Preschool children's learning with technology at home. Computers & Education, 59(1), 30-37. https://doi.org/10.1016/j.compedu.2011.11.014.

Price, S., Jewitt, C., & Crescenzi, L. (2015). The role of ipads in pre-school children's mark making development. *Computers & Education,* 87, 131-141.

Rideout, V. (2016). Measuring time spent with media: The common sense census of media use by US 8- to 18-year-olds. *Journal of Children and Media,* 10(1), 138-144.

Rogoff, B. (2003). *The cultural nature of human development*. Oxford University Press.

Runco, M. A., Illies, J. J., & Eisenman, R. (2005). Creativity, originality, and appropriateness: What do explicit instructions tell us about their relationships? *The Journal of Creative Behavior,* 39(2), 137-148

Salı, G. (2019). A longitudinal study on the development of creativity in children. *Bolu Abant İzzet Baysal University Faculty of Education Journal,* 19(4), 1574-1589.

Sarıçam, U. (2019). *The effect of digital game-based stem applications on students' interest in stem fields and scientific creativity: Minecraft example,* [Doctoral Dissertation], Marmara University, Turkey.

Schmidt, M. E., Pempek, T. A., Kirkorian, H. L., Lund, A. F., & Anderson, D. R. (2008). The effects of background television on the toy play behavior of very young children. *Child development*, *79*(4), 1137-1151. https://doi.org/10.1111/j.1467-8624.2008.01180.x.

Sigman, A. (2012). Time for a view on screen time. *Archives of Disease in Childhood,* 97(11), 935-942. https://doi.org/10.1136/archdischild-2012-302196.

Torrance, E. (1963). *The nature-nurture problem in creativitiy: Handbook of creativity.* New York: Plenum Press.

Uhls, Y. T., Michikyan, M., Morris, J., Garcia, D., Small, G. W., Zgourou, E., & Greenfield, P. M. (2014). Five days at outdoor education camp without screens improves preteen skills with nonverbal emotion cues. *Computers in Human Behavior*, 39, 387-392. https://doi.org/10.1016/j.chb.2014.05.036.

Yildiz, C., & Yildiz, T. G. (2021). Exploring the relationship between creative thinking and scientific process skills of preschool children. *Thinking Skills and Creativity,* 39, 100795. https://doi.org/10.1016/j.tsc.2021.100795.

Xiong, Z., Liu, Q., & Huang, X. (2022). The influence Of digital educational games on preschool children's creative thinking. *Computers & Education,* 189, 104578. https://doi.org/10.1016/j.compedu.2022.104578.