

International Child and Information Safety Congress “Digital Games”

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PANEL PRESENTATIONS



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Benefits Of The Digital Technology Use In Preschool Children

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Abstract

The post modern period has changed many habits and life styles of social life, and has made electronic devices and computers that produce, use and store information an indispensable part of everyday life. Nowadays, children who can reach the information very fast and effectively through the internet, also enjoy the convenience of reaching digital games in the same way. According to the data in 2017 the number of mobile phone subscribers in Turkey 78 million, while the number of internet subscribers is about 68 million. The study was conducted between January 15 and March 4, 2018, based on the views of 101 parents who are children in the 0-6 age group. Online questionnaire software (Google Documents) was utilised to design the online survey and to collect data. This was consistent with the methodology of previous research. The online survey firstly asked basic demographic questions such as age, gender and occupation. A questionnaire prepared by the researchers asked parents 14 possible benefits of playing their children's digital games. Responses given by the parents to the questions were recorded and analyzed. The average age of the parents participating in the study was 32.7 ± 6.9 years. It was determined that 20,6% of the parents' education levels were graduate, 42,3% were undergraduate and 14,4% were high school. According to parents, the benefits of children's digital gaming habits are already right; 61.4% used children's games as educational material, 60.2% created opportunities to learn new things, 44.8% wanted to explore and learn new things, 39.1% 32.8% contribute to foreign language learning and development, 30.7% help to develop mental skills, 28.2% contribute to hand-eye co-ordination, 18% 7% contribute to motivation and leisure, 16.6% contribute to the development of creativity, 14.1% contribute to the development of fine and coarse motor skills, and 12% improve the writing and communication skills, 11,2% allow the development of problem-solving, reasoning, analysis and decision-making skills, 9,5% of children are socialized, and 6,2% they said they gave the opinion that they are hanging. Parents participating in the study reported that children played digital games on many platforms (tablet, computer, smartphone, etc.). According to the findings of the study, it was reported that children who play digital games use these games as educational material, increase their desire to discover and learn new things, help children to stay calm while eating and at home or abroad, and to contribute to foreign language learning and development. It has been proved that video games with educational content have positive effects on children. These games make learning fun. Surveys have found that all video games, including violent games, encourage children to think about the ways and means to reach their goals. This teaches them the ability to make plans and deal with complex situations. Video games are



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interactive games that your child must constantly practice to be the best. Despite the usefulness of digital gaming, we think that parents should be careful about the length of the time and the dependence of the child on playing digital games.

Key words: Technological device, Child, Language development

Introduction

The post modern period has changed many habits and life styles of social life, and has made electronic devices and computers that produce, use and store information an indispensable part of everyday life (Bozkurt, 2006). Especially the increasing role of knowledge in developed and developing societies has dragged children as much as adults into a more information-intensive life. With the devices the child uses at school, at home or on the road, both the information and the virtual world can easily reach many activities. Today’s children have more access to electronic media than those of any previous generation (Brown, 2011). This has also brought considerable changes in the way children play (Wright et al., 2001). Nowadays, children who can reach the information very fast and effectively through the internet, also enjoy the convenience of reaching digital games in the same way. According to the data in 2017 the number of mobile phone subscribers in Turkey 78 million, while the number of internet subscribers is about 68 million (TÜİK, 2017).

The most important tool of childhood culture and the area in which the child expresses himself most effectively is the game. In our country and the world in recent years traditional toys and street games have left their places to virtual games. In Turkey, every day, computer, internet, mobile phone usage rates are increasing. An average of 15 million children aged 5-17 years use these devices as a tool for playing games while playing games on these devices. Apart from computer and mobile phone games, vcd, dvd, Playstation etc. electronic and digital toys and game players will also increase this figure.

The use of digital gaming in early childhood is more likely to occur with the presentation of adults around the child. One of the most important criticisms of digital games is that games are perceived only as a means of entertainment and time. However, it is seen that children have a positive influence on their academic development as well as on their development areas, support the competencies such as following commands given in digital games and hand-eye coordination (Rideout & Hamel, 2006). For this reason, the purpose of our study was to explore the benefits of pre-school children's digital gaming habits.

Methods

The study was conducted between January 15 and March 4, 2018, based on the views of 101 parents who are children in the 0-6 age group. Online questionnaire software (Google Documents) was utilised to design the online survey and to collect data. This was consistent with the methodology of previous research. The online survey firstly



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asked basic demographic questions such as age, gender and occupation. A questionnaire prepared by the researchers asked parents 14 possible benefits of playing their children's digital games. Responses given by the parents to the questions were recorded and analyzed.

The data obtained in the study were analyzed using SPSS 20.0 (Statistical Package for the Social Sciences) statistical package program. In the evaluation, descriptive statistics methods such as mean, standard deviation and frequency distribution were used.

Results

The average age of the parents participating in the study was 32.7 ± 6.9 years. It was determined that 20,6% of the parents' education levels were graduate, 42,3% were undergraduate and 14,4% were high school. The average age at which children start playing digital games is 2.9 ± 1.6 years. It was found that 63.5 ± 81.8 minutes of digital play time of children during the day. 55.2% of the children participated in the study, 69.3% in the mobile phone, 83.2% in the tablet and 15.4% in the game console. According to parents, the benefits of children's digital gaming habits are already right; 61.4% used children's games as educational material, 60.2% created opportunities to learn new things, 44.8% wanted to explore and learn new things, 39.1% 32.8% contribute to foreign language learning and development, 30.7% help to develop mental skills, 28.2% contribute to hand-eye co-ordination, 18% 7% contribute to motivation and leisure, 16.6% contribute to the development of creativity, 14.1% contribute to the development of fine and coarse motor skills, and 12% improve the writing and communication skills , 11,2% allow the development of problem-solving, reasoning, analysis and decision-making skills, 9,5% of children are socialized, and 6,2% they said they gave the opinion that they are hanging.

Discussion

Parents participating in the study reported that children played digital games on many platforms (tablet, computer, smartphone, etc.). According to the findings of the study, it was reported that children who play digital games use these games as educational material, increase their desire to discover and learn new things, help children to stay calm while eating and at home or abroad, and to contribute to foreign language learning and development.

The computer offers an environment of entertainment and information that children can both actively participate in, and it forces them to make independent decisions and implement them as individuals. It also has a structure that measures success or failure, offers the opportunity to practice as much as he wants, and allows him to repeat as much as he or she does not understand (Öcel, 2002).

There are approaches to game-based learning that reinforce previous knowledge, which reduces the level of anxiety and anxiety of learners who are helping individual learners, makes learning more enjoyable, and that there are educational computer games, science, mathematics, medicine, learning, problem solving, and developing strategic thinking skills (İŞÇİBAŞI, 2011).



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Research has found that certain highquality programs have educational benefits for children older than 2 years. Children who watch these programs have improved social skills, language skills, and even school readiness. (Wright et al., 2001) However, the educational merit of media for children younger than 2 years remains unproven despite the fact that three-quarters of the topselling infant videos make explicit or implicit educational claims. To be beneficial, children need to understand the content of programs and pay attention to it. Children older than 2 years and those younger than 2 years are at different levels of cognitive development and process information differently (Piaget & Cook, 1952).

It has been proved that video games with educational content have positive effects on children. These games make learning fun. Educational institutions where children are able to solve problems by playing games support such games. Surveys have found that all video games, including violent games, encourage children to think about the ways and means to reach their goals. This teaches them the ability to make plans and deal with complex situations. Video games are interactive games that your child must constantly practice to be the best. The boys go back to play again and again because this makes them feel a success. Moreover, children who play video games are helping to develop their sense of perception, cognition, and movement skills (İŞÇİBAŞI, 2011). Despite the usefulness of digital gaming, we think that parents should be careful about the length of the time and the dependence of the child on playing digital games.

Conclusions

According to the findings of the study, it was reported that children who play digital games use these games as educational material, increase their desire to discover and learn new things, help children to stay calm while eating and at home or abroad, and to contribute to foreign language learning and development. It has been proved that video games with educational content have positive effects on children. These games make learning fun. Surveys have found that all video games, including violent games, encourage children to think about the ways and means to reach their goals. This teaches them the ability to make plans and deal with complex situations. Video games are interactive games that your child must constantly practice to be the best. Despite the usefulness of digital gaming, we think that parents should be careful about the length of the time and the dependence of the child on playing digital games.

References

- Bozkurt, V. (2006). *Değişen Dünyada sosyoloji: temeller-kavramlar-kurumlar*: Ekin Kitabevi.
- Brown, A. (2011). Media use by children younger than 2 years. *Pediatrics*, 128(5), 1040-1045.
- İŞÇİBAŞI, Y. (2011). BİLGİSAYAR, İNTERNET VE VİDEO OYUNLARI ARASINDA ÇOCUKLAR. *Selçuk Üniversitesi İletişim Fakültesi Akademik Dergisi*, 7(1), 122-130.
- Öcel, N. (2002). İletişim ve çocuk. *İletişim Ortamlarında Çocuk Reklam ve Etkileşim*.



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Piaget, J., & Cook, M. (1952). *The origins of intelligence in children* (Vol. 8): International Universities Press New York.

Rideout, V., & Hamel, E. (2006). *The media family: Electronic media in the lives of infants, toddlers, preschoolers and their parents*: Henry J. Kaiser Family Foundation.

TÜİK. (2017). Türkiye İstatistik Kurumu: Yayın.

Wright, J. C., Huston, A. C., Murphy, K. C., St Peters, M., Piñon, M., Scantlin, R., & Kotler, J. (2001). The relations of early television viewing to school readiness and vocabulary of children from low-income families: The early window project. *Child development*, 72(5), 1347-1366.



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Evaluation of Reflections of Digital Technology on Child Development

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Abstract: Leisure habits of children have considerably changed with the spread of digital technologies into the family homes (1). Even though the undesirable consequences of digital games that are in the scope of digital technology and nowadays commonly used by children are more concerned, the positive sides contributing to the development of social, emotional, cognitive and personal perceptions on children should not be overlooked. The fact that all these positive and negative effects may vary according to age groups in children is also an issue in many studies. Digital games are the most widely used area in digital technology between the ages of 2-14 years. It has been determined that while children around 6 years old play digital games on computer, children around 10 years old play digital games mostly on mobile phones. Studies have shown that young people who live in geographical areas where playing digital game is common play an average of 10000 hours of online gaming by the age of 21 (2). While digital games in generally have positive contribution about such as personal development of children, treatment and/or therapy of some specific illnesses (physiological stammering, social phobia etc.), learning and development of foreign languages, developing strategy and ability to make quick decision, providing hand-eye and mind coordination, development of motor skills in children, motivation and using as a leisure time tool and enhancing technological knowledge and skill, digital games' negative effects leading to digital games come into agenda are risks that they emerge at the social level. Usage times up to the degree of dependence on children can cause adverse effects such as obesity, physical and pathological disturbances. Furthermore, it causes disruption and retardation in language development, to develop postponement behaviour, difficulties in emotion control and personality disorders, sociopathy, to decrease in intra-family communication, difficulty in distinguishing the difference between virtual and reality, development of aggressive feelings, thoughts and behaviours due to its elements of violence, major health problems such as carpal tunnel syndrome and attention deficit, to disrupt language development of children and also causes children to become vulnerable to online threats. It affects adversely academic and personal achievement due to reducing studying, reading and participating in physical activities times as well (3, 4). The scientific studies that emphasize the positive and negative effects of digital games on children were evaluated from a holistic point of view in the study. In this study it is aimed to form solution proposals by evaluating the studies examining effects of digital games on physical, cognitive and psychosocial development of children with positive and negative aspects. In the statistics published by Turkish Statistical Institute in 2013, it was determined that among the reasons for the use of computers of children, digital games are considered to be a priority place and digital games are also preferred choice for mobile phone use (5). There are many studies addressing the harms of digital games and they generally refer to the negative side of digital games. However, there are also studies indicating that the results of digital games will be positive if quality of the digital game, time spent playing the digital game and appropriateness of playing the right game at the right age are proper.



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In addition, studies have shown that digital games contribute to the development of attention, concentration, correct decision making, problem solving, group work, creative thinking skills. Digital games helping children to develop basic mathematics, reading and language skills, are both more fun and more effective for children compared to traditional training methods about education issue. There are studies focusing on the fact that digital games contribute to the development of children's social skills in treatment and therapy of autism and there are studies focusing on the psychological aspects of games that have therapeutic effects on children. In the elimination of the lack of attention frequently encountered in children, positive effects were shown in the field of education, especially social life, thanks to digital games (6, 7). Digital games can also be thought of as an important educational and entertainment tool in acquiring skills such as planning, goal setting, strategy formulation and critical thinking. The existing disadvantages can be turned into advantages as long as the right time, the right ratio, the appropriate age and the specific purpose criteria are met in digital games.

Key words: Digital games, child development, digital technology

Introduction

Technology is a criterion of modernization and societal development. However, on the one hand it facilitates human life and on the other hand it brings with it some negativity and danger arising from the unconscious use of digital technology (4).

The wide spectrum starting with accessing to digital technologies and extending to managing the individual's digital presence is factors that designate the positive or negative impact of digital technology on a person's life.

Nowadays, the effects of digital technologies are greatly affecting both the present and the potential future life of children. For this reason, getting the most out of digital technology is an important factor that can affect life for every child. When digital technology and its impact on physical and mental development of child are take into consideration, the positive and negative aspects of this relationship need to be considered more carefully (8).

Digital games are the most widely used area in digital technology between the ages of 2-14 years. In the statistics published by Turkish Statistical Institute in 2013, it was indicated that among the reasons for the use of computers of children, digital games are took up to be a priority place and also about 70% of children using mobile phone were also stated to prefer digital games (5, 8).

The widespread settlement of digital technologies in educational environments and homes has created a commercial market that includes also small children. These types of applications are applications produced for learning or only entertainment and aimed at



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attracting and maintaining children's attention enjoyably. Many studies consider that learning experiences acquired through exploring the game with great interest, trying and imagination, creativity and reasoning play an important role in child's development in early childhood as in all games (9). It is clear that the age group that has the least information about online risks is the childhood age group. Because this period is a period when the capacity of the child to question the content or credibility of the relationship established online is generally weak. If digital games ranking first in the list of most used entertainment tools in this period are not used properly and consciously, this situation primarily affects the children physically and emotionally and thus can lead to consequences that could indirectly affect the whole society (10). In addition, in some studies, it is identified that approximately 46% of children in Turkey do not know the rules for the protecting personal information in social network. For this reason they may risk themselves and their relatives unwittingly (11).

When literature is examined, there are different studies focusing on the positive and negative effects of digital technology on child development. In this study; on behalf of evaluate positive and negative effects of digital games, frequently used by children nowadays, on the development of children, the scientific studies emphasizing the positive and negative effects of children's use of digital games have been evaluated from a holistic perspective. In this study, it was aimed to form solution offers by evaluating studies examining effects of digital games on physical, cognitive and psychosocial development of children with positive and negative point of views.

Positive Effects of Digital Games on Child Development

Digital games are fun for children and provide a social entertainment space. Apart from only entertainment purposes, digital games that also aim at teaching together with fun are called serious computer games. It is clear that the activities held under the name of playing game are perceived more enjoyable than any work or necessity for an individual of any age, including children. For this reason, these activities provide a more permanent learning. Some computer games have begun to be preferred for both children and adults. This shows that the idea that games are just for fun is diminishing over time. Research has determined that these games help children's individual learning and make learning more fun for children by reducing the level of anxiety and apprehension. Games that have good time for a child but have precepts in the activity or reinforce the previously acquired knowledge as educational computer games improve the problem solving ability and strategic thinking ability in children. Educational games can be used in a variety of educational field, primarily in science, mathematics, and language learning (12). Apart from these, digital games also have different effects on children's cognitive and educational field. Digital games provide an experiential learning on the basis of problem and accordingly an active learning in children. This type of



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learning is a different form of learning than learning by reading book. The situation that the child can advance in his / her game by using the information he / she has already obtained constitutes knowledge enhancement attitude. In addition, the child applies possibilities and gets feedback of different possibilities. This type of learning carries out by trial-and-error learning in the child (13).

When the literature is examined, it has been seen that because multiple jobs have to be fulfilled at the same time, some digital games such as strategy games develop the ability to do multiple jobs in children (14). Digital games provide children to set goals, effort to achieve these goals, feel their sense of accomplishment more than once and they renew their self-confidence by tasting the sense of accomplishment. Furthermore, these children can react and respond faster than those who do not play digital games (6).

Researches have stated that children playing suitable digital games perform better about managing, controlling and planning than those who do not play digital games (14). Digital games, which help in the development of hand-eye coordination in the child, are also improving focusing and ability to visually observe many objects at the same time. Motion-based games that require physical interaction and are called “Exergames” can help children to make the necessary physical movements for their development (6). These games requiring physical mobility can help children to develop motor skills and protect their condition (15).

In addition, digital sports games can allow children to learn sports rules and practice them in real life (16). Digital games can also be used in medicine. When necessary, they are used for psychotherapy and to improve inadequate motor skills, when necessary.

It has been observed that they can help children to develop spatial, mathematical and problem-solving skills of children (17, 18). Digital games can also be used for the treatment of children with developmental disabilities such as autism. It has been observed that digital games provide improving in social skills of autistic children and relieve children because of their therapy characteristics. In addition, it has been found that digital games provide improving in school and social life of children experiencing lack of attention (6). It has also been reported that digital games are used in the treatment of certain specific diseases such as physiological stuttering and social phobia (3).

Negative Effects of Digital Games on Child Development

Long-term use of digital technology can cause many physical discomforts in individuals. However, since the developmental period of the childhood age group is still in development, physical discomforts can be more serious. Such physical discomforts are mostly related to musculoskeletal system due to long-term computer using or sitting



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disorders when playing digital games. Tension and cramp in the muscles are common findings. In addition, complaints such as eye fatigue, pain and burning in eyes due to eye dryness can be seen. Apart from that, the radiation waves emitted from the computer also affect children more seriously than adults (7).

A study involving students has showed that the most frequent complaints related to computer using are discomforts in neck, back, wrists and knees. In addition to these, because of intense visual focusing, it is also stated in the research findings that it is experienced dryness, pain or burning in eyes (19). Furthermore, in a broad study which families using internet in all urban centers across Turkey were taken as universe, Kuzu et al have stated that the most common physiological discomforts seen in a family due to using of information and communication technologies are respectively eye fatigue and eye redness; back and / or neck pain, headache, joint and / or muscle pain, fatigue and insomnia. Same research has revealed that physiological problems increase as the time that family members spend in front of their computers increase (20).

In addition, it has found that physical activity decrease, weight gain and physical development anomalies are observed in children and adolescents as the time spent in front of computers increase (7, 21).

Although positive effects of digital games on cognitive development have been mentioned in our study, these effects are only valid when the child actively use his / her mental ability and is not passive. However, many software or activities that do not have such critical features are also widely used and this situation is a critical issue especially for child development (16). That is, there are critical time intervals for healthy cognitive development of children. If the time that the child spend in unqualified digital games displace with events which are important steps in cognitive development such as communication with the individual around the child, gathering attention on inner processes, and dreaming; these skills that cannot be gained in the development process can be difficult or even impossible to obtain later (7). Furthermore, the concept of addiction, which manifests itself in the form of disruption of daily activities by children because of the time spent on computer, can emerge important problems in children's cognitive and psychosocial development. Although the concept and definition of addiction is unclear, findings indicate that addiction hampers significant steps in development (7).

Conclusion and Suggestions

As can be seen from the study, reflection of digital technology on child development has been evaluated from the positive and negative aspects and it has been seen that digital games have beneficial and harmful effects on the physical, cognitive and psychosocial aspects. Appropriateness of child development stages and characteristics, content and



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qualifications, time spent for digital games are key elements that determine the positive and negative effects of a digital game on child development. Any nonconformity of these factors can negatively affect child development in terms of physical, cognitive and psychosocial. In this context, some measures can be taken such as checking of digital games as much as possible until a certain age and maturity, setting up certain rules about place, time, quality and duration of game, accompanying to child as much as possible during the event and restricting access to certain contents. One of the important points here is trying to create these rules through directing rather than through banning, and making the child perceive it in this way. Studies have indicated that adults explain with mutual dialogue while they set up rules is much less often seen than that adults follow a restrictive approach while they set up rules (22). This is difficult but certainly a useful process. It should be taken into consideration that gaining habit of playing computer games in childhood within specific rules may affect later periods. Of course, the level of awareness and perception of parents putting rule about digital game is also determining in child development. Digital games have a positive impact on child development. However, digital games have advantages as well as disadvantages as in every matter nowadays. The point to note is that the digital game is transferred to the child's development process at the right time, in the right place, in line with planned and specific objectives.

References

- 1- Aydogan Boschele, F., Cizmeci, E. (2016). Media in leisure time and turkish family. *Yalova Journal of Social Sciences*, 6(11), 284-302.
- 2- Ceylaner, S., Yanpar Yelken, T. (2017). Views of secondary school students on the contributions of digital games to their vocabulary knowledge in english. *Bartın University Journal of Faculty of Education*, 6(1), 346-364.
- 3- Final Report on Child and Family Guidance Workshop for Digital Games. October 10, 2017. Ankara. Republic of Turkey Ministry of Family and Social Policies <http://www.guvenliweb.org.tr/dosya/U93fp.pdf> Date of access: 02.03.2018.
- 4- Cam, H.H., Nur, N. (2015). A Study on the prevalence of Internet addiction and its association with psychopathological symptoms and obesity in adolescents. *TAF Preventive Medicine Bulletin*, 14(3), 181-188.
- 5- Küçükali, A. (2015). Children's rights to play and the changing play culture. *Erzincan University Journal of Social Sciences Institute (ERZSOSDE)* 8(1), 1-14.
- 6- Bozkurt, A. (2014). Homo ludens: Digital games and education. *Journal of Education Technologies Researches*, 5(1).
- 7- Akbulut, Y. (2013). Developmental implications of computer and internet use among children and adolescents. *Trakya University Journal of Education*, Volume 3, Issue 2, 53-68.



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“Digital Games”
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- 8- Odabasi, H.F. (Ed.) (2017). Child in digital life. Ankara.
- 9- Verenikina, I., Kervin, L., Rivera, M., Lidbetter, A. (2016). Digital play: Exploring young children's perspectives on applications designed for preschoolers. *Global Studies of Childhood*, 6 (4), 1-12.
- 10- Cakir, H. (2013). The opinions of families about computer games and determining the effects on students. *Mersin University Journal of the Faculty of Education*, Vol. 9, Issue 2, pp.138-150.
- 11- Kucukali, M., Bulbul, H.I. (2015). Increasing the conscious and safe usage of internet within the scope of fatih project. *Journal of Turkish Science- Research Foundation* 8 (2) 1-18.
- 12- Gurcan, A., Ozhan, S., Uslu, R. (2008). Digital games and theirs effects on children. Republic of Turkey General Directorate of Family and Social Research. Ankara. 1-50.
<http://ailetoplum.aile.gov.tr/data/54292ce0369dc32358ee2a46/internet%20ve%20aile.pdf> Date of access: 02.02.2018.
- 13- Oblinger, D. (2004). The next generation of educational engagement. *Journal of Interactive Media in Education*, 2004(8), 1–18.
- 14- Boot, W.R., Kramer, A.F., Simons, D.J., Fabiani, M., Gratton, G. (2008). The effects of video game playing on attention, memory, and executive control. *Acta Psychologica*, 129 (3) , 387-398.
- 15- Papastergiou, M. (2009). Exploring the potential of computer and video games for health and physical education: a literature review. *Computers & Education*, 53 (3) (2009), pp. 603–622.
- 16- Kim, M., Hyungil, K. (2007). The theory of planned behaviour and the intention to play sport video games. The North American Society for sport management conference. Florida, USA.
- 17- Masendorf, F. (1993). Training of learning disabled children’s spatial abilities by computer games. *Zeitschrift fur Padagogische Psychologie*, 7, 209-213.
- 18- Hollingsworth, M., Woodward, J. (1993). Integrated learning: Explicit strategies and their role in problem solving instruction for students with learning disabilities. *Exceptional Children*, 59, 444-445.
- 19- Harris, C., Straker, L. (2000). Survey of physical ergonomics issues associated with school children’s use. *International Journal of Industrial Ergonomics*, 26, 337-346.
- 20- Kuzu, A., Odabasi, F., Eristi, S.D., Kabakci, I., Kurt, A.A., Akbulut, Y., Dursun, Ö. Ö., Kiyici, M., Sendag, S. (2008). Internet usage and family. Republic of Turkey General Directorate of Family and Social Research. Ankara.
<http://ailetoplum.aile.gov.tr/data/54292ce0369dc32358ee2a46/internet%20ve%20aile.pdf> Science series: 133. Date of access: 02.02.2018.



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- 21- Mota, J., Ribeiro, J., Santos, M.P., Gomes, H. (2006). Obesity, physical activity, computer use, and TV viewing in Portuguese adolescents. *Pediatric Exercise Science*, 18, 113-121.
- 22- Livingstone, S., Bober, M. (2006). Regulating the Internet at home: Contrasting the perspectives of children and parents. D. Buckingham and R. Willett (Ed.), *Digital generations: Children, young people, and new media*.



Screening Time and Video Game Playing Use Among Children Aged 6-8 Years

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Abstract

Aim: Due to the widespread use of computers and video games, the positive and negative effects of computers on children and young people have begun to be questioned. On the other hand, violent video games have been reported to cause aggressive behaviors in children and adolescents. Also, it has been reported that long-term use of the computer can cause psycho-social problems, obesity, physiological problems, musculoskeletal system problems, adversities in social development and internet addiction. The aim of the research is to determine the habits of children at school education and their families and to evaluate certain beliefs and attitudes of parents about children’s media use.

Material and Methods: The study was conducted between 1 to 28 February 2018 with the permission of the school children and their families. The study group was consisted of 6-8 year old school-age children (n = 100) and their families who applied to Baskent Hospital in Ankara. The questionnaire which was a form developed by the researchers was used in order to reach demographic information and computer usage habits of the child and their family,

Results: In this study the mean age of the children was 83.3 ± 8.6 months and 50% of them are boys. The age at which girls started using the screen was 10.4 ± 4.2 months, and for boys it was 10.5 ± 4.3 months ($p = 0.852$). 40% of the girls and 34.0% of the boys used more than 2 hours of screen ($p = 0.534$). 68% of the children were playing video games. 48.0% of the girls and 88.0% of the boys were playing video games ($p < 0.001$). The rate of playing video games more than two hours was 14% for girls and 40% for boys. The age at which girls began using video was 33.6 ± 14.4 months, and that of boys was 27.6 ± 12.0 months ($p = 0.091$). There was no correlation between the screen time and body mass index z score. In the study, 69% of the children were living with a person who played video games in their home. The percentage of children playing video games varied according to the playing status of another person at home (75.4% in playing video games at home, 51.6% in non-playing, $p = 0.019$). There was also a significant relationship between parents' habits of playing video games and their children ($p < 0.05$). The frequency of using video and using social media was not affected by the parents working, the educational status, the place where the family lived, the number of children family had, index child’s birth order and the family structure ($p > 0.05$). There was no significant relationship between the use of social media by the parents and the



children ($p > 0.05$). The limitations on the use of the screen for children by their family were 34.4% for screen time <30 minutes, 60.9% for 1 hour, 61.1% for 1-2 hours and 37% for >2 hours. Overall, 37.3% of the children preferred another social activities instead of playing video. 29% of the children felt positive, 19% of the children felt negative and 52% of the children felt as if inside when they were playing video. 41% of the children used the computer in their own room and 12% of the children used it outside the home.

Conclusions: The important finding in this study was onset age of playing video game had come down to preschool period. More than one third (39.7%) of the children who played video games performed more than two hours. The families should consider that the duration of playing computer games would be possibly prolonged in the older age group. In the study, it was determined that the behavior of children playing video games increased according to the situation of parents playing video games. It was also determined that boys were more likely to play computer games than girls. The interests of parents were directly influencing children's computer use rates. It could be explained that children were searching for a role model pattern in this period. Technological developments were seemed to affect the habits of playing video games in children. For this reason, parents should help their children to get the right play habits during this period. The information and counseling on selection of computer games, duration of computer use and playing computer games should be provided for the families.

Key words: Child, computer games, video games, social media use

Introduction

Children are increasingly exposed to televisions, computers and other screen media devices such as smart phones and electronic tablets [1]. Also, there is an increasing trend among younger children and infants to use mobile devices [2]. Kabali et al [3] showed that children ranging in age from 6 months to 4 years spend 45 minutes in a day watching television, 27 minutes using videos on a mobile device, 22 minutes using apps on a mobile device, and 15 minutes playing games on a video console. Health guidelines recommend that children aged less than 2 should be exposed to a limited amount of educational mobile screen media use, while for those aged 2–5, the daily screen time should be less than 1 hour [4]. However, a significant proportion of young children are exceeding the recommended exposure time. Surprisingly, 75% of children had their own mobile device by the age of 4 [3]. Despite all of this media time and new technology, many parents seem to have few rules regarding the use of internet by their children [5]. It is important that parents become aware of the nature of the Internet and social media sites, given that not all of them are healthy environments for children. In a recent study, two-thirds of the children and teenagers reported that their parents have “no rules” regarding time spent using social media [6]. Despite the increase in the use of mobile screen media by young children, very limited research has been carried out to identify



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the correlates associated with their increased use. Also, there is limited information about the attitudes of parents about children’s media use in Turkey.

The aim of this study was to evaluate media access/use of children aged 6- 8 years, and to evaluate certain beliefs and attitudes of parents about children’s media use.

Material and Methods:

This cross-sectional study was conducted between 1 to 28 February 2018 with the permission of the school children and their families. The study group was consisted of 6-8 year old school-age children (n = 100) and their families who applied to Baskent Hospital in Ankara. The questionnaire which was a form developed by the researchers was used in order to reach demographic information and computer using habits of the child and their family. A self-completion questionnaire was developed for parents who use social media to determine their attitudes, beliefs, and opinions concerning the use of television, internet, and social media of their children. The questionnaire included questions regarding demographic information (age, gender, educational status, number of children, and age of children), using video games and social media, average daily watching alone time of children, parents’ habits regarding video games and social media and parents’ attitudes, weight and height of child.

We evaluated the presence of television, computers, mobile phones, and iPad/tablets at home or in the child’s bedroom as well as daily media use of children. Our aims also included parents’ views about their children’s media use.

Data Analysis

A statistical analysis was performed using SPSS 17. The descriptive analysis was calculated and described as numbers and percentages.

Results:

In this study the mean age of the children was 83.3 ± 8.6 months and 50% of them are boys. Of the children %66 lived in the city center. Computer and smart phone were in all houses, but of the children 41% had Game console. Of the children 41% used the computer in their own room and 12% outside the home. The limitation on the use of the media for children by their family was 46%. The age at which girls started using the screen was 10.4 ± 4.2 months, and for boys it was 10.5 ± 4.3 months ($p = 0.852$). 40% of the girls and 34% of the boys used more than 2 hours of screen ($p = 0.534$).

Overall, 68% of the total children were playing video games; 48% girls and 88% boys ($p < 0.001$). The age at which girls began using video was 33.6 ± 14.4 months, and that of boys was 27.6 ± 12.0 months ($p = 0.091$). The rate of playing video games more than two hours was 14% for girls and 40% for boys. Of the children 61.2% who were playing video preferred video games to other activities.



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In the study 69% of the children were living with a person who played video games in their home. The percentage of children playing video games varied according to the playing status of another person at home (75.4% in playing video games at home, 51.6% in non-playing, $p = 0.019$). There was also a significant relationship between parents' habits of playing video games and their children ($p < 0.05$).

The frequency of using video and using social media was not affected by the maternal occupation, parental education, the place where the family lived, the number of siblings, the birth order of children and the family structure ($p > 0.05$).

There was no significant relationship between the use of social media by the parents and the children ($p > 0.05$).

The screen time of children had no effect on z scores of body mass index. On the other hand, children with more than 2 hours of screen time had short length (0.39 ± 0.70 , -0.00 ± 0.83 , $p = 0.015$). Neither playing video game nor using social media affected z scores of height and body mass index.

The limitations on the use of the screen for children by their family were 34.4% for screen time <30 minutes, 60.9% for 1 hour, 61.1% for 1-2 hours and 37% for >2 hours. Overall, 37.3% of the children preferred another social activities instead of playing video. 29% of the children felt positive, 19% of the children felt negative and 52% of the children felt as if inside when they were playing video.

Discussion

There is limited knowledge regarding the use of internet and media among children and their parents in Turkey. Mobile phones, tablet computers, and social media are widely used by children especially in the pre-school age. However, there is a lack of sufficient research and guidelines on attitudes of parents about children's media use and protecting children's safety in the use of media devices in developing countries, as well as in Turkey.

The important finding in this study was onset age of playing video game had come down to preschool period. Overall, 27% of the children in the study and 39.7% of the children who played video games performed more than two hours. We found that children aged between 6 and 8 years were more likely to have higher mobile screen media use. The families should consider that the duration of playing computer games would be possibly prolonged in the older age group. Similarly, those who were better skilled in using the devices had more access to media devices at home (41%). Studies suggested that in the children aged 8 years and less, parental behaviours, and the home environment can be more influential in shaping their behaviour [7,8].

In the study, it was determined that the behavior of children playing video games increased according to the situation of parents playing video games. The interests of parents were directly influencing children's computer use rates. It could be explained by



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children were searching for a role model in this period. Children of parents with higher mobile screen media use may be more likely to have higher use due to parent role modelling. Of interest, role modelling either by parents could be an important strategy to decrease young children’s mobile media use [9].

This study found no association between child’s body mass index (BMI) and screen use. In contrast to this, a prospective study reported that the increase in screen time during a 2-year follow-up period was smaller for children who had lower BMI at 13 months [10].

It was also determined that boys were more likely to play computer games than girls. Technological developments were seemed to affect the habits of playing video games in children. For this reason, parents should help their children to get the right play habits during this period. The information and counseling on selection of computer games, duration of computer use and playing computer games should be provided for the families.

We concluded that there is a need for guidelines on the use of the Internet and social media for parents. Encouraging parents to monitor children’s media carefully can have a wide range of health benefits for children.

References

- 1) Connell SL, Lauricella AR, Wartella E. Parental co-use of media technology with their young children in the USA. *J Child Media* 2015;9:5–21.
- 2) Hinkley T, Verbestel V, Ahrens W, Lissner L, Molnár D, Moreno LA, et al. Early childhood electronic media use as a predictor of poorer well-being: a prospective cohort study. *JAMA Pediatr* 2014;168:485-492.
- 3) Kabali HK, Irigoyen MM, Nunez-Davis R, Budacki JG, Mohanty SH, Leister KP, et al. Exposure and use of mobile media devices by young children. *Pediatrics* 2015;136:1044-1050. [doi: 10.1542/peds.2015-2151] [Medline: 26527548]
7. Kemp S. *We are Social*. 2016.
- 4) Radesky JS, Schumacher J, Zuckerman B. Mobile and interactive media use by young children: the good, the bad, and the unknown. *Pediatrics* 2015;135:1–3.
- 5) American Academy of Pediatrics. *Children, adolescents, and the media*. *Pediatrics* 2013;132:958-961.
- 6) Rideout V. *Generation M2: Media in the Lives of 8- to 18-Year-Olds*. Menlo Park: Kaiser Family Foundation; 2010.
- 7) Lawman HG, Wilson DK. A review of family and environmental correlates of health behaviors in high-risk youth *Obesity (Silver Spring)*. 2012;20:1142–57.
- 8) Bronfenbrenner U, Evans GW. Developmental science in the 21st century: emerging questions, theoretical models, research designs and empirical findings. *Soc Dev* 2000;9:115–25.
- 9) Brown R, Ogden J. Children's eating attitudes and behaviour: a study of the modelling and control theories of parental influence. *Health Educ Res* 2004;19:261–71.



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“Digital Games”
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10) Matarma T, Koski P, Löyttyniemi E, et al. The factors associated with toddlers' screen time change in the STEPS Study: A two-year followup. *Prev Med* 2016;84:27–33.



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Multi-centered investigation of pre-school children's screen time and digital game playing habits

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Abstract

Aim

Early childhood is a critical period for the acquisition of healthy habits. The American Academy of Pediatrics revised screen-media recommendations to emphasize the critical role of parents on children's use of technology that is part of everyday life. In this period, parents are advised to limit children's screen (television, video, computer, video game) time, help them to choose the right media and monitor their children. With the widespread use of the Internet, the use of digital games between children and young people is increasing day by day. The useful and harmful effects of playing video games, especially on children and adolescents, are being discussed, and many studies have been conducted on this topic. The purpose of our study is to investigate the screen time and playing video game habits of children aged between 2 and 5 years and to examine the attitudes of parents in this area.

Material-Methods

Our study was designed as a cross-sectional descriptive study. Our work was approved by Hacettepe University Faculty of Medicine Ethics Commission (02.01.2018). The study was carried out in 6 centers in 3 provinces; between 10/01/2018 and 10/03/2018. Parents who applied to these centers and had children between the ages of 2 and 5 were included in the study.

Results

674 pre-school children and their parents were recruited to study. The mean (SD) ages of the children were 3.6 (1.0) years and 51.6% were male. The rates of availability in the households are 99% for smartphone, 74.6% for computer and / or tablet and 6.8% for



the gaming console. 89.2% of the households had internet connection. Only 6.1% of the families studied neither mother nor father use social media.

The mean age at which children started to use screen were 17.8 (9.9) months, but only three of them had no screen contact. 19.7% of the children were using screens for over four hours.

27.2% of the children were playing digital games. The rate of playing digital games in boys was 30.0% while it was 24.2% in girls ($p = 0.095$). The age at which children begin to play digital games is 2.7 (1.0) years. There was a positive correlation between the age at which the children started to contact with screen and the age at which they started to play digital games ($r = 0.22$, $p = 0.003$).

Conclusion

In our study, it was determined that the screen usage was very frequent in pre-school period, and this age group seems to carry risks in terms of adverse effects of screen contact in large scale. The early age of first screen contact causes the earlier age of digital gaming. This relationship between digital gaming and screening should not be overlooked in the approach to risk. It has been determined that the rate of playing digital games is higher in boys in preschool period as in other age groups, and the neurological, biological and psychosocial factors that make up this difference need to be elucidated.

Key Words: Pre-school, screen, digital games, video games

Introduction

Early childhood is a critical period for the acquisition of healthy habits (1). The American Academy of Pediatrics revised screen-media recommendations to emphasize the critical role of parents on children's use of technology that is part of everyday life (2). In this period, parents are advised to limit children's screen (television, video, computer, video game) time, help them to choose the right media and monitor their children (3). Today's children have access to electronic media, from built-in DVD players to intelligent mobile technology, far ahead of previous generations (4).

It is foreseen that the use of the screen may reduce both the quality and the quantity of parent-child interaction, although some media managers claim that educational media programs must be watched by both parents and children for the sake of social interaction and facilitation of the learning process (5,6). Technological developments have affected many things in our lives, but they also have changed children's playing habits (7). Computer games can greatly contribute to hand-eye coordination, concentration and problem solving skills between the ages of 0-6, which is the fastest and most critical years of development. The child can reinforce many concepts that he



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learned during his / her daily life and education by computer games (3). On the other hand, violent computer games have been shown to cause aggressive behavior in children and adolescents (8,9).

Until now, there has not been a comprehensive multi-center study on screening time and digital gaming habits of pre-school period in our country. In this study, we aimed to investigate the screen time and digital gaming habits of children aged 2-5 year in a multi-centered manner and to examine the attitudes of parents in this area.

Material-Methods

Our study was designed as a cross-sectional descriptive study. Our work was approved by Hacettepe University Faculty of Medicine Ethics Commission (02.01.2018). The study was carried out in 6 centers in 3 provinces; Ankara (4 centers: Dr. Sami Ulus Children's Hospital, Etimesgut Şehit Sait Ertürk State Hospital, Yıldırım Beyazıt University Yenimahalle Training and Research Hospital, General Directorate of Public Health Preschool), Afyonkarahisar (1 Center, Afyon Kocatepe University Medical Faculty Hospital) (1 center, Mersin University Medical Faculty Hospital); between 10/01/2018 and 10/03/2018. Parents who applied to these centers and had children between the ages of 2 and 5 were included in the study. Data were obtained by face-to-face interview with structured survey. Written informed consent was obtained from all participants.

Demographic characteristics (age, educational level, and occupation of parents, number of children, family structure, economic level and residence), general characteristics of the child (age, gender, birth order, caregiver), internet, computer, tablet, smartphone, game console, social media useage of family members, the child's screen time and the habits of playing video games and,parents' attitudes were questioned.

The data was analyzed in the SPSS 23.0 package program. Data was evaluated by arithmetic mean, standard deviation, percent distributions. Percentage distributions between the two groups are compared with Chi-square test. The effects of variables on screen use and playing video games were tested by logistic regression analysis and Odds ratio and 95% confidence intervals were calculated. Values of $p < 0.05$ were considered statistically significant

Results

674 pre-school children and their parents were recruited to study. The mean (SD) ages of the children were 3.6 (1.0) years and 51.6% were male. The rates of availability in the households are 100% TV, 99% for smartphone, 74.6% for computer and / or tablet and 6.8% for the gaming console. 89.2% of the households had internet connection. Only 6.1% of the families studied neither mother nor father use social media. The mean age at which children started to use screen were 17.8 (9.9) months, but only three of them had no screen contact. 19.7% of the children were using screens for over four hours.



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When we examine the relationship between socio-demographic characteristics and screen time of children over two hours, we found that the screen time periods of children living in a district, living in a large family, children of the young mother, children cared at home, whose mother doesn't work, with low parental education were significantly higher (p values respectively; $p=0.013$, $p=0.044$, $p=0.002$, $p<0.001$, $p<0.001$, $p<0.001$). When we look at the characteristics of children, we found that boys, children with simultaneous videogame playing, watching alone, without parental control had significantly higher screen time durations (p values respectively; $p=0.029$, $p=0.047$, $p<0.001$, $p<0.001$).

27.2% of the children were playing digital games. The rate of playing digital games in boys was 30.0% while it was 24.2% in girls ($p = 0.095$). The age at which children begin to play digital games is 2.7 (1.0) years. There was a positive correlation between the age at which the children started to contact with screen and the age at which they started to play digital games ($r = 0.22$, $p = 0.003$). The duration of daily digital gaming was <30 minutes in 33.9%, more than 2 hours in 15.3% of the children and did not change according to sex.

In single analyzes, the rate of playing digital games doubled in children over four years of age (OR: 2.04, 95% CI, 1.45-2.88). Children of working mothers have a lower rate of playing digital games (22.9%, $p = 0.022$). Living in the city center or in the district, family structure (core or extended family), maternal age (<30, 30-39, ≥ 40 years) did not effect the use of digital game. Children of young fathers played digital games more ($p = 0.004$).

Discussion

Progress in information and communication technologies has increased the possession of technological devices. This increase has made it easier for pre-school children to meet devices such as tablets and phones before acquiring basic skills. The use of these Internet-connected devices is shifting to earlier ages (10). In the USA, Kabali at al. (11) found the ratio of households' TV, tablet, smartphone, game console, computer and internet access respectively 97%, 83%, 77%, 56%, 58%, 59% in the study of children aged 6 months to 4 years in 2014. In our study, the rates of television, smart phone, computer and / or tablet and game consoles were 100%, 99%, 74.6% and 6.8% respectively; and rate of internet access was 89.2%. Both rates of smartphone and internet access are very high in our study. We think that this increas depends on the increase of smart phone usage every year.

It has been shown that a child watches an average of 1 hour of TV per day and this reaches 7.25 hours per day at 4 years of age with other screen contacts (12). In Greece, Kourlaba at al. (13) have shown that 11% of children in the 1-2 years age group and 32% of the 3-5 year old children exceed the two-hour limit of screen time commonly recommended. In the study conducted by Gündoğdu at al. (14) between the ages of 2



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and 6 years, the average age of onset of screen use was around 3-4 years, while the rate of screen use over four hours was found to be 7%.

In our study, mean starting age (SD) of screening of pre-school children was 17.8(9.9) months, only three of them had no screen contact. 19.7% of the children were using screens for over four hours. Christakis at al. (15) found that children receiving home care are more likely to be exposed to television than children who receive care at nurseries. In our study, we also found that screen time of children cared at nurseries were significantly lower.

We have found that the frequency of digital gaming has changed significantly with age. In our study, we showed that the rate of playing video games for children older than 4 years is 2 times higher and this difference is statistically significant. In addition, one of the important finding of our study is the positive correlation ($r = 0.22$, $p = 0.003$) between the age at which the child started the screening and the age at which he started digital gaming.

Määttä at al. (16), in their study on 864 children between the ages of 3 and 6, found as parental education increased, the child screen time decreased significantly, while screening time for children whose parents disciplined was significantly lower. We also found that screen time of children with high educated parents and whose parents banned was significantly lower.

Akçay at al. (3) found that the frequency of playing digital games is higher in children whose parents play digital games ($p < 0.001$). Similarly, we found that the rate of playing digital games in children increases in the presence of individuals playing digital games at home ($p = 0.000$).

Conclusion

In our study, it was determined that the screen usage was very frequent in pre-school period, and this age group seems to carry risks in terms of adverse effects of screen contact in large scale. The early age of first screen contact causes the earlier age of digital gaming. This relationship between digital gaming and screening should not be overlooked in the approach to risk. It has been determined that the rate of playing digital games is higher in boys in preschool period as in other age groups, and the neurological, biological and psychosocial factors that make up this difference need to be elucidated.

Key Words: Pre-school, screen, digital games

References

1. Natale, R. A., Messiah, S. E., Asfour, L., Uhlhorn, S. B., Delamater, A., & Arheart, K. L. (2014). Role modeling as an early childhood obesity prevention strategy: effect of



- parents and teachers on preschool children's healthy lifestyle habits. *J Dev Behav Pediatr*, 35(6), 378-387.
2. Council On, C., & Media. (2016). Media and Young Minds. *Pediatrics*, 138(5). doi:10.1542/peds.2016-2591
 3. Akçay, D., & Özcebe, H. (2012). Okul öncesi eğitim alan çocukların ve ailelerinin bilgisayar oyunu oynama alışkanlıklarının değerlendirilmesi. *Çocuk Dergisi*, 12(2), 66-71.
 4. Brown, A. (2011). Media use by children younger than 2 years. *Pediatrics*, 128(5), 1040-1045
 5. Garrison, M. M., & Christakis, D. A. (2005). A teacher in the living room?: Educational media for babies, toddlers and preschoolers: A background report prepared for Kaiser Family Foundation: Henry J. Kaiser Family Foundation.
 6. Christakis, D. A., Gilkerson, J., Richards, J. A., Zimmerman, F. J., Garrison, M. M., Xu, D., . . . Yapanel, U. (2009). Audible television and decreased adult words, infant vocalizations, and conversational turns: a population-based study. *Archives of Pediatrics & Adolescent Medicine*, 163(6), 554-558.
 7. Gentile, D. A. (2011). The multiple dimensions of video game effects. *Child development perspectives*, 5(2), 75-81.
 8. Anderson, C. A., Gentile, D. A., & Buckley, K. E. (2007). *Violent video game effects on children and adolescents: Theory, research, and public policy*: Oxford University Press.
 9. Irwin, A. R., & Gross, A. M. (1995). Cognitive tempo, violent video games, and aggressive behavior in young boys. *Journal of family violence*, 10(3), 337-350.
 10. Ergüney M. (2017). İnternetin Okul Öncesi Dönemdeki Çocuklar Üzerindeki Etkileri Hakkında Bir Araştırma . *Ulakbilge*, 5(17), 1917-38.
 11. Kabali, H. K., Irigoyen, M. M., Nunez-Davis, R., Budacki, J. G., Mohanty, S. H., Leister, K. P., & Bonner, R. L. (2015). Exposure and use of mobile media devices by young children. *Pediatrics*, 136(6), 1044-1050.
 12. Mazur, A., Caroli, M., Radziewicz-Winnicki, I., Nowicka, P., Weghuber, D., Neubauer, D., Hadjipanayis, A. (2018). Reviewing and addressing the link between mass media and the increase in obesity among European children: The European Academy of Paediatrics (EAP) and The European Childhood Obesity Group (ECOG) consensus statement. *Acta Paediatrica*, 107(4), 568-576
 13. Kourlaba, G., Kondaki, K., Liarigkovinos, T., & Manios, Y. (2009). Factors associated with television viewing time in toddlers and preschoolers in Greece: the GENESIS study. *Journal of public health*, 31(2), 222-230.
 14. Gündoğdu, Z., Seytepe, Ö., Pelit, B. M., Doğru, H., Güner, B., Arıkız, E., Aydoğdu, G. (2016). Okul Öncesi Çocuklarda Medya Kullanımı. *Kocaeli Üniversitesi Sağlık Bilimleri Dergisi*, 2(2), 6-10.
 15. Christakis, D. A., & Garrison, M. M. (2009). Preschool-aged children's television viewing in child care settings. *Pediatrics*, 124(6), 1627-1632.
 16. Määttä, S., Kaukonen, R., Vepsäläinen, H., Lehto, E., Ylönen, A., Ray, C., Roos, E. (2017). The mediating role of the home environment in relation to parental educational level and preschool children's screen time: a cross-sectional study. *BMC public health*, 17(1), 688



Assessment of Exposure to Technological Equipment and Sleep Status of Infants and Toddlers

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Abstract

It has been reported that in the early childhood period, the sleeping time decreased with the increase of the habit of keeping the television, computer, tablet or phone in the bedroom. Sleeping time of 6-12 months infants who were exposed to television in the evening hours were significantly reduced when compared to those who were not exposed. Children who use social media or sleep with technological devices in the bedroom have been found to be at increased risk for sleep disturbances. From this point of view, the 0-2 age range has a great prospect for child development. The need for open air and sleep during this period are some of the basic physiological requirements of children. The period of healthy sleep that is accepted for the development of children in this period is 13-15 hours. Meeting these requirements in the first two years is crucial for the child to feel safe and at peace. The aim of our study was to determine the effects of 0-2 age group on children's exposure to technological devices and their sleep states. The survey was conducted between November 10, 2017 and February 28, 2018, with the views of 40 parents who were 0-2 years old. Online questionnaire software (Google Documents) was utilised to design the online survey and to collect data. This was consistent with the methodology of previous research. The online survey firstly asked basic demographic questions such as age, gender and occupation. In the questionnaire prepared by the researchers, the parents were asked about their children's habits of using the device and their sleep status. 58% of the children participating in the study were male. It was found that the use time of the technological device during the day was 148.4 ± 123.8 minutes. During the day, it was found that the duration of television viewing was $47,6 \pm 44,7$ minutes, that of phone was $34,5 \pm 52,1$ minutes and that of tablet was $19,5 \pm 51,3$ minutes. 42.5% of the parents who participated in the study reported that their children had a technological device (television, mobile phone, etc.) in the bedroom. It was reported that the duration of device use was 9.2 ± 12.1 and the duration of sleeping dive was 22.9 ± 14.1 minutes before children were allowed to sleep. It was determined that the daily sleeping period was 9.5 ± 2.7 hours. According to 58% of parents, technological use of children is decreasing their sleeping times and 42.8% of children reported sleeping problems such as sleeping, late sleeping, late waking and nightmares. Forty-five percent of parents reported that they allowed their children to eat at home, or use technological devices to stay calm at home or abroad. They also reported that 27.5% of parents never let their children out, while 22.5% said it was less



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than 30 minutes. It was observed that 0-2 age group children were exposed to technological devices within 2.5 hours during the day. Nearly half of the families participating in the study reported that their children had at least one technological device in the bedroom. As a result, we think that sleep duration is longer and children sleep less than children in the same age group. It was also observed that half of the parents who participated in the study were encouraging their children to use technological devices and that their children were taking them out for less than half an hour or never. Today, children are growing up in the experience of using highly personalized technology; Therefore, parents should make efforts to ensure that children can apply and benefit from principles such as quality sleep and positive social interaction for healthy growth and development of children by making plans according to their age, health status, character and level of development. However, parents should be aware of their duties and responsibilities in order to balance the time of technology and other activities with the technology.

Key words: technology, sleeping time, television, baby, device, bedroom

Introduction

Today's children have more access to electronic devices than those of any previous generation. Currently, 90% of parents reported that their children younger than 2 years watch some form of electronic media (Zimmerman, Christakis, & Meltzoff, 2007). By 3 years, almost one third of children have a television in their bedroom. Parents reported that they view television as a peacekeeper and a safe activity for their children while they are preparing dinner, working at home, or doing household chores (Rideout & Hamel, 2006). Many parents reported feeling better knowing that the programming their children watch has been described as educational. Parents who believe that television is “very important for healthy development” are twice as likely to have the television on all or most of the time (Vandewater et al., 2005).

Children who are watching television programs or recorded programs intended for their viewing, termed “foreground media.” Others are exposed to programs intended for adults, termed “background media,” because the television is on while they are present in the room. Children are exposed to 4 hours or more of televised programs per day. Other children may be watching a 30-minute DVD while a parent is just taking a shower or preparing dinner. Some children are watching shows with parents, and some are watching alone. On average, children younger than 2 years watch television programs 1 to 2 hours/day (Zimmerman et al., 2007). Fourteen percent of children aged 6 to 23 months watch 2 or more hours/day of media (Rideout & Hamel, 2006).

Some media industry executives claim that educational media programs are meant to be watched by both the parent and the child to facilitate social interactions and the learning process (Garrison & Christakis, 2005). However, it is not clear whether this happens in the real world.



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Although there is equal access to media among children of different socioeconomic groups, the amount of media consumption is unequal. Children who live in homes with lower socioeconomic status and children with single mothers or mothers with less than a high school education are spending more time in front of a screen on a daily basis. Research has found that certain highquality programs have educational benefits for children older than 2 years. Children who watch these programs have improved social skills, language skills, and even school readiness.

It has been reported that in the early childhood period, the sleeping period decreased with the increase of the habit of keeping the television, computer or mobile phone in the bedroom. Sleeping times of 6-12 months infants who were exposed to television in the evening hours were significantly reduced when compared to those who were not exposed. Children who overuse social media or sleep with technological devices in the bedroom have been found to be at increased risk for sleep disturbances. From this point of view, the 0-2 age range has a great prospect for child development. The need for open air and sleep during this period are some of the basic physiological requirements of children. The period of healthy sleep that is accepted for the development of children in this period is 13-15 hours. Meeting these requirements in the first two years is crucial for the child to feel safe and at peace. The aim of our study was to determine the effects of 0-2 age group on children's exposure to technological devices and their sleep states.

Methods

The survey was conducted between November 10, 2017 and February 28, 2018, with the views of 40 parents who were 0-2 years old. Online questionnaire software (Google Documents) was utilised to design the online survey and to collect data. This was consistent with the methodology of previous research. The online survey firstly asked basic demographic questions such as age, gender and occupation. In the questionnaire prepared by the researchers, the parents were asked about their children's habits of using the device and their sleep status. The data obtained in the study were analyzed using SPSS 20.0 (Statistical Package for the Social Sciences) statistical package program. In the evaluation, descriptive statistics methods such as mean, standard deviation and frequency distribution were used.

Results

58% of the children participating in the study were male. It was found that the use time of the technological device during the day was 148.4 ± 123.8 minutes. During the day, it was found that the duration of television viewing was $47,6 \pm 44,7$ minutes, that of phone was $34,5 \pm 52,1$ minutes and that of tablet was $19,5 \pm 51,3$ minutes. 42.5% of the parents who participated in the study reported that their children had a technological device (television, mobile phone, etc.) in the bedroom. It was reported that the duration of device use was 9.2 ± 12.1 and the duration of sleeping dive was 22.9 ± 14.1 minutes before children were allowed to sleep. It was determined that the daily sleeping period was 9.5 ± 2.7 hours. According to 58% of parents, technological use of children is decreasing their sleeping times and 42.8% of children reported sleeping problems such as sleeping, late sleeping, late waking and nightmares. Forty-five percent of parents



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reported that they allowed their children to eat at home, or use technological devices to stay calm at home or abroad. They also reported that 27.5% of parents never let their children out, while 22.5% said it was less than 30 minutes.

Discussion

It was observed that 0-2 age group children were exposed to technological devices within 2.5 hours during the day. Nearly half of the families participating in the study reported that their children had at least one technological device in the bedroom. As a result, we think that sleep duration is longer and children sleep less than children in the same age group. It was also observed that half of the parents who participated in the study were encouraging their children to use technological devices and that their children were taking them out for less than half an hour or never. Today, children are growing up in the experience of using highly personalized technology; Therefore, parents should make efforts to ensure that children can apply and benefit from principles such as quality sleep and positive social interaction for healthy growth and development of children by making plans according to their age, health status, character and level of development. However, parents should be aware of their duties and responsibilities in order to balance the time of technology and other activities with the technology.

Conclusions

It was observed that 0-2 age group children were exposed to technological devices within 2.5 hours during the day. Nearly half of the families participating in the study reported that their children had at least one technological device in the bedroom. As a result, we think that sleep duration is longer and children sleep less than children in the same age group. It was also observed that half of the parents who participated in the study were encouraging their children to use technological devices and that their children were taking them out for less than half an hour or never. Today, children are growing up in the experience of using highly personalized technology; Therefore, parents should make efforts to ensure that children can apply and benefit from principles such as quality sleep and positive social interaction for healthy growth and development of children by making plans according to their age, health status, character and level of development. However, parents should be aware of their duties and responsibilities in order to balance the time of technology and other activities with the technology.

References

- Garrison, M. M., & Christakis, D. A. (2005). *A teacher in the living room?: Educational media for babies, toddlers and preschoolers: A background report prepared for Kaiser Family Foundation*: Henry J. Kaiser Family Foundation.
- Rideout, V., & Hamel, E. (2006). *The media family: Electronic media in the lives of infants, toddlers, preschoolers and their parents*: Henry J. Kaiser Family Foundation.



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Vandewater, E. A., Bickham, D. S., Lee, J. H., Cummings, H. M., Wartella, E. A., & Rideout, V. J. (2005). When the television is always on: Heavy television exposure and young children's development. *American Behavioral Scientist*, 48(5), 562-577.

Zimmerman, F. J., Christakis, D. A., & Meltzoff, A. N. (2007). Television and DVD/video viewing in children younger than 2 years. *Archives of Pediatrics & Adolescent Medicine*, 161(5), 473-479.



Radiofrequency Radiation Emitted From Mobile Phones on Brain

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Abstract

Since 1995, cell phones which are widely used in our country are now indispensable for daily life. This habit has come so far that human beings have met with a new "Fear": Nomophobia (No Mobile Phone Phobia). We are afraid today lose our mobile phones in anywhere. However, the health effects of wireless communication technologies were always ignored while enhancing the comfort of life. The sad thing in our country is to be the first in the European Countries in terms of mobile phone and wireless communication usage, which is announced by the Information Technologies Authority (BTK) every quarter of the year. The worst of all is that children are under ten year's old use of smart mobile phones frequently. Mobile phones or other wireless communication devices produce both "Radiofrequency radiation (RFR)" and "Extremely Low Frequency magnetic field (ELFMF)" in the environment when they are working. However, these two physical factors were already accepted as "Possible carcinogen" and classified as "2B" by the World Health Organization (WHO). Studies on the relationship between ELFMFs and childhood cancers have been made towards the end of the 1970s, and the issue has been addressed. However, the studies on the health effects of RFRs used in wireless communications were initially focused on the brain and followed by other organs. Epidemiological studies provided supportive evidence of increased risk for head and brain tumors. Therefore, the most important reason of the classifications of RFRs as 2B by WHO is high population of the studies that state relation between brain tumors and RFRs emitted from mobile phones or other wireless equipment. The animal and human studies we are still pursuing demonstrate that RFR and ELFMF are not as innocent as they seem. On the other hand, one of the eye-catching topics is the screen time of children. Due to the fact that researches on the screen time have been linked to various diseases, developed countries brought new legal regulations for the prohibition of the interaction of the children under the age of two. Relevant institutions recommend that screen time should not exceed two hours / day for children and adolescents (until the age of 18). In our country, these subjects are still not even discussed sufficiently. The attention of the public opinion to this issue is essential, and danger bells are ringing for our children. The attention of the public to this issue is essential, and danger bells are ringing for our children.

Keywords: Mobile phones, wireless communication, brain, screen time, diseases

Introduction

There is a linear relationship between the speed of urbanization and the increase in the number of utilities and equipment that use electricity in all areas of daily life. This means there are more electric currents and therefore more magnetic fields. When looking at



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the devices used that ease daily life, it is easy to see that almost all of them work with electricity. On the other hand, the majority of electrically operated wireless devices used in everyday life also generate electromagnetic fields in the environment. Electromagnetic waves or fields are not recognized by people because they cannot be seen with the eyes, cannot be heard with the ears, and cannot be felt. For this reason, when environmental problems are discussed, water or air pollution is generally considered. However, in the developed countries, the environmental problem called "Electromagnetic Pollution" has been discussed for many years as to kind of effects / problems it poses on the living things. Yet there still is not enough awareness of pollution in our country and it does not seem that the situation will improve. In the second half of the seventies, the first research results claiming that high voltage lines which produce "extremely low frequency magnetic fields (ELF)" may have a relationship with childhood cancers was published. In the early 2000s, after many years of research about this topic, the World Health Organization (WHO) has taken "ELF" in the "Probable carcinogen" group, "2B". Since the nineties, the health effects of the mobile phones, base stations, etc. which create "radiofrequencies" in the environment have also been investigated. It has been suggested that the results of the studies are not innocent at all. With the increasing amount of publications finding that these people may have different health problems including brain tumors, in 2011 World Health Organization (WHO) put this concern in the precautionary principle group "2B". Many of today's people who are addicted to wireless communication either have no knowledge of the health risks, or like those smoking cigarettes, they are insensitive to the importance of the matter. Electromagnetic pollution sources are not just limited to the physical factors mentioned above. It should not be forgotten that uncontrolled or careless use of devices that generate electromagnetic waves, such as man-made ultraviolet, infrared, laser, X-rays, gamma rays, etc., may also contribute to such pollution. Therefore, it can be said that the rate of increase in the levels of "electromagnetic pollution" in cities is a directly proportional to the rate of urbanization. It may be worth comparing the proportion of "electromagnetic pollution" between present-day and 50 years ago. Could it be possible that health problems we are encountering presently may be caused by "Electromagnetic pollution"? Who is the most vulnerable to this type of pollution, and which sectors need to be trained the most in this regard? Indeed, the answer is children and adolescents.

With each increase in the speed of urbanization, it means more televisions, more microwave ovens, more hair dryers, more laptop computers, more wireless internet, more base stations, more mobile phones, more use of tomography and ionizing radiation sources, and the higher ultraviolet and infrared level. This also means that people interact with higher magnetic fields, radiofrequency and other radiation at the same time. All these explanations indicate that people living in big cities, especially children, will be more affected by the "Electromagnetic pollution". Even though adults may show insufficient sensitivity to the issue, it is our primary duty to protect the children, which are our future. Of course technological developments aid mankind greatly in countless fields. It should be remembered that raising conscious generations about electromagnetic pollution means healthy generations and therefore this provides important contribution to countries' health economies. For this reason, this presentation



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focused on the brain tumor risks of radiofrequency radiation emitted from mobile phones to attract attention of parents to this important subject.

Studies performed on Relation between Brain Tumors and Radiofrequencies

Globally, the number of mobile phone subscriptions was reported to be ~ 700 million in 2000 and increased rapidly to over 7 billion in 2015^{1,2}. This widespread use of mobile phones triggered anxiety about the possible adverse health effects of radiofrequency exposure generated by mobile phone devices. Therefore, a series of epidemiological studies has been conducted worldwide, to examine the potential relationship between mobile phone use and health impairment, focusing on brain tumor risk in both adults and children². However, it is stated that “The use of digital technology has grown rapidly during the last couple of decades. During use, mobile phones and cordless phones emit radiofrequency (RF) radiation. No previous generation has been exposed during childhood and adolescence to this kind of radiation. The brain is the main target organ for RF emissions from the handheld wireless phone. An evaluation of the scientific evidence on the brain tumor risk was made in May 2011 by the International Agency for Research on Cancer at World Health Organization. The scientific panel reached the conclusion that RF radiation from devices that emit nonionizing RF radiation in the frequency range 30 kHz–300 GHz is a Group 2B, that is, a “possible” human carcinogen. With respect to health implications of digital (wireless) technologies, it is of importance that neurological diseases, physiological addiction, cognition, sleep, and behavioral problems are considered in addition to cancer”³. It is also stated that “Information technology addiction was reported among up to almost 20% students, and the benefits in education are largely unproven”^{3, 4}. On the other hand, Gonzales-Rubio et al investigated the correlation between exposure to radiofrequency electromagnetic field (RF-EMF) in the city of Albacete (166,000 inhabitants, southeast Spain) and the incidence of several cancers with unspecific causes (lymphomas, and brain tumors). They found little correlation between personal exposure to RF-EMF and the incidence of cancers with an unspecific cause which were analyzed in the entire city (gliomas, meningiomas and lymphomas)⁵. Momoli et al undertook a re-analysis of the Canadian data from the thirteen-country INTERPHONE case control study (2001-2004), which evaluated the association between mobile phone use and risk of brain, acoustic neuroma, and parotid gland tumors. They found little evidence of an increase in the risk of meningioma, acoustic neuroma, or parotid gland tumors in relation to mobile phone use⁶. It is also reported that “The IARC cancer classification includes all sources of RF radiation. The exposure from mobile phone base stations, Wi-Fi access points, smart phones, laptops and tablets can be long-term, sometimes around the clock, both at home and at school. For children this risk may be accentuated because of a cumulative effect during a long lifetime use. Developing and immature cells can also be more sensitive to RF radiation”⁷.



Some Animal Studies Performed by Our Group

We performed many of studies on the effect of mobile phone exposure and brain. However, we will summarize the results of some. For instance, we exposed rat heads to 900 MHz RF exposure 2h/d (7 days in a week) for 10 months. We observed that the final score for apoptosis, total antioxidant capacity and catalase in rat brain might be altered by 900MHz radiation produced by a generator to represent exposure of global systems for mobile communication (GSM) cellular phones⁸. However, we also exposed rats to 100- and 500- μ T Extremely Low Frequency Magnetic Fields (ELF-MFs; 50 Hz) for 2 h/day for 10 months, which are the generally accepted safety standards for public and occupational exposures. The results of our study indicated that although protein carbonyl (PC) and malondialdehyde (MDA) levels were increased by the exposure to 100- and 500- μ T ELF-MFs Beta Amyloid Protein was not altered in brain. Therefore we concluded that long-term 100 or 500 μ T ELF-MF has potential to alter both PC and MDA levels in brain⁹. Similarly, we investigated the long-term exposure of 100 and 500 μ T ELF-MF affect on active-caspase-3 activity in brain, which is a well-known apoptotic indicator. We concluded that apoptosis was not altered by long-term ELF-MF exposure, while both 100 and 500 μ T ELF-MF exposure induced toxic effect in the rat brain by increasing oxidative stress and diminishing antioxidant defense system¹⁰. In 2015, we exposed rat heads to 900 MHz and 2.4 GHz (Wi Fi) for one year to observe effects of RFs on the expression of some of microRNAs in brain. We observed that Both 900 MHz and 2.4 GHz RF radiation has potential to alter the expression of some miRNAs^{11, 12}. On the other hand, we observed that prolonged radiofrequency radiation emitted from Wi-Fi devices induce DNA damage in some of tissues¹³. By the way, we summarized the effects of RFs emitted from wireless technologies on oxidative stress¹⁴.

Conclusion

Mobile phones and other wireless communication devices generate both "Radiofrequency radiation (RFR)" and "Extremely Low Frequency magnetic field (ELFMF)" in the environment when they are operating. Therefore, effects of RFR and ELFMF should be accounted when we discussed the health effects of mobile equipment. There are many contradictive studies, which are stated opposite results. However, it has been also remembered that both ELFMF and RFRs have been already accepted as "Possible Carcinogen (2B)" by the World Health Organization (WHO). The current situation indicates that these two physical factors are not so innocent. Being cautious is the most ambitious way until the conclusions of the topic become finalize. With each increase in the widespread use of mobile equipment means more televisions, more microwave ovens, more hair dryers, more laptop computers, more wireless internet, more base stations, and more mobile phones. This also means that people interact with higher magnetic fields, radiofrequency and other radiation at the same time. Even though adults may show insufficient sensitivity to the issue, it is our primary duty to protect the children, which are our future. Of course technological developments aid mankind greatly in countless fields. It should be remembered that raising conscious generations about electromagnetic pollution means healthy generations and therefore



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this provides important contribution to countries’ future health economies. However, in spite of the IARC evaluation little has happened to reduce exposure to RF fields in most countries⁷.

References

1. International Telecommunication Union ICT STATISTICS Home Page (Accessed on 1 June 2016). <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>.
2. Kiyohara, K., Wake, K., Watanabe, S., Arima, T., Sato, Y., Kojimahara, N., Taki, M., Cardis, E., Yamaguchi, N. (2018). Long-term recall accuracy for mobile phone calls in young Japanese people: A follow-up validation study using software-modified phones. *Journal of Exposure Science and Environmental Epidemiology* 28: 166–172.
3. Hardell, L. (2018). Effects of Mobile Phones on Children’s and Adolescents’ Health: A Commentary. *Child Development*, 89 (1): 137–140.
4. Spitzer, M. (2014). Information technology in education: Risks and side effects. *Trends in Neuroscience and Education*, 3(3–4), 81–85. 2014.
5. Gonzalez-Rubio, J., Arribas, E., Ramirez-Vazquez, R., Najera, A. (2017). Radiofrequency electromagnetic fields and some cancers of unknown etiology: An ecological study. *Science of the Total Environment* 599–600: 834–843.
6. Momoli F., [Siemiatycki J.](#), [McBride ML.](#), [Parent ME.](#), [Richardson L.](#), [Bedard D.](#), [Platt R.](#), [Vrijheid M.](#), [Cardis E.](#), [Krewski D.](#) (2017). Probabilistic Multiple-Bias Modeling Applied to the Canadian Data From the Interphone Study of Mobile Phone Use and Risk of Glioma, Meningioma, Acoustic Neuroma, and Parotid Gland Tumors. *AMERICAN JOURNAL OF EPIDEMIOLOGY*. 186 (7): 885–893.
7. Hardell L. (2017). World Health Organization, radiofrequency radiation and health - a hard nut to crack (Review). *International Journal of Oncology*. 51: 405-413.
8. Dasdag, S., Akdag, M.Z., Ulukaya E., Uzunlar, A.K., Ocak, A.R. (2009) Effects of Mobile Phone Exposure on Apoptotic Glial Cells and Status of Oxidative Stress in Rat Brain. *Electromagnetic Biology and Medicine*. **28: 4; 342-354**.
9. Akdag, M.Z., Dasdag, S., Cakir, D.U., Yokus, B., Kizil, G., Kizil M. (2013). Do 100 And 500 μ T ELF Magnetic Fields Alter Beta Amyloid Protein, Protein Carbonyl And Malondialdehyde In Brain? *Electromagnetic Biology and Medicine*, 32(3): 363–372.
10. [Akdag, M.Z.](#), [Dasdag, S.](#), [Ulukaya, E.](#), [Uzunlar, A.K.](#), [Kurt, M.A.](#), [Taşkın, A.](#) (2010). Effects of Extremely Low-Frequency Magnetic Field on Caspase Activities and Oxidative Stress Values in Rat Brain. *Biol Trace Elem Res*. **138 (1-3): 238-249**.
11. Dasdag, S., Akdag, M.Z., Erdal, M.E., Erdal, N., Ay, O.I., Ay, M.E., Yilmaz, S.G., Tasdelen, B., Yegin, K. (2015). Long term and excessive use of 900 MHz radiofrequency radiation alter microRNA expression in brain. *Int J Radiat Biol. International Journal of Radiation Biology*, April 2015; 91(4): 306–311.
12. Dasdag, S., Akdag, M.Z., Erdal, M.E., Erdal, N., Ay, O.I., Ay, M.E., Yilmaz, S.G., Tasdelen, B., Yegin K. (2015) Effects of 2.4 Ghz Radiofrequency Radiation Emitted From Wi-Fi



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- Equipment On microRNA Expression In Brain Tissue. *Int J Radiat Biol.* 91(7): 555–561.
13. Akdag, M.Z., Dasdag, S., Canturk, F., Karabulut, D., Caner, Y., Adalier, N. (2016). Does prolonged radiofrequency radiation emitted from Wi-Fi devices induce DNA damage in various tissues of rats? *Journal of Chemical Neuroanatomy* 75: 116–122.
14. Dasdag, S., Akdag, M.Z. (2016). The link between radiofrequencies emitted from wireless technologies and oxidative stress. *Journal of Chemical Neuroanatomy* 75: 85–93.



Evolution of Digital Games and Social Media Roots Mobil Dijital Oyunların Gelişimi ve Sosyal Medya Uzantıları

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Abstract

Since the beginning of 2000; the development of computing and internet technologies, led the tremendous growth of the digital game industry which become a key player in the new media ecosystem. In the era of Web 3.0, digital game producers sell their games through online markets; while story and characters remediation in social media platforms enlarge their market share. The efforts of companies point the professional value of social media for connecting games and players. The aim of this study is to examine digital games social media platforms; in order to expose and map digital game based social media ecosystem. To explore this environment; games from Google Playstore in the category of “under 5 age” were examined using web-harvesting technique along with content analyzing methodology. Within this context, 32 free online games from 17 different game companies were analyzed in terms of company ownership, platform statistics and their social media contents. As the social media is one of the primary influence of the purchasing decision; viral marketing strategies from these platforms reach the absolute beginner gamers and potentially their parents or other caregivers. Results reveal that game companies remediate new game content on online network. This strategy creates a new ecosystem; where child gamers are surrounded by fragmented and modular game contents from different social media platforms.

Key Words: Digital Game, Social Media, Game Industry, Digital Network

Özet

Dijital oyun endüstrisi 2000’li yıllardan itibaren bilgisayar ve internet teknolojisinde yaşanan gelişmelerle paralel olarak hızla gelişmiş ve yeni medya ekosisteminin önemli bir parçası haline gelmiştir. Özellikle Web 3.0 döneminden itibaren mobil oyun yapımcıları bir yandan geliştirilen oyunları sanal marketler üzerinden satışa sunarken, bir yandan da bu oyunların öykülerinden ve karakterlerinden üretilen yeni içerikleri sosyal medya üzerinden paylaşmaktadır. Bu çalışmanın amacı okul öncesi çocuklara yönelik geliştirilen mobil oyunların sosyal medya uzantılarını ve internet ortamında oluşturulan dijital oyun ağlarını görünür kılarak; mobil oyun merkezli sosyal medya ekosistemlerini çözümlenektir. Saha araştırmasında Google Playstore’da 5-6 yaş oyun kategorisinde satışa sunulan oyunların yapımcı firmalarına odaklanılmıştır. Araştırmada mobil oyun yapımcılarının kurumsal sosyal medya platformlarından web hasatçılığı yöntemi kullanarak veri toplanmış ve içerik analiz yöntemi kullanılarak incelenmiştir.



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Anahtar Kelimeler: Dijital Oyun, Sosyal Medya, Oyun Endüstrisi, Dijital Ağlar

Introduction

Digital game companies have stepped into a new era with the use of new generation operating systems on mobile phones and tablet computers. With the development of apps and digital games specific to these platforms, the mobile game industry grew rapidly in the last ten years. In 2018, mobile games for smartphones and tablet computers reached 63.2 billion dolar and accounted for 47% of the total digital gaming market (Newzoo, 2018a). The same year the global mobile application revenues reached 92.1 billion dollars in which 76% of this revenue comes from mobile games. In 2021, total mobile application revenues are expected to reach 139.6 billion dolar (Newzoo, 2018b).

In Turkey mobile applications and mobile / social games have a great importance for local game companies. Due to the low entry barriers in the market, small firms and individual game developers can compete with large firms and get a market share (Kalkınma Bakanlığı, 2015: 21). On the other hand the digital game industry in Turkey is still at the beginning of its development process. In the study by Binark and Bayraktutan Sütçü (2008); the main problems of digital game Industry in Turkey were described as “High cost of game design and development, the requirement of the experienced workforce, the lack of public policies in Turkey to promote game software, shortage of broadcasting, distribution and marketing activities after game development”. The report published by Ankara Development Agency (2016) underlined that similar problems still continue in the game industry. The report note that the level of competition of Turkey game industry on an international scale is still questionable. In the same report, a survey with 51 game developers / companies in Ankara was exploited, where a significant majority (46%) stated that their marketing strategies in the sector were insufficient.

Mobile games and social games differ in many ways from games developed for computer and game consoles. For example Social media platforms such as Facebook, have become a platform for both hosting and sharing digital games (Hansen, 2016: 380-386). Youtube is an important digital channel for amateurs, who would like to become “internet celebrity” by increasing their social media followers (Miller, 2012). Youtube offers a digital environment where gamers can become famous by publishing their gaming performances. In this sense, the most watched user-generated video content on the Internet is “Let’s Play Videos” (Postel, 2017). Such videos are mainly webcast on *Youtube Game ve Twitch TV and form mass game audience.*

The aim of this research is to study the social media extensions of mobile games developed for preschool children and map the digital gaming networks created on the

internet. In this context the research exploits how game producers and game companies use social media platforms.

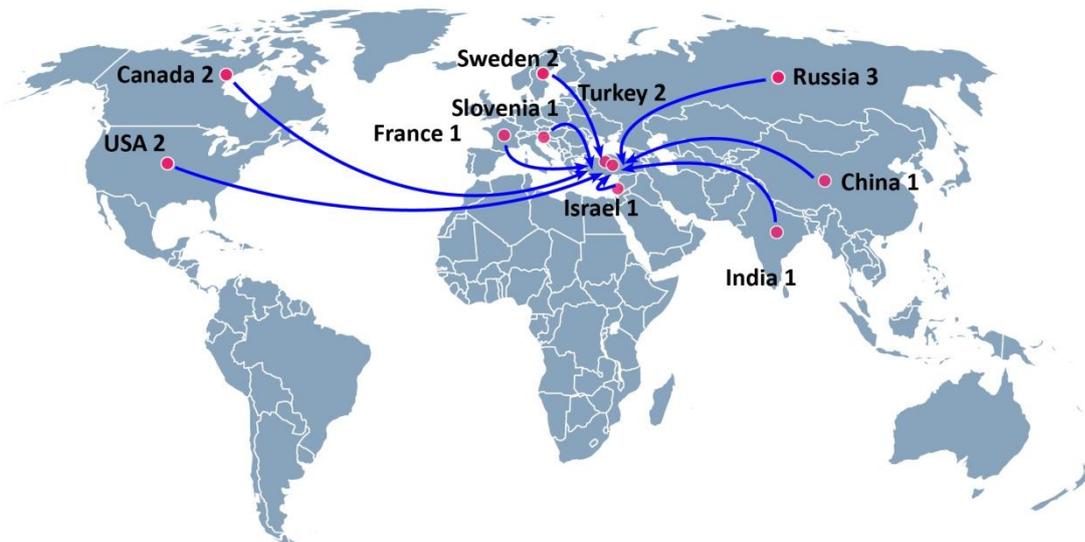
Scope and Method of Research

The study focused on developers of free games in the 5-6 age game category in Google Play Store. The research area constitutes the web sites and the social media accounts of 17 different companies that meet the stated criterias. In the first phase of the study, corporate websites and social media accounts of these game companies were recorded using web harvesting method. Data collection was made between March 5, 2018 and March 6, 2018 and 728 display interfaces of these platforms were collected. The images obtained following this process were examined using the content analysis method.

Preliminary Findings

According to the data obtained from the “Google Playstore 5-6 years game category”, 32 games are developed by 17 companies from 10 different countries. In total, these companies produced 376 games in different categories. Looking at the pattern within the creative industries, it was determined that the producers did not only consist of game companies, but also television organizations and independent designers acted as mobile game producers.

Image 1. Global Distribution of Games Producer in Turkey Google Playstore'da 5-6 Age Games Category





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Focusing on the social media ecosystem created by digital gaming companies, most of the companies were found to use Youtube and Twitter platforms. According to the appearance and the distribution along with the years, Twitter was the first platform which was then by youtube (Table 1).

Table1. Social Media Platforms of Digital Gaming Companies by Years.

	Youtube	Twitter
App Family Kids - Game	2012	2011
Bini Bambi	2014	2013
Bubadu	2015	
Budge Studios	2010	2010
Choloepus Apps		2015
Dr. Panda	2016	2010
Forqan smart tech		
L'escapadou	2010	2010
Little Ones Learning Game	2015	2016
MAGE Studios	2012	
My Town Games Ltd	2015	2015
Papumba	2013	2014
Sago Mini	2013	2013
Toca Boca	2011	2010
Greyspings	2013	2013
TRT	2012	2010
Cartoon Network	2011	2016

In the ecosystem created by digital game makers (with separate TV channels) through social media platforms, the highest number of followers and subscribers were on the Youtube platform (245.156), followed by Twitter (26.000) and Instagram (51.000). Meanwhile, due to the fact that Cartoon network and TRT are broadcasting channels, it is seen that compared to other game producer companies these TV channels share more videos on Youtube. These TV channels have large number of Youtube subscribers, but most of the videos are not associated with digital games (Table 2).

Table2. Social Media Account of Digital Game companies

	Youtube			Twitter				Instagram		
	Subscribers	Total Videos	View	Follower	Following	Twitter	Like	Sent	Followers	Follow
Digital Game Producers	245.156	871	584.234.743	26.000	12.822	12866	10.745	2948	51.403	3433
(Excluding TV channels)										
TRT Kids	1.135.035	2860	806.022.664	1690	37	5711	905	888	2280	8
Cartoon Network	279.234	832	145.860.379	132	402	710	390	136	29400	6



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Based on the preliminary findings, the comment / forum sections of Twitter, Facebook, Instagram, Youtube and virtual markets were seen to form social extensions of mobile games. The games produced by the gaming industry are transformed intensively into social media contents. The forum sections on these platforms are mainly used to share game strategies and share opinions on games. However, the messages in this social media platforms can contain insults and hate speeches.

References

Ankara Kalkınma Ajansı (2016). *Ankara Dijital Oyun Sektörü Raporu*. http://www.ankaraka.org.tr/tr/dijital-oyun-sektoru-raporu_3414.html.

Binark M., Bayraktutan-Sütçü, G. (2008). *Kültür Endüstrisi Ürünü Olarak Dijital Oyun*. İstanbul: Kalkedon.

Hansen, D. (2016). *Video Game History - Game ON!*, Macmillan Publishing Group.

Kalkınma Bakanlığı (2015). *2015-2018 Bilgi Toplumu Strateji ve Eylem Planı*. <http://www.bilgitoplumustratejisi.org/tr/doc/8a9481984680deca014bea4232490005>

Miller, K. (2012). *Playing Along*, ABD: Oxford University Press.

Newzoo (2018a). *2018 Global Games Market, Per Device & Segment with year on year growth rates*. <https://newzoo.com/key-numbers/>

Newzoo (2018b). *2016-2021 Global App Revenues*, <https://newzoo.com/key-numbers/>

Postel, C. (2017). "Let's Play": YouTube and Twitch's Video Game Footage and a New Approach to Fair Use. *Hastings Law Journal*, 68: 1169-1192.



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Children and Game as Techno-Commodity

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Abstract

With the help of the new digital technologies, which included traditional media like radio, television, and cinema, gaming has been shaped by global leisure time industry in an ever-increasing scale for the whole society including children. With these developments, all individuals spend their times on new media. In our present day where an “*Internet Generation*”, which is highly dependent on computers, has emerged, children see the computer as a part of life, even as their friends in their homes, and spend most of their time by playing games on the computer.

Along with these developments, children are watching less television compare to the past and spending more time on the computer. This new generation of children uses computers to learn, to have fun, to shop, to communicate and to play games. In other words, for today's children, new media circles for this internet generation are seen as playgrounds, and even these areas where children become children. However, of course, it is not right to agree with this view that new media circles have made the internet as a playground for children. The leisure time including the games has been industrialized since the XX. century. Specialized leisure-time industries, such as digital games, are creating entertainment as a commodity to sell. Moreover, with these developments, playing game has become cheaper and so many people can access it without much effort. These also transformed the place, hardware, clothes and activities required for the game into a more desired manner; making it a commodity where children can find children at a certain price in the market.

Douglas Kellner describes the present age we are living in as the “techno-capitalism” age of knowledge, information, computerizing and automation in cooperation among each other. In techno-capitalism age, technology is a crucial importance. Indeed, since the 1980, knowledge, information, education, and entertainment have started to be commodified, and have been subjected to capitalist profit and controlling. This turned out to be a shift of computer information services into libraries as an information source; commodification of education programmes that can be purchased by money and the replacement of paid television by “free” televisions. In other words, information on computers has been replaced the library, and the knowledge and information has become a commodity and has gone under the control of computer programs. In this respect, Kellner claimed that all technological products worked with the change value of



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information, knowledge and entertainment and were transformed into “techno-commodity”. Based on this approach of Kellner, the present paper considers the game as a techno-commodity.

For this reason, this paper will firstly deal with the techno-commodity concept, which defines the conversion of the game in techno-capitalism era and the techno-capitalism concept in which new communication technologies have the primary importance. Then, the meaning of game as a techno-commodity and its effects on children will be discussed with a theoretical and critical perspective.

Keywords: children, game, new media, leisure, techno-meta

Introduction

With the help of the technological developments or digitalizing, which provide everyone with free time, leisure time opportunities have been adapted to these developments and leisure time activities have become more home-centric in time. This situation has caused that television as well as other audio and visual re-production hardware, telecommunication and computer technologies and new game forms, are included in our social lives. Also, with the help of this new media or new digital technologies, which included traditional media like radio, television, and cinema, gaming has been shaped by global leisure time industry in an ever-increasing scale for whole society including children.

With these developments, children as well as whole of the society spend their times on these new media. In our present day where an “*Internet Generation*”, which is highly dependent on computers, has emerged, children see the computer as a part of life, even as their friends in their homes, and spend most of their time by playing games on the computer.

For this reason, this paper will firstly deal with the techno-commodity concept, which defines the conversion of the game in techno-capitalism era and the techno-capitalism concept in which new communication technologies have the primary importance. Then, the meaning of game as a techno-commodity and its effects on children will be discussed with a critical perspective.

Techno-Capitalism and Game as a Techno-Commodity

Douglas Kellner describes the present age we are living in as the techno-capitalism age of knowledge, information, computerizing and automation in cooperation among each other. In techno-capitalism age, technology has a crucial importance. Indeed, with the help of technology, production has become globalized, technological inventions fastened communication and reduced the costs. New communication technologies have created



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global mounting lines, and have created a new capitalist order in which the cheap and plenty labor force may travel all over the world by doing more than that could be done by states with the help of global capital. In this techno-capitalism order in which the capital presents information and entertainment together to masses with the help of the developing capital, computerizing, digitalizing and technology have gained importance at a global level.

Indeed, since the 1980, knowledge, information, education, and entertainment have started to be commodified, and have been subjected to capitalist profit and controlling. This turned out to be a shift of computer information services into libraries as an information source; commodification of education programmes that can be purchased by money and the replacement of paid television by “free” televisions. In other words, information on computers has been replaced the library, and the knowledge and information has become a commodity and has gone under the control of computer programs. In this respect, Kellner claimed that all technological products worked with the change value of information, knowledge and entertainment and were transformed into “techno-commodity”. Based on this approach of Kellner, the present paper considers the game as a techno-commodity.

In this respect, Kellner claimed that all technological products worked with the change value of information, knowledge and entertainment and were transformed into “techno-commodity”. Nearly all of these techno-commodities are already under the control of the market. For this reason, techno-capitalism caused that the hegemony of the capital increased in social and individual life (Kellner, 1992: 187). Based on this approach of Kellner, the present paper considers the game as a techno-commodity.

Today, the structures that belong to capitalism are becoming digitalized, and the materialistic quality is in a constant transition to electronic units from file folders. Unfortunately, games have had their share from these developments, and have been carried to digital media in cooperation with technology.

Game, which is a part of a very big leisure time industry, creates entertainment and recreation to sell as a techno-commodity. In this way, the house has become a multimedia cultural realm, and the Internet has become a standard domestic expense. Today, too much money is spent on leisure time industries that include the game industry in it. Furthermore, game and entertainment has been purchased in a cheaper manner without any extra efforts with the help of the new media like television, radio, and cinema, which collect the leisure time activities at home including games. Similar to this, with the help of new media technologies, game has become an activity that may be performed by sitting at home and is no longer an experience like art, sports and traveling. For this, the game industry that has a turnover rate of millions of dollars has organized the place, hardware, clothing and activities that are required for game in a way that it desired, and has made game to become a techno-commodity which may be purchased at a certain price in the market. For this reason, the game experience has become a commodity and has become homogenous.



Game and Children in the Age of Techno-Capitalism

Game is one of the leisure time activities like reading, hobbies, sports and relaxation, which are performed as a sole purpose and not in an economic compulsory manner. Game moves humans away from ordinary time, place and rules, and helps the individual to develop and express the hidden sides in him/her. Game is located outside the requirements, obligations and duties that are specific to daily life, and is a field that develops the skills of an individual in the art of living. Game opens a place for the individual who wants to get rid of the demands of the personality that cover everything to fulfill individuality (Reisman, 1969: 266).

Freud, who analyzed the game phenomenon in terms of psychoanalysis, defined it as a concept outside the compulsory realm. According to Freud, the only field that is not under the control of reality principle in conscious is the skill of imagination, which represent the source of children’s games and which appears in later periods of the individuals life at the level of art. In other words, game and imagination do not accept the limitations set by the reality principle on freedom and happiness, both have a critical structure because they do not make it be forgotten to demand for the better one, in other words, because they remind it (Marcuse 1968: 169).

According to Johan Huizinga, who claimed that the culture was born from game, “*culture is the thing that is played from the very beginning*”. In primitive societies, the activities performed to cover the compulsory needs like hunting were performed in the form of games. In such societies, game is included in the form of interpreting life and the world. For this reason, culture has developed in the game medium. Worshipping, poems, music, dance, and science have been included in primitive periods as a game (Huizinga 1995: 86-88).

As seen above, both Huizinga and Freud considered the game as a relaxation element that belong only to Sundays of the life aside from the serious activities, and for this reason, they think that there are differences between game activities and serious activities. However, in the techno-capitalism period, new media technologies have caused that the relations between public sphere and private sphere, and working and leisure time. In other words, today, game and serious things are lived within one another. As it is well-known, the limit between private and public sphere has become clearer with the modernization process. Homes and families of people were defined as the private sphere of people, and the environment outside homes are defined as public sphere. With modernization, the mass communication devices that were developed also contributed that the distinction between private and public sphere/game and serious things in life. However, with the digital technologies that have been included in our lives in techno-capitalism period, a confusion in the limit of distinction between the private and public sphere attracted attention. With the opportunities brought with the Internet, humans who worked in many professions started to move work place to homes, and thus, similar to the pre-modernism period, the homes, in other words, homes i.e. private spheres have become to be used as workplace. Social media, which has been developed



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on the Internet, has brought the opportunity of playing games or the time for playing games as if invalidating the borders between spatial and temporal realms. The situation is the same for children. In previous periods, while the time that was allocated for education was a serious time period in which children spent to learn their responsibilities of adults in future, leisure time was a time period that was not cared much by adults. Today, parents try to fill in the extracurricular time of their children with productive activities.

Today, the leisure time of children, which is cared for as important time by adults, has become easy to make use of in terms of learning potentials they have. In technocapitalism age, the distinction between the working and leisure time has become blurry for adults, which is also the case for their children. According to this leisure time concept, leisure time is a time period which requires that entertainment and education are merged in one another.

The most typical example for this new leisure time concept, which requires that entertainment and education are merged in one another, appear before us in the games played by children especially in digital media and as the new media technologies. The authors investigating the relation between new media technologies and children report that children spend more time before the computer and watch less television when compared with the previous times. Again, according to many authors, children in this new generation use the computer for learning, entertaining, shopping, communicating and playing games. Some of these authors affirms the relation between the new media and children, and even they see cyber realms as the gaming areas of the Internet Generation and even as area where children find themselves. In this respect, in other words, when the media-centered technologic developments are considered in terms of children, children who lived in 1960s were the generation of the television, those who lived in 1970s were the generation of videos, those who lives and 1980s were the generation of Nintendo, and those who lived in 1990s were the generation of the Internet(Livingstone, 2000:14). However, when we consider the issue in a children and game-centered perspective, the situation is not heart-warming at all. Children do not play in the streets freely, which was the case in the past and digital platforms disrupt the meaning and contents of games.

Game is “an activity that occurs outside the financial benefit and requirement by obeying the rules consented freely in line with a clear order within the limits of time and free will. No matter whether it is a sacred game or an ordinary festival, ritual and an entertaining, the medium of the game consists of fascination and excitement. Narration and tension accompany activities and these activities bring joy and relaxation with them” (Huizinga 1995: 164).

However, as mentioned above, game, which has become a techno-commodity today, brings fatal outcomes instead of fascination with money and excitement in digital media. In addition, digital games constitute a very important context of the labor exploitation in



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our present world. About this topic, the authors who used the concept “game-labor” point out to the collapse of the distinction between the working and game time. From now on, modern humans are expected to entertain in working time and to spend the time for entertaining in a productive manner. “Capitalism has joined labor and game with a destructive dialectic”. Today, the techno-commodity of game, and the exploitation of game labor in a comfortable manner by the Internet companies in digital media and making profits from this situation and accumulating their profits are the results of the fact that labor is considered as game in digital media. Game has become commodity, and there is no leisure time left that has not been exploited by capital (Fuchs 2015: 188-191).

Conclusion

As a conclusion, it is not accurate to agree with the viewpoint that defends that the present age has become a game field for children of the digital age with the use of the Internet, the new media sources in their free times. Because the games that are prepared for children or for adults in the digital media are presented to the masses by the global entertainment industry. Children pay the price of these games and participate in them in a passive manner. However, game is an activity that requires a creativity and participation of the household at homes. Today, the new media technology eliminates these gatherings and leads to a digital isolation between the family members.

In addition, games have been purchased by this industry in a cheap way without any extra efforts. Today, the place, hardware, clothes and activities have been organized in the way that was desired by games and has become a commodity which may be purchased with a certain price in the market by children and by ordinary people. Unfortunately, children are the parts and consumers of the game industry, which has a turnover rate of million dollars with magazines, programs, films, cartoons, videos and computer games, game characters for children.

When it is considered in terms of communication technologies, the transition from television to interactive world is extremely important for the new *Internet generation* who does not want to be mere listeners and observers and who want to become more active users. However, it must be kept in mind that digital games that have become a techno-commodity for today’s children who live a limited childhood with limited game fields and with over-programmed lives cannot replace green areas, game areas, parks and real friendships.

References

- Aydođan Filiz(2000). **Medya ve Serbest Zaman**. İstanbul: Om Yay.
- Fuchs, Christian(2015). **Dijital Emek ve Karl Marx**. Çev: Senem Ođuz-Tahir Emre Kalaycı. İstanbul:Notabene Yay.
- Huizinga, Johan(1995). **Homo Ludens**, Çev: Mehmet Ali Kılıçbay, ist: Ayrıntı Yay, 1995.



International Child and Information Safety Congress
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Livingstone, Sonia(2002).**Young People and New Media**. London: Routledge.

Marcuse. Herbert(1968). **Aşk ve Uygarlık**. Çev: Seçkin Çağan. İst: May Yay.

Reisman David(1969). **The Lonely Crowd**. New Haven: Yale University Press.



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Dyslexic Children and Digital Games: Literature Review
Disleksili Çocuklar ve Dijital Oyunlar : Alanyazın İncelemesi

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Abstract

There is a period in which digital games are now being discussed as a learning material, beyond having fun or spending time. Digital games as a learning material; design, development, use of education and its effects are subject to different studies. Digital games in the learning process of children with dyslexia have a critical place in this context. Dyslexia is a reading difficulty (Hultquist, 2006) that is classified as a subcategory of specific learning disability under special education categories (Güzel-Özmen, 2015: 341). Dyslexic children are taught to improve their literacy and literacy competencies if they are trained through privatized programs. Therefore, development of learning environments and methods appropriate to the characteristics of children with dyslexia is an important field of study. Digital games, on the other hand, are one of the most discussed issues in terms of the effects on the learning of children with dyslexia, considering the attractive interaction processes they offer to children. Some of these researches with the subject of dyslexic children and digital games have been examined here to obtain data on the power of digital games to meet the educational needs of children with dyslexia.

A document analysis has been carried out with the criteria determined in line with the aim of this study. *Web of Science* and *Science Direct* databases were searched. A total of 37 articles have been reached. Findings; “dyslexia and digital game” have been on the rise in recent years. While in studies, some of the games are being developed by researchers, some games are existing. The researchers; education, cognition, special education, psychology, communication, neuropsychology, neuropsychiatry, engineering and pediatrics, and many studies have been observed to be multidisciplinary. In studies, it has been reported that digital games are effective for dyslexic individuals, and the dependent variables examined are supported on the positive side. When the teaching strategies used in the games are examined, it is noted that they focus on some strategies.

Keywords: dyslexia, digital game, special education, literature review



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Özet

Dijital oyunların artık, eğlenmek ya da vakit geçirmenin ötesinde, öğrenme materyali olarak işlevinin tartışıldığı bir dönem yaşanmaktadır. Bir öğrenme materyali olarak dijital oyunların; tasarımı, geliştirilmesi, eğitim amaçlı kullanımı ve etkileri farklı çalışmalara konu olmaktadır. Disleksili çocukların öğrenme süreçlerinde dijital oyunlar ise bu kapsamda, kritik bir yere sahiptir. Disleksi, özel eğitim kategorileri altında ele alınan özgül öğrenme güçlüğü'nün alt kategorisi olarak sınıflandırılan nörolojik temelli (Hultquist, 2006) bir okuma güçlüğüdür (Güzel-Özmen, 2015:341). Disleksili çocuklara, özelleştirilmiş programlarla eğitim verildiği takdirde, bu çocukların okuma ve yazma yetkinliklerinin iyileştiği belirtilmektedir. Dolayısıyla disleksili çocukların özelliklerine uygun öğrenme ortam ve yöntemlerinin geliştirilmesi önemli bir çalışma alanıdır. Dijital oyunlar ise, çocuklara sundukları cazip etkileşim süreçleri düşünülerek, yine disleksili çocukların öğrenmesi üzerindeki etkileri açısından, çokca üzerinde durulan konulardan biridir. Disleksili çocuklar ve dijital oyunlar temalı bu araştırmaların bir kısmı, dijital oyunların disleksili çocukların eğitim gereksinimlerini karşılamadaki gücüne dair veriler elde etmek amacıyla burada incelenmiştir.

Çalışmanın amacı doğrultusunda, Web of Science ve Science Direct veritabanları belirlenen anahtar kelimeler ile taranmış ve ilk taramada 37 makaleye (tam metin) ulaşılmıştır. Makaleler; yayın yılı, araştırmacılarının uzmanlık alanları, çalışmanın amacı, bağımlı değişkenleri, verilerin toplanması, ele alınan oyunun özellikleri, oyunda kullanılan stratejiler vb. açılardan incelenmiştir.

İncelemeler; disleksi ve dijital oyuna ilişkin çalışmaların son yıllarda artış eğiliminde olduğunu göstermektedir. Çalışmalarda hazır oyunların ya da araştırmacılar tarafından geliştirilmiş oyunların kullanıldığı, bazı hazır oyunların kullanımında ise yoğunlaşma olduğu görülmüştür. Araştırmacıların; eğitim, biliş, özel eğitim, psikoloji, iletişim, nöropsikoloji, nöropsikiyatri, mühendislik ve pediatri alanlarından oldukları ve çoğu çalışmanın çok disiplinli gerçekleştirildiği gözlenmiştir. Çalışmalarda genellikle, disleksili bireyler için dijital oyunların etkili olduğu, üzerinde etkisi incelenen bağımlı değişkenlerin olumlu yönde desteklendiği rapor edilmiştir. Oyunlar içerisinde kullanılan öğretim stratejileri incelendiğinde, bazı stratejiler üzerine yoğunlaşıldığı dikkat çekmiştir.

Anahtar Kelimeler: disleksi, dijital oyun, özel eğitim, alanyazın taraması

Introduction

Despite the fact that all individuals are "special", within our education system, we have "special" children who can not benefit from general education services and require different arrangements in their education processes. All education and training arrangements for these children are covered in special education. Special Education Law/573 (1997), "Children with Special Educational Needs" were defined as individuals who differed significantly from their peers in terms of their individual characteristics and educational qualifications for various reasons. In the same regulation, special



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education is given as personnel trained specifically to meet the educational needs of the individuals in need of special education, improved education programs and methods, and continuing education in an environment appropriate to their disability status and characteristics. Regulations in the learning process of students with special education needs vary according to their characteristics and degree (Batu and Kircaali-İftar, 2016:7). There are many classifications for individuals with special education needs. Special education categories can be treated as follows (Eripek, 1998; Special Education Services Regulation, 2006). Mental retardation, learning disability, affective and behavioral disorders, attention deficit and hyperactivity disorder, autism spectrum disorder, language, speech and communication disorders, hearing impairment, visual impairment, advanced and multiple deficits, physical disability, traumatic brain injury, ability...

The special education category covered in the present study is "dyslexia", a type of learning disability. Dyslexia is a neurological based (Hultquist, 2006) reading difficulty classified as a subcategory of specific learning difficulties handled under special education categories (Güzel-Özmen, 2015:341). The difficulties of learning in the Diagnosis and Statistical Manual of the Mental Disorders published by the American Psychiatric Association (2013) are divided into four groups as reading disorder (dyslexia), arithmetic disorder (Dyscalculia), dysgraphia and learning disorders not otherwise named. Individuals with difficulties in academic skills such as specific learning difficulty, reading, writing, information processing, spoken language, written language, or thinking skills are defined, and individuals with average or above average intelligence (Mastropieri and Scruggs, 2004 cited by Güzel-Özmen, 2015). Dyslexia is the level of intelligence and chronological age that is below the expected level of reading, writing and spelling (Spitzer and Williams, 1980). Although the nature of dyslexia is still debated, the currently widely accepted hypothesis is a language-based disorder resulting from a deficiency in the phonological processing system (Fischer, Lieberman and Shankweiler, 1978; Bradley and Bryant, 1983; Shaywitz and Shatwitz, 2004). Dyslexia is a condition that can not be treated with medication, and it receives support from education. Teaching technologies play an important role in supporting the learning processes of these individuals. For students with special needs, instructional technology can be defined as all kinds of tools and systems that enrich the communication process and enable the students to learn (Çoklar, Ergenekon and Odabaşı, 2018: 31). Digital games can play an important role in this context.

Turkish Language Institution (*TDK, Türk Dil Kurumu*) defines the game as "*Talent and intelligence developer, having certain rules and having good time*". Within the context of instructional technologies, games can be thought of as digital assisted or digital based materials used in learning teaching processes. So, can digital games respond to the needs of dyslexic individuals? In the light of this question, studies on digital games in the learning process of children with dyslexia were examined and attempts were made not to obtain data about the power of digital games to meet the educational needs of children with dyslexia.

Method

ScienceDirect and *Web of Science* databases,

- "dyslexia" + "game",
- "dyslexia" + "digital game",
- "special learning disorder" + "game"
- "special learning disorder" + "digital game"
- "special learning disability" + "game"
- "special learning disability" + "digital game"
- "special learning difficulty" + "game"
- "special learning difficulty" + "digital game"

articles were searched with keywords. This resulted in a total of 37 articles. After first analysis, a total of 19 articles were included in the literature review. Studies not related to the study and presented as a conference paper have not been included in the analysis.

Findings

- years?

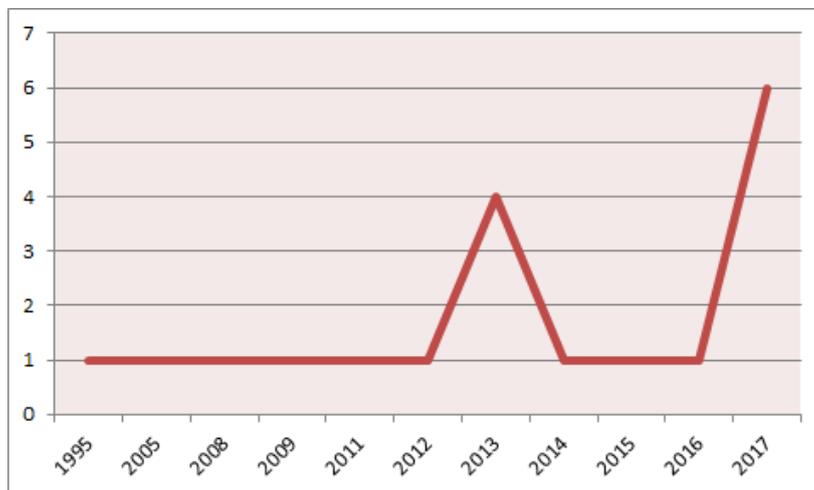


Figure 1. Studies distribution by years

-authors' department?

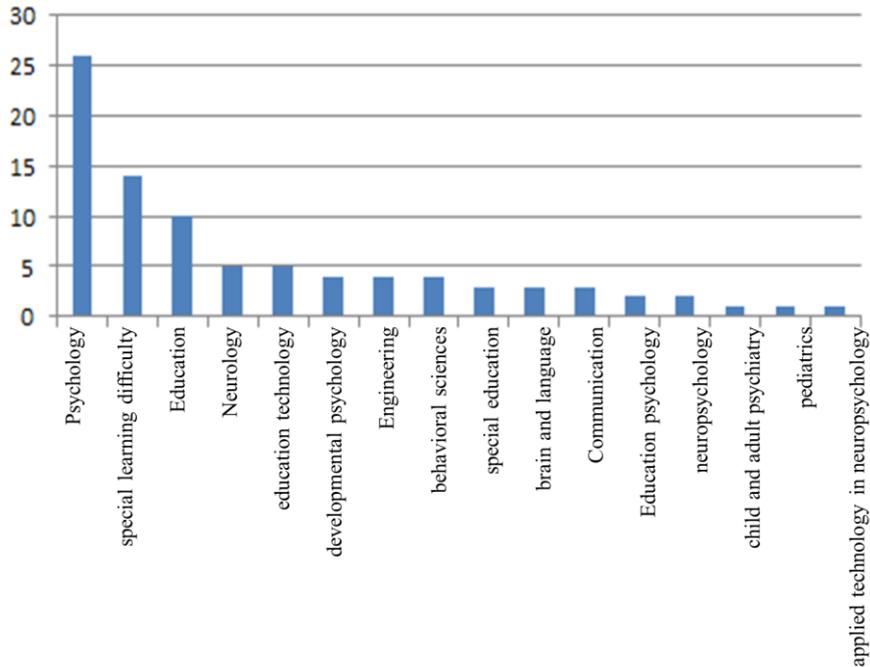


Figure 2. Authors' distribution by department

- games?

When we look at the games that are studied in the studies that are examined, it is seen that *GraphoGame* game is mostly used. In addition to this game, *Wordsmatter*, *Idiom King*, *Letter Prince*, *Ein Plein*, *Rescue Calcularis*, *Phonomena* and computer-based games not named in the study were observed to have effects on the learning process of children with dyslexia. The game goes on teaching longer and longer syllables. In this process, characters, sounds, colors, exercises in different logics are presented. The game is mobile and desktop compatible, teaching the combination of letters and sounds. Thanks to its algorithm, it adapts to the performance of the user. It can be thought of as an adaptable game. (Figures 3,4).



Figure 3. GraphoGame game two-letter syllable mapping screen image

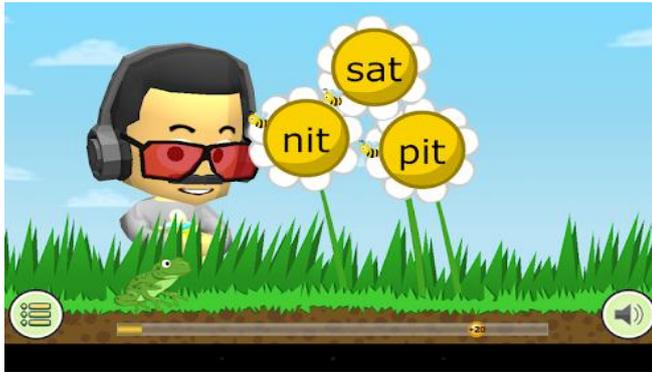


Figure 4. GraphoGame game three-letter syllable mapping screen image

-game strategies?

When the relation between dyslexia and digital game is taken into account, the main point is the ability to respond to the characteristics of the dyslexic individual of the digital game. When the strategies in the digital games discussed in the studies examined are examined, it is noticed that not all the features about the games are presented. In order for a material to be “a game”, it must include (1) rules, (2) goals and objectives, (3) feedbacks, (4) combat / race (5) interaction (with computer, with users), (6) presentation and storytelling (Prensky, 2001). When you look at the strategies in the games used in the studies examined here, a list can be presented as follows:

- Multi-format presentation of content (text, visual and audio support)
- Difficulty level
- Interaction with peers and experts (usually a large part of the games that have computer interaction)
- Character selection
- Different sections (different exercises)

-data collection tools?

The data collection tools used in the studies can be listed as follows:

- Attention: Posner's Task, Attentional Blink Task
- Reading behaviors: reading skills, word discrimination test, reading tests, one minutes test, Woodcock-Johnson Psycho-Educational Battery
- Reading motivation: SRQ-RM reading motivation test
- Learning / reading difficulty: Wechsler Intelligence Scale for Children, British Ability Scales
- Brain functions: ERP, FMRI
- Phonological awareness: Phonological Assesment Battery
- Other behavior: Log data, observation data

-dependent variables?

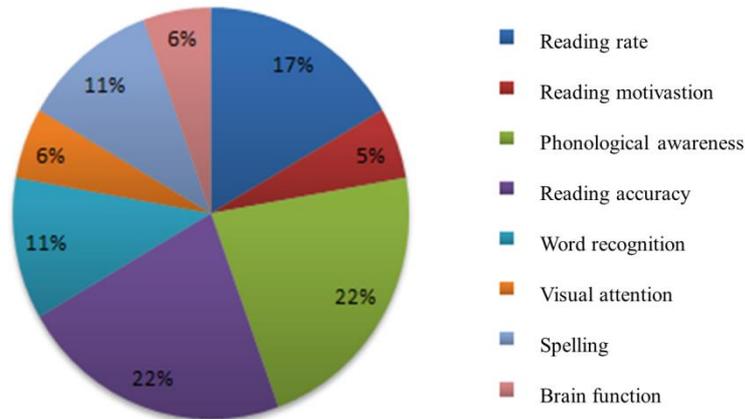


Figure 4. Distribution of dependent variables in the study

As a result of the analysis of "dyslexia and digital game" studies, it seems that their work has increased in recent years and that they are handled by different authors from different fields. *GraphoGame* game is mostly dealt with when studying the effects of different games in studies. It has been reported that different variables such as brain functions, visual attention and reading motivation have been observed in these studies while focusing on the effects of games on reading speed, correct reading and phonological awareness dependent variables. While studies are published in diverse magazines, it is noteworthy that there are differences such as special education, education, neurologist, language expert when the authors' study fields are examined.

Results, Discussion and Suggestions

Dyslexia is a feature that can not be removed but can be reduced in the teaching process through customized education processes. In general, instructional technology, especially digital games, is a critical question in this context. Can digital games respond to the needs of dyslexic individuals? In the light of this question, studies on digital games in the learning process of children with dyslexia were examined and attempts were made not to obtain data about the power of digital games to meet the educational needs of children with dyslexia. The studies have shown that the number of studies on dyslexic individuals is increasing. In studies, it has been reported that digital games are effective for dyslexic individuals, and the dependent variables examined are supported on the positive side. Both dyslexia and digital game occur in scope and complexity that can not be explained from the perspective of a single domain. Dyslexia; behavior, emotion, thought, social interaction, brain functions and so on should be taken from directions. Digital game is similarly too large to be considered in terms of learning performance



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alone. Individuals have to investigate emotional states, different skills, effects on brain functions, even influences on blood flow and hormones. For this reason, it is very important that the studies are carried out with interdisciplinary approaches. When the games examined in the study were examined, it was seen that the researchers developed the game. In addition, the effects of games developed by others (existing game) have been examined.

Strategies such as multi-form presentation (text, visual and sound support), difficulty level, interaction with peer and expert (usually computer interaction), character selection and different sections (mini games) are reported when looking at the strategies covered in the games. Whether digital game or a different teaching technology is used, it is important that the teaching strategy is appropriate for the user rather than the technological possibilities offered by the teaching technology. Teaching strategy depends on the ability of the addressed user to be well defined. It can be said that the studies carried out on this subject are very limited if it is thought that the student group which is emphasized in this study is dyslexic individuals and that we are far from defining them exactly. Studies, on the other hand, draw attention to the importance of interdisciplinary research in which different learning and game strategies are examined. Each study is important and valuable, even if it contributes to the learning of a single dyslexic individual, given the process and outcomes produced.

References

- Batu, S. & Kırcaali-İftar, G. Kaynaştırma (9. baskı). Ankara: Kök Yayıncılık.
- Bradley, L., ve Bryant, P. (1983). Categorizing sounds and learning to read: A causal connection.
- Büyükoztürk, Ş., Çakmak, E. K., Akgün, Ö. E., Karadeniz, Ş. ve Demirel, F. (2009). Bilimsel araştırma yöntemleri (5. baskı). Ankara: Pegem Yayıncılık.
- Çoklar, B., Ergenekon, Y. & Odabaşı, H.F. (2018). Özel Eğitim ve Eğitim Teknolojisi. Hatice Ferhan Odabaşı (Ed.), Özel Eğitimde Teknoloji içinde (s. 19-44). Ankara:PEGEM.
- Edition, F. (2013). Diagnostic and statistical manual of mental disorders. American Psychiatric Publishing, Arlington, VA.
- Eripek, S. (1998). Özel eğitim. Anadolu Üniversitesi.



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Fischer, F. W., Liberman, I. Y., ve Shankweiler, D. (1978). Reading reversals and developmental dyslexia: A further study. *Cortex* 14(4), 496–510. Nature.

Güzel-Özmen, R. (2015). Öğrenme Güçlüğü Olan Öğrenciler. İ.H.Diken, (Ed.), Özel Eğitim (12.Baskı) içinde (334-367). Ankara: Pegem.

Milli Eğitim Bakanlığı 573 sayılı Özel Eğitim Hakkında Kanun Hükmünde Kararname(1997).

Özel Eğitim Hizmetleri Yönetmeliği (2006). Erişim Adresi: <https://orgm.meb.gov.tr/>

Prensky, M.(2001). Digital game-based learning, McGraw-Hill, New York.

Shaywitz, S. E., & Shaywitz, B. A. (2004). Reading disability and the brain. *Educational leadership*, 61(6), 6-11.

Appendix 1.

Code	APA6 format
C1	Vasalou, A., Khaled, R., Holmes, W., & Gooch, D. (2017). Digital games-based learning for children with dyslexia: A social constructivist perspective on engagement and learning during group game-play. <i>Computers & Education</i> , 114, 175-192.
C2	Aravena, S., Snellings, P., Tijms, J., & van der Molen, M. W. (2013). A lab-controlled simulation of a letter–speech sound binding deficit in dyslexia. <i>Journal of experimental child psychology</i> , 115(4), 691-707.
C3	Lovio, R., Halttunen, A., Lyytinen, H., Näätänen, R., & Kujala, T. (2012). Reading skill and neural processing accuracy improvement after a 3-hour intervention in preschoolers with difficulties in reading-related skills. <i>Brain research</i> , 1448, 42-55.
C4	Yang, J., Peng, J., Zhang, D., Zheng, L., & Mo, L. (2017). Specific effects of working memory training on the reading skills of Chinese children with developmental dyslexia. <i>PloS one</i> , 12(11), e0186114.
C5	Antzaka, A., Lallier, M., Meyer, S., Diard, J., Carreiras, M., & Valdois, S. (2017). Enhancing reading performance through action video games: the role of visual attention span. <i>Scientific Reports</i> , 7(1), 14563.
C6	Ven, M., Leeuw, L., Weerdenburg, M., & Steenbeek-Planting, E. G. (2017). Early reading intervention by means of a multicomponent reading game. <i>Journal of Computer Assisted Learning</i> , 33(4), 320-333.



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C7	Rosas, R., Escobar, J. P., Ramírez, M. P., Meneses, A., & Guajardo, A. (2017). Impact of a computer-based intervention in Chilean children at risk of manifesting reading difficulties/Impacto de una intervención basada en ordenador en niños chilenos con riesgo de manifestar dificultades lectoras. <i>Infancia y Aprendizaje</i> , 40(1), 158-188.
C8	Jimenez, J. E., & Rojas, E. (2008). Effects of tradislexia videogame on phonological awareness and word recognition in dyslexic children. <i>Psicothema</i> , 20(3), 347-353.
C9	Kyle, F, Kujala, J, Richardson, U, Lyytinen, H, & Goswami, U. (2013). Assessing the Effectiveness of Two Theoretically Motivated Computer-Assisted Reading Interventions in the United Kingdom: GG Rime and GG Phoneme. <i>Reading Research Quarterly</i> , 48, 61-76, doi:10.1002/rrq.038.
C10	Pedroli, E., Padula, P., Guala, A., Meardi, M. T., Riva, G., & Albani, G. (2017). A Psychometric Tool for a Virtual Reality Rehabilitation Approach for Dyslexia. <i>Computational and mathematical methods in medicine</i> , 2017.
C11	Goffredo, M., Bernabucci, I., Lucarelli, C., Conforto, S., Schmid, M., Nera, M. M., ... & Grasselli, B. (2016). Evaluation of a motion-based platform for practicing phonological awareness of preschool children. <i>Journal of Educational Computing Research</i> , 54(5), 595-618.
C12	Ludovico, L. A., Di Tore, P. A., Mangione, G. R., Di Tore, S., & Corona, F. (2015). Measuring the Reading Abilities of Dyslexic Children through a Visual Game. <i>iJET</i> , 10(7), 47-54.
C13	Pennala, R., Richardson, U., Ylinen, S., Lyytinen, H., & Martin, M. (2014). Computer game as a tool for training the identification of phonemic length. <i>Logopedics Phoniatics Vocology</i> , 39(4), 149-158.
C14	Bach, S., Richardson, U., Brandeis, D., Martin, E., & Brem, S. (2013). Print-specific multimodal brain activation in kindergarten improves prediction of reading skills in second grade. <i>Neuroimage</i> , 82, 605-615.
C15	Kucian, K., Grond, U., Rotzer, S., Henzi, B., Schönmann, C., Plangger, F., ... & von Aster, M. (2011). Mental number line training in children with developmental dyscalculia. <i>NeuroImage</i> , 57(3), 782-795.
C16	Ecalte, J., Magnan, A., Bouchafa, H., & Gombert, J. E. (2009). Computer-based training with ortho-phonological units in dyslexic children: new investigations. <i>Dyslexia</i> , 15(3), 218-238.
C17	Eden, G. F., Stein, J. F., Wood, H. M., & Wood, F. B. (1995). Temporal and spatial processing in reading disabled and normal children. <i>Cortex</i> , 31(3),



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	451-468.
C18	Franceschini, S., Gori, S., Ruffino, M., Viola, S., Molteni, M., & Facchetti, A. (2013). Action video games make dyslexic children read better. <i>Current Biology</i> , 23(6), 462-466.
C19	Moore, D. R., Rosenberg, J. F., & Coleman, J. S. (2005). Discrimination training of phonemic contrasts enhances phonological processing in mainstream school children. <i>Brain and language</i> , 94(1), 72-85.



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Design and Application of Food Chain Game with Scratch Programming

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Abstract

Recently, artificial intelligent (AI) and coding lesson has been getting importance all over the world. A lot of technology companies invest foundation on AI and coding. Many applications, software, coding and AI should accompany to modern education. Ministry of National Education (MEB) added the coding lesson in Social Studies and Science High School's curriculum. Also MEB and YEGİTEK (Directorate General of Innovation and Educational Technology) support all the school with technological devices like interactive boards, tablets and also educational software EBA (National Education Contents Platform) MEB is also trying to give importance to STEM. In this kind of education a lot of different branches are used together and precede the usage of the technology in education. On the other hand according to PISA, what has been taught in the schools was useless in Turkey because in the schools just information has been tried to convey to students but it is very easy to find and get the information with technology. With the help of FATİH project technological devices are started to be used in classrooms, however suitable software for the interactive boards aren't be available now. For example it is observed that material used at smart boards aren't interactive, just pdf. formats are presented to students that is not away the old classical methods. Along the coding lessons in the schools also there are many extra courses on the coding in many schools. The education would be more effective, permanent and entertaining if the teaching can be carried out for different kinds of intelligent and emotions. Educational games have been shown to contribute to learning positively because they support multimedia and have many stimulating objects. Also, thanks to the games, the students are able to learn by amusing and to keep their attention for a longer time. The world has many kinds of energy in itself. Energy always changes such as light was captured in chemical in the plants and this accumulation was transformed into vitality energy (ATP) or this vitality energy may be transformed into psychical energy. In this project, one of the objectives of science lesson; food chain is aimed to be combined with coding lesson. On M-Block platform, food chain one of the subtopic of living creatures and vitality energy unit is set as a game by a programing language “Scratch”. As for coding lesson, the objectives of in 6th grade ICT (Information and communication technologies) lesson are being taught. This project is a levelled game. The objective of the game is to teach what the living creatures consume or not. The player of the game learns the circles of the food chain at the end. When the player chooses the right



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nutrients for the living creatures, he gets a point. But if the player chooses the wrong nutrient, he loses a point. The source of energy the sun is always on stages with the player. When the level completed, each nutrients has a grave itself. All the living things belongs to that grave work out like decomposing mushrooms and everything is recycled to the nature. In the game, the energy resources of the living things and the adventure of the energy cycle are taught. The game consists of five levels. Each level is moving through the types of energy that the creatures can or cannot use. The transitions between the levels, the objectives are reinforced with multiple choice, short answer, and matching questions about the food chain and its components. This study contains a concrete example of the use of educational games. It is envisaged that many abstract and difficult subjects will be transferred through game, facilitating narration and learning. The objectives involved in the unit in this study have been transferred through the game. The students in the study are divided into two groups as experiment and control group. The subject was taught through the educational game designed for the students in the experiment group. In the control group, the subject was taught through presentation using traditional methods. The information of the students in both groups related to the food chain before and after the study was measured by pre- and post-tests. It was observed that the learning level of the students in the experiment group participating in the course with the food chain game was statistically significant. As a result, it was observed the students had more fun and learned more efficiently by means of the game. The study can be made more comprehensive by the development of applications for the different courses or different units in the same course.

Key words: Scratch Programming, Game Design, Digital Learning with Games.

Introduction

The needs of using instructional technologies in different fields has increased in line with the technological developments in recent years. In the coming years, artificial intelligence is thought to be close to the human brain. Instructional technology has also become an important actor in different types of education. For example; dijital games and robots that learn sign language for people with disabilities [4]. The use of games with robots in disability education in maths, foreign language and soscial activities teaching could be the examples of these [6].

Of course, there are many reasons why such studies are used more often. However, many systems that produce practical solutions in many areas that are difficult for human being to reach are preferred because of educational support in many parameters in terms of material possibilities, time, speed, permanent learning. Information technology has the chance to address more than one intelligence type simultaneously. When we look at the human learning process, it is known that, with many variables, applications that address multiple intelligence types are more successful. Games that keep many areas of the brain alert are an important tool in this regard. The objectives to be given to children can easily be given through play. However, it is expected that the children who start the school will take a break from the games. The time spent in the child's play is



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often thought of as a time stolen from the lesson's time. Right here, it is accurate to come together the interest of the learner with the educational aspect of the game. In many studies, it is emphasized that people of all ages can learn through play and the game is one of the unchanging phenomena of human nature. It is mentioned by the students that the game [9], which is a reference source for all stakeholders who work in the field of education, increases their interest in the lessons [1].

According to another study about the game, it was emphasized that "studies on game-based learning in the field of literature have shown that game enables students to having fun, high motivation latent learning and active role while learning". It saves the game learning environment from scratch. However, the learning environment should be based on the needs of the learners [2].

It is stated that educational games have contributed positively to learning because they support multimedia and have many stimulating objects. In addition, through the games, students are able to learn by having fun and keep their attention for a longer time. When examining the items to be considered in the use of games in education, it is necessary to evaluate many parameters. To help students comprehend the objectives that are designed according to different sources, to be able to comprehend the levels of the students, to use the correct and effective use of Turkish language, to ask questions that improve critical thinking skills, to narrate, to leave students in control, to give feedback, to add users, the ability to adjust the level of difficulty of the game, the use of preliminary information and the permanence of the information, the simplicity of the game and the gameplay, the online play, the quick operation of the games, the recording of past performances, the aesthetics, the ease of use and stopping and continuing the game. On the other hand, game design is an important opportunity for designers. The ability to combine programming logic and ready-to-play add-ons of game engines that users will have in designing and developing games will make game designers more advantageous at that level. Despite such technical and hardware differences of game engines, the parameter that collects these software in the most important point is undoubtedly the imagination and synthesis power of game developers. Increasing the number of users who use their imagination, who have technical and hardware background, which takes into consideration the characteristics of game engines and who can select and use the appropriate game engine, will increase the quality of education games and the number of usage in education [3]. Eğitsel oyunların tasarlanmasında kullanılan oyun motorlarının değerlendirilmesi.

Nowadays, game-based learning or game learning has become used in all branches. Dozens of games designed in the field such as Math, music, chemistry, biology, language and geography. In the games designed for education, if the students see what they need, it will support permanent learning by designing a game for the need.

Instructional Technologies in Turkey



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The number of use cases of information technology in education has increased so much that the stakeholders of education have to adapt to the process in some way. For example, the Ministry of National Education (MEB) has passed through many projects, works and practices in this area. Starting with the fast internet and having smart board, the MEB applied dozens of projects like giving the tablets to the teachers and students, the software that provides the coordination of these tablets, the Education Information Network (EBA) platform, mebbis, e-curriculum and having access to all programs and books through the smart Board that are allowed by Ministry of Education. The Ministry of Education has gradually added coding from primary education to high school. The Ministry of National Education (<http://www.eba.gov.tr/kod>) provided a demonstration of the public domain called "Learning to Encode Children" to encourage encode sharing space and encoding. Here it is correct to talk briefly about STEM, which MONE is striving to draw into education in a certain way. STEM has become an important player in education in recent times, focusing on education as a whole and a combination of many branches. Today, it is important to use and interpret knowledge as much as to acquire knowledge. Recently, it is seen that important studies carried out by MEB on STEM education appear to take place. Apart from the state institutions in education, it is possible to talk about private sector based information based practice. Many applications such as Vitamin and Morpa, which are created by using the possibilities of private sector information, try to reach the students throughout the most recent technological devices. When we look at the Turkish education system from the perspective of international figures, it is not possible to say that the figures are very open. According to the PISA survey results of 2015, between 540 thousand students aged 15 and 72 in our country, were below the OECD average in science and mathematics, reading skills and our country was ranked 50th. Turkish students' participation to the expression "often having fun when they are learning science" is less than the OECD average, but science motivation is above the report [5]. In short, according to the PISA, students generally have a positive attitude towards the science, but the achievements are low [8]. The purpose of this study is acquiring the scientific objectives stated by the international figures by combining the development of the computer technology with the necessity of the game and varieties in intelligence types.

In this study, it is aimed to design an educational game application in order to provide learners with the opportunity to have fun while learning the topic of food chain, which is one of the objectives of Science. The work was based on the objectives of the Science Teaching Curriculum published in 2018 by the Ministry of National Education's Board of Education. Unit 6 'Energy Conversions and Environmental Science' is aimed at transferring the objectives of Food Chain and Energy Flow by the help of a game. At the end of the game, the students were aimed at the concept of food chain, food web, producer, consumer, parser, ecology pyramid, biological accumulation.



Method and Application Design

M-Block platform has been used in the research. Strach is a free visual programming. Scratch is a free visual programming language developed to help simplify the process of creating and programming animations, games, music, interactive stories and more. The Scratch programming language is primarily targeted at children ages eight and older, and it is designed to teach computational thinking using a simple but powerful building-block approach to software development that focuses more on problem solving than on specific syntax. Originally developed by the lifelong kindergarten group at the MIT media Lab, Strach is currently available in more than 50 different languages and can run on Windows, Macintosh and Linux operating systems [7]. In the game, it is aimed to give the objective and awareness of what the creatures that have entered the food chain can consume. The person who plays the game learns the rings of the food chain at the end of the game. The nutrition that the creature can consume provides the player plus points. Foods that can not be consumed by the creature are written as minus points to the player. The sun, the source of energy, accompanies the player throughout the entire game. The game consists of five scenes. Each scene is moving through the types of energy that the creatures can or can not use. In the transitions between the scenes, the achievements are reinforced with multiple choice, short answer, and matching questions about the food chain and its components. In the sample; 60 students were selected randomly.

The objectives involved in the project have been transferred through game. The students in the study are divided into two groups as experiment and control group. The lectures were given with the educational game designed for the students in the experiment group. In the control group, lectures are given by way of presentation using traditional methods. The information levels of the students in both groups related to the food chain before and after the study was measured by pre- and post-tests. It was observed that the level of learning of the students in the experiment group participating in the course with the food chain game was statistically significant in the positive direction. The tests consist of two 20-question multiple-choice test. MEB acquisition tests were used as the tests. A grasshopper eating grass on stage 1, a frog eating grasshopper on stage 2, a snake eating a frog on stage 3, and an eagle eating a snake on stage 4 were used.



view from the 1st part

view from the 2st part



view from the 3st part

view from the 4st part

The study contains a concrete example of the use of educational games. It is envisaged that many abstract and difficult subjects will be transferred through play and it helps facilitating lecturing and learning. As a result, it was observed that the game was designed, enable the students enjoy learning and achieving more efficient learning. The study can be made more comprehensive by the development of applications for the different courses or courses in the same course.



Results and Suggestions

The success rate of the game was 23 percent advantage compared to the first group using the classic method. It has provided a better learning. It is also possible to say that learning is carried out by willing and amusing, aside from the students talking to each other, to distract their attention and to be bored. It has also been observed that the course is also successful in active participation. When asked if they would like to participate again in this way, all of the students answered "yes".

In this study, the subject of nutrient chain and objectives are put into play. For better results, updating the game in different lessons and acquisitions or increasing the difficulty level of the game could be thought.

References

- [1] Akın, F. A., & Atıcı, B. (2015). Oyun Tabanlı Öğrenme Ortamlarının Öğrenci Başarısına Ve Görüşlerine Etkisi. *Turkish Journal of Educational Studies*, 2(2).
- [2] Bayırtepe, E., & Tüzün, H. (2007). Oyun-tabanlı öğrenme ortamlarının öğrencilerin bilgisayar dersindeki başarıları ve öz-yeterlik algıları üzerine etkileri. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 33(33), 41-54.
- [3] Çoban, M., Yıldırım, Ö., & Gökteş, Y. (2011, September). Eğitsel oyunların tasarlanmasında kullanılan oyun motorlarının değerlendirilmesi. In *5th International Computer & Instructional Technologies Symposium* (pp. 22-24).
- [4] Kose, H., & Yorgancı, R. (2011, October). Tale of a robot: humanoid robot assisted sign language tutoring. In *Humanoid Robots (Humanoids), 2011 11th IEEE-RAS International Conference on* (pp. 105-111). IEEE.
- [5] OECD. (2016). Organisation for Economic Co-operation and Development (OECD). (2016). PISA 2015 results in focus.
- [6] Özdemir, D., & Karaman, S. (2017). Investigating interactions between students with mild mental retardation and humanoid robot in terms of feedback types. *Eğitim ve Bilim*, 42(191).
- [7] Scratch (2018). www.scratch.mit.edu/about. 01.03.2018 tarihinde erişim sağlanmıştır.
- [8] Taş, U. E., Arıcı, Ö., Ozarkan, H. B., & Özgürlük, B. (2016). PISA 2015 ulusal raporu. *Ankara: MEB*.
- [9] Yıldırım, İ., & Demir, S. (2014). Gamification and education Oyunlaştırma ve eğitim. *Journal of Human Sciences*, 11(1), 655-670.



Nature Discovery with Virtual Reality

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Abstract

Industrial and commercial developments have led people to urban life from rural areas. Especially in developed and big cities, people live a life away from nature. Green areas are transformed into urban areas in order to meet the increasing population needs of housing. This transformation alienates urban people and especially children against nature. Children can only know the potted flowers grown at home and the plants in the park nearest the area where they live, many plants can only be seen in the pictures. For these children who do not know whether their favorite fruit grows in a tree or a seedling, the related activities in their schools are not enough. Increasing agricultural activities in the greenhouses in our country and importing of various foods cause the children to be confused about knowing which fruits and vegetables they are growing in which season. Technology can be used to help solve these issues.

In order to make life easier, advanced technology devices are developed and offered to our service. These devices, which are integrated with software technologies, are now called "smart". Virtual reality glasses from these devices are integrated with other devices such as smart phones and have software support. Applications developed for smartphones that can now be found in every home can be used for both entertainment and education. Especially, it is possible through virtual reality applications that the training activities which can not be done due to the high cost, the preparation of the necessary environmental conditions and the difficulties like security. The combination of entertainment and education is important for attracting children. Virtual reality technology can also be used to help children who are growing up in city life to better understand nature.

The virtual reality application in this study has offered the opportunity to make virtual nature trips that allow people to meet plants in different species such as trees, mushrooms and flowers. Informations such as the types, leaf forms and fruits of trees seen during the trip are given visually. Informations such as fruit-giving periods and regions commonly seen in our country are given as audibly. With this application, it is possible to learn the names of flowers as well as health-related information such as how to distinguish edible and poisonous plants such as mushrooms. It will be very helpful to know this information especially on real trips with children.

In order to increase the interest of the children to application and to keep their motivation at a high level, tasks have been placed where they can play games while performing. Children can travel in a virtual forest we model for this purpose. They try to do a mission at the same time during the trip. When the trip is completed, they may



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encounter puzzles that they can solve using the information they have learned. This makes it possible to make information more permanent.

Children will learn the names and species of these plants in the easiest and fun way, by modeling the nature in the virtual environment, in the scout clubs, nature trip clubs, schools and even at home. The information obtained in a fun way will increase children's interest in nature. As a result, children can realize that life is not just about the city, because they are interested in activities such as scouting, camping activities, nature observation teams, etc. which can be intertwined with nature. In further studies, we can further improve the virtual forest environment and enrich it with different applications so that children with disabilities who are unable to leave the home environment can do nature explorations.

Keywords: Virtual Reality, digital game, game software development, nature discovery

Introduction

Virtual reality technology was originally developed in the United States in 1960 to be used in the training of pilots (Ying, Jiong, Wei, Jingchun, & Xiaopeng, 2017). Having an important role in reducing the danger during training is the main reason for its development (Ying et al., 2017). The VR device was quite expensive until recently. As a result of today's technological developments and lowering of production costs, the use and usage areas of VR technology are getting widespread. Applications such as engineering education (Stuchlíková, Kósa, Benko, & Juhász, 2017), robot education (Santos, Sangalli, & Pinho, 2017), safety education in fire (Zhang, Suo, Chen, Liu, & Gao, 2017), music education (Serafin, Adjorlu, Nilsson, Thomsen, & Nordahl, 2017), nurse education (Elliman, Loizou, & Loizides, 2016) are some of the different uses. As a result of the emergence of high-tech products and the integration of these products with software technologies, we met with the concept of smart devices. Many applications for both educational and entertainment purposes are carried out with virtual reality glasses, one of the smart devices. Virtual reality offers the opportunity to bring entertainment and education together to attract children's attention and facilitate their learning. In virtual learning environments developed with VR, students have the opportunity to work in an immersive and entertaining way. In this study, a virtual reality application was developed to provide children who are far away from nature within city life to recognize nature closely.

Today, the number of children growing in urban life is increasing day by day. As a result, children grow up without come across plants, such as trees and flowers in different species in the natural environment. A virtual reality environment that allows children to learn plant species in an entertaining way has created in the study.

In this study, a virtual environment was created by modeling the natural environment in order to make a nature trip. In the created environment, a structure was developed to provide children with both visual and auditory learning. Children can learn the kinds of trees, the fruits they give, leaf structures, and how often they are seen in our country. At



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the same time, information is provided to enable children to identify plants that are poisonous, such as mushrooms. Various games were created in the application in order to increase the attention of the children and to keep their attention at a high level. Thanks to these games, a more efficient learning environment has been created.

Related Works

Today, children's lack of adequate physical activity has become an epidemic. This epidemic is causing health problems and obesity that can affect them in all their lives. It can focus on the development of motor skills to improve children's physical activities. However, challenging processes such as neuromuscular training (NMT) can be limited at an early age depending on the level of the child's cognitive and perceptual motor development. Giving these trainings at an early age will help improve children's physical activity in their old age. Adam W. Kiefer et al. (Kiefer, Pincus, Richardson, & Myer, 2017) designed a virtual world using virtual reality to prevent this problem and improve children's visual and auditory motor skills at an early age. In this environment, the complexity of education can be increased or decreased according to the level of children. Training in the VR environment in this way pioneers children's neuromuscular training (NMT) in the real world.

Han, JH (Han, Jianhai) et al. (Han, Lian, Guo, Li, & You, 2017) has designed an active rehabilitation education system that can be used for upper extremity hemiparesis by using virtual reality technology. The six-axis inertia measurement sensors are used to measure the range of motion of both the shoulder and elbow joints. Various virtual rehabilitation training games have been designed using Unity 3D to enhance the effectiveness of rehabilitation training. These games have various tasks ranging from simple level to difficult level. The aim is to keep the interest of the patient at the top level during rehabilitation. The main function of these game scenes in virtual rehabilitation is to test and verify the condition of the patient with single joint training and multi-joint training experiments. Experiments show that the range of motion of both shoulders and elbows can reach a normal person's distance in rehabilitation training games. Since the system needs simple requirements such as ease of wear, low cost, and wireless communication, it can offer an effective rehabilitation training process for patients with upper limb hemiparesis even in the home environment.

Villiger, M (Villiger, Michael) (Villiger et al., 2017) has designed a system that allows exercises such as training diversity, intensive motion repetition and motivation training tasks to affect the rehabilitation and functional recovery of the patient positively in the post-SCI period in a virtual environment. With this system, the patient has the opportunity to be treated in his own home without having to go to any special hospital environment. In this study, it is checked whether the use of motor functions such as muscle strength and balance of the lower limb of the patient is appropriate. In this study, a home based mobile lower limb VR training system was tested on 12 chronic spinal cord injured persons. The system was formed by combining motivation training scenarios and action, observation, practice trio. The representatives of the legs and feet



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in the virtual world are moved by motion sensors. The patients used the home based education system for 4 weeks with 35-40 minute periods as a total of 16-20 parts. After using the system for 4 weeks, it was observed that the patients had high motivation and positive changes. As a result, it is observed that the virtual reality education system which is used as an unsupervised home base is a useful functional education effect on patients with chronic spinal cord injury. Villiger, M (Villiger, Michael) (Villiger et al., 2017) suggest that this system can be used as a neurorehabilitation tool.

Developed Application

The nature discovery game has been developed using the C# programming language in the Unity 3D game engine platform. In the study, the Samsung S6 mobile phone that is compatible with Gear VR goggles is used.

During the development of the game, firstly, the in-game character has been created. Oculus, a manufacturer of Gear VR, offered the use of a character pack for Unity 3d that is suitable for the first-person perspective. This character pack has been adapted to the game mechanics and the corresponding code files have been added.

The playground has been created with environment items designed in three dimensions. In the next step, the user interface and in-game menus are produced in graphic design programs and added to the game. Afterwards, interface elements and game mechanics are linked through coding. In the game, every plant that the user needs to find is modeled and adapted to the game. By adding a code file to the plant model, specific numbers and information for each plant have been added to the plant's code file. Thus, when the user finds a plant in the game, information about that plant is extracted from the plant's own code file. A different data center could also be used to retrieve this information, but when this game has been developed it seemed appropriate that the objects that are independent of each other had to be a whole on their own. Plant objects made ready for the game are placed at various points in the playground.

As can be seen in the flowchart of the game shown in figure 1, when the user finds the plant, information about the plant is given and the plant to be found is shown. If all the plants are found, the game is complete. When the user wants to play the game again, the character position in the game is placed at a random position and the game is started from that position. In this way, the risk of memorizing the flowers in the game is reduced and the game is diversified. Adding variety to the game means adding continuity because it is not possible for the user to repeat the same game every time.

The game has been compiled with the extension ".apk" so that it can be played on Android operating system after the necessary settings and optimization processes are done. The game is a prototype with this version and is clearly designed to be developed. The number and variety of independent in-game objects it contains can be easily increased. In this way, the scope of the game and the target mass can be expanded.

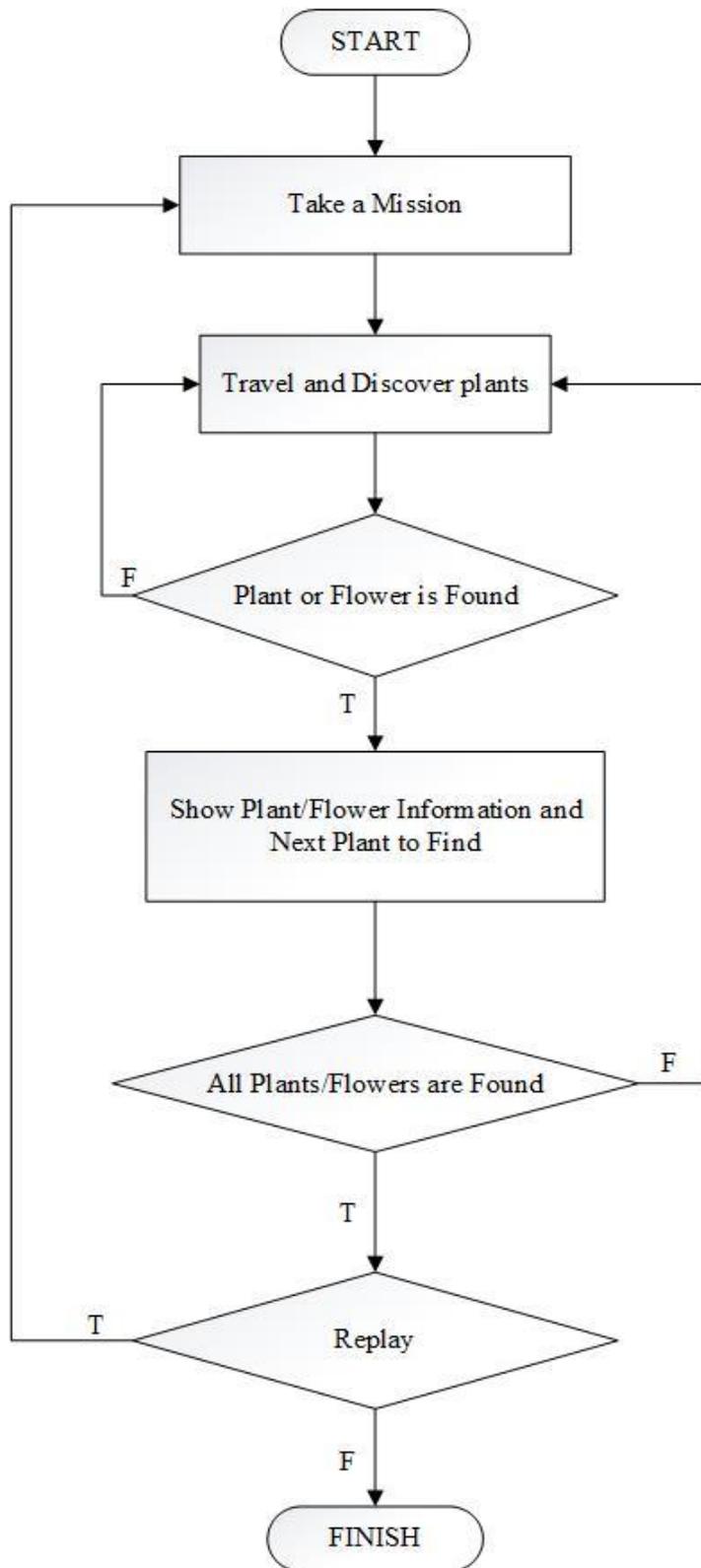


Figure 1. Flowchart of the nature discovery game.



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Conclusion

In recent years, the cost of hardware for virtual reality technology has been cheaper. Thus, a significant increase in virtual reality applications has been realized. With this increase, in many different areas, applications have been started to be developed by using the virtual reality technology. Especially in many different branches of the education field, with the help of the virtual reality technology an interactive and entertaining learning environment has been realized. It is known that virtual reality applications have positive effects such as offering opportunities to experience an inaccessible real-world experience, increasing motivation, motivating imagination, advancing the student at his own pace in an interactive environment, addressing multiple sensory organs, learning by living by doing, and improving academic achievement (Aktaman & ARICI, 2013, ÇAVAS, ÇAVAS, & CAN, 2004, KAYABAŞI, 2002). As the country life spreads more and more every day, children are growing away from the natural environment. That is not easy for children to reach the natural environment within the country life. For this reason, a virtual reality application has been developed that will enable children to learn plants, trees and flowers in the nature.

In this study; virtual reality technology for the students who are interested in the new technologies in the digital age and who can easily accept them has created an amusing learning environment and provided them with the opportunity to know more about the plants in the nature and have knowledge.

By creating a virtual nature walk environment within the application, an environment has been created to help children to recognize the nature. By modeling the nature walk as a game, we tried to make learning more fun. Thus, children will be informed about the plants and flowers that they have found while performing the tasks of finding the flowers and plants that are assigned to them during the nature discovery. At this point, children learn by discovering the nature in an interactive and entertaining environment. In addition to this, a safe, time and weather condition independent environment for children is provided.

Enrichment of the content of the pilot implementation in line with the opinions of field experts and then to conduct empirical studies to investigate the effects of persistence, particularly with student participation.

References

Elliman, J., Loizou, M., & Loizides, F. (2016, 7-9 Sept. 2016). Virtual Reality Simulation Training for Student Nurse Education. Paper presented at the 2016 8th International Conference on Games and Virtual Worlds for Serious Applications (VS-GAMES).

Han, J. H., Lian, S. J., Guo, B. J., Li, X. P., & You, A. M. (2017). Active rehabilitation training system for upper limb based on virtual reality. *Advances in Mechanical Engineering*, 9(12), 12. doi:10.1177/1687814017743388



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Kiefer, A. W., Pincus, D., Richardson, M. J., & Myer, G. D. (2017). Virtual Reality As a Training Tool to Treat Physical Inactivity in Children. *Frontiers in Public Health*, 5, 7. doi:10.3389/fpubh.2017.00349

Santos, M. C. C. d., Sangalli, V. A., & Pinho, M. S. (2017, 4-8 July 2017). Evaluating the Use of Virtual Reality on Professional Robotics Education. Paper presented at the 2017 IEEE 41st Annual Computer Software and Applications Conference (COMPSAC).

Serafin, S., Adjorlu, A., Nilsson, N., Thomsen, L., & Nordahl, R. (2017, 19-19 March 2017). Considerations on the use of virtual and augmented reality technologies in music education. Paper presented at the 2017 IEEE Virtual Reality Workshop on K-12 Embodied Learning through Virtual & Augmented Reality (KELVAR).

Stuchlíková, L., Kósa, A., Benko, P., & Juhász, P. (2017, 26-27 Oct. 2017). Virtual reality vs. reality in engineering education. Paper presented at the 2017 15th International Conference on Emerging eLearning Technologies and Applications (ICETA).

Villiger, M., Liviero, J., Awai, L., Stoop, R., Pyk, P., Clijsen, R., . . . Bolliger, M. (2017). Home-Based Virtual Reality-Augmented Training Improves Lower Limb Muscle Strength, Balance, and Functional Mobility following Chronic Incomplete Spinal Cord Injury. *Frontiers in Neurology*, 8, 8. doi:10.3389/fneur.2017.00635

Ying, L., Jiong, Z., Wei, S., Jingchun, W., & Xiaopeng, G. (2017, 18-21 Oct. 2017). VREX: Virtual reality education expansion could help to improve the class experience (VREX platform and community for VR based education). Paper presented at the 2017 IEEE Frontiers in Education Conference (FIE).

Zhang, K., Suo, J., Chen, J., Liu, X., & Gao, L. (2017, 3-6 Sept. 2017). Design and implementation of fire safety education system on campus based on virtual reality technology. Paper presented at the 2017 Federated Conference on Computer Science and Information Systems (FedCSIS).



Educational Digital Gaming Design For Children On Siber Security And Social Media Ethics

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Abstract

The game is called activities that individuals do to have fun and have a good time. Computer games have become widespread especially in educational activities after the 90's. Computer games are very important for social and mental development. According to the researches conducted, it was observed that primary, secondary and high school students spend a lot of time during the day playing games on digital platforms. The concept of the game to the kids before the 2000s, the establishment of social relationships, competitive and based on the relationship established in the virtual world to the real relayed around the world a fun time passing vehicle while today's children, it was determined that perceived spend a fun time. The rapid development of digital games and the increase in the number of games developed are investigating the effects of games on human behavior and social relationships. As a result of the collaborations of trainers and software developers, a lot of tutorial software applications are being designed. When the relevant games are examined, it is seen that gaming softwares have been developed especially to increase the cognitive levels of kindergarten and primary school children. However, it has been found that the victimization of children in the virtual world is caused by the inadequacy of cognitive information on the basis of information security and social media ethics. For this reason, a game design has been developed in order to create information security and social media awareness in the work. The aim of the game is to teach children how to protect themselves from the dangers of the virtual world. With the developed game, primary, middle and high school level individuals will have the opportunity to learn about cyber security and social media ethics as well as having fun while playing the developed game. Three levels were developed to improve cognitive levels in cyber security and social media ethics in game design. Each level will be attempted to achieve a concrete recovery from the various issues in this area (malicious software such as Trojan, Worm, Spam, Malware, Virus, malicious behavior types, social engineering attacks, cyberbullying etc.). Based on the role-playing game (RPG) method, the named avatar named "GüvenCan" was created and the responses and responses given to the questions about the concepts of cyber security, information security and social media ethics were realized and the learning process was realized. The feedback given in the vote is positive reinforcement, ensuring that the learner is permanent. The characters and graphic objects used in the design of the game are prepared in 2D in Photoshop program. Design is realized by providing the



integration of Unity and MonoDevelop in the Visual Studio platform and the code created in C # programming language. Designed with Unity, the game will not only be available on the computer but also on mobile platforms (mobile phones, tablets, etc.). On desktop platforms only the keyboard can be played through the touch screen on mobile platforms. In order to prevent children from distracting during play, the game progression stages are short and using moving objects that require focus. Topics covered in the game content are designed taking into consideration the main topics included in the source named "Awareness Raising" on the official website of Information Technologies and Communication Agency. It is envisaged that users will be aware of cyber security, information security and social media ethics with this game. Especially, it is considered that the game designed at the point of efficient and effective use of the tablets distributed in the FATİH project in our country will contribute. The designed game will contribute to the issues of harmful software, ethical values, digital citizenship, confidentiality and security issues and technologies to be used in the scope of the 5th and 6th class "Information Technologies and Software Course" given in the secondary education institutions affiliated to the Ministry of National Education . It is also envisaged that Vocational and Technical Anatolian High Schools will contribute to the understanding of the topics of harmful software covered in "The Basics of Information Technologies" given to 10th grade students.

Keywords: Cyber Security Awareness, Social Media Ethics, Digital Game Design

I. Introduction

Social Media Ethics: Social Media Web sites frequently used by middle and high school students. Today's children and adolescents use at least one of the social media addresses. According to research done in the United States as of August 2017 0-17 Teenagers use Snapchat on Using Social Media to 45.1 million, 18.7 million use Instagram, Facebook usage is 4.5 million [13].

Turkey is not a study about the use of social media According to the official age.. But according to the "Digital in 2017 Global Overview" report on social media usage, The number of active social media users is 48 million [14].

The figures show how much social media is being used. Frequent use of social media between the ages of 0-17 has caused some security, privacy and ethical problems. It has become more and more important for individuals in this age group to use social media effectively and correctly. Because Cybercriminals use social media to see individuals in



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this age range as victims. Families, Government and Researchers are looking for solutions to this issue and questioning the importance of social media privacy and ethics in this age group. In this project, individuals aged 0-17 will learn social media ethics by amusing.

Malware and Spyware : Cybercriminals use Malware software to harm computers or systems for many reasons. These software are directly harmful to the computers, indirectly to the people, the enterprises and the governments. People are suffering materially and spiritually from these cyber attacks.

Spyware is also software that copies the information of individuals or businesses without their permission.

It is important for students to learn how to identify and protect these malicious software in Cyber Security training. If a student recognizes malware and takes precautions, material and moral damage can be minimized during potential attacks

For this purpose, a level of game has been developed for the students to learn the amusing types of malware and spyware.

Cyberbullying: Cyberbullying or cyberharassment is a form of bullying or harassment using electronic means. Cyberbullying and Cyberharassment are also known as online bullying. It has become increasingly common, especially among teenagers [15].

In the Youth Risk Behavior Survey 2013, the Center for Surveillance, Epidemiology, and Laboratory Services of the Centers for Disease Control and Prevention published results of its survey as part of the Youth Risk Behavior Surveillance System (YRBSS) in June 2014, indicating the percentage of school children being bullied through e-mail, chat rooms, instant messaging, websites, or texting ("electronically bullied") during the course of 2013 [16].

The above table based on grade and gender of young individual of school age in 2013 show the rate of exposure to cyberbullying. (Table 1)

Table 1: Based on grade and gender of young individual of school age in 2013 show the rate of exposure to cyberbullying. .^[16]



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Grade	Female	95% confidence interval	Male	95% confidence interval	Total	95% confidence interval
9	22.8%	19.5%–26.6%	9.4%	7.9%–11.1%	16.1%	14.1%–18.2%
10	21.9%	18.7%–25.5%	7.2%	5.4%–9.6%	14.5%	12.6%–16.6%
11	20.6%	17.4%–24.3%	8.9%	7.3%–10.7%	14.9%	13.0%–16.9%
12	18.3%	16.3%–20.5%	8.6%	7.0%–10.5%	13.5%	12.2%–14.9%

II. Game-Based Learning (Gbl)

A subset of educational Serious Games, game-based learning (GBL) uses competitive exercises to motivate students learning according to specific learning objectives [6]. The students can compete either with other students or against themselves. The games used in GBL usually employ an interesting narrative deliberately designed to engage the students in their learning. In GBL, scoring is essential to properly develop interest among the students [1].

In addition to more effectively motivating students to learn, immersive GBL environments also encourage them to learn from and adapt to each other’s tactics and play styles [7].

We developed this project because we think that the positive impact on achieving the goals of the game-based learning.

For more information on the effects of Game Based Learning refer to de Freitas [11] and Wilson et al. [12].

There are some game development engines that are used to develop games. Construct 2, Game Maker: Studio, Unity, Godot Engine, Unreal Engine 4, Amazon Lumberyard, CryEngine.

Construct 2 is a game development engine that you can develop 2D games with Drag and Drop.

Game Maker Studio, Like Construct 2, the game can be improved by Drag and Drop. In addition, Game Maker Language, a language similar to C, also allows developers to develop more games.



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With **Godot Engine**, both 3D and 2D games can be developed. The game can also be developed with the GDScript language, which is a Python-like language, in addition to the Drag and Drop method.

Unreal Engine 4 It has a very professional structure compared to other game development engines. Developers can provide Artificial Intelligence, Debugging, Game previews.

Amazon Lumberyard is the only AAA game engine that equips you with a combination of feature-rich development technology, native integration to the AWS Cloud, and native integration of Twitch features.

CryEngine is a game engine developed by Crytek.

In this study, Unity Game Development Engine was used.

IV. The Unity Engine

The Unity Game Development engine was developed by Unity Technologies in Denmark. Unity has integrated the PhysX physics engine and Microsoft's .NET open source libraries. With Unity's platform independence, Drag and Drop capability and physical ease, faster and better games can be developed.

In addition, documentation provided by Unity and developer communities facilitate the learning of Unity. For this reason, the developer can find a solution faster than any other problem.

It is quite easy to add an object to the game with the Drag and Drop feature and to define this object as a physical entity. In addition, these objects can be rendered functional with C # or JavaScript code.

With multi-platform distribution, a game developed at Unity can be published on all platforms. A game designed for Windows can also be published on platforms like Andorid, IOS, HTML5, Linux.

The library of Unity Game Development Engine was utilized in the development of this project.

V. Cyber Security Training in Turkey

Turkey has started to pay attention to cyber security issues. ICTA's action plans include; There is a widespread use of cyber security training in primary, secondary, high school and non-formal education, and computer users are aware of cyber security [3]. The project created in this article is a project for these two actions. A more permanent learning is aimed at providing cyber security education of students with game based learning.

VI. The Designed Learning Module Application

A character named "Guven Can" was created for the game. "Guven" means "Trust" in Turkish. The fact that the name of the character is chosen as "Guven Can" is that the players have confidence in the character and provide empathical thoughts. The players move this character and try to implement the directives given in the game. The game was designed as 3 levels with the aim of reducing the player's attention and realizing the learning objectives.



Figure 2:"Guven Can" named Character

Each level in the game has a specific learning context. At first level, they learn "Social Media Ethics", at the second level "Protection from malware and spyware" and at the third level "Cyber bullying".

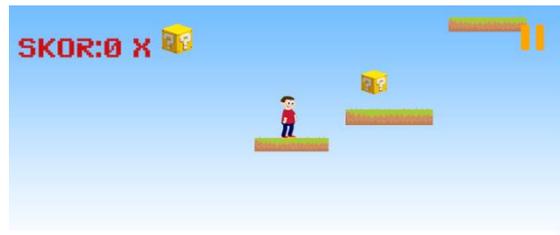


Figure 2: Level 1

At the first level, the player moves on the platforms with the Arrow Keys and collects the question boxes in front of him. These questions come out later in response to the boxes and the user answers these questions. The user gets points from every question he/she answers.



Figure 3: Character on the Question Tunnel Gate in Level 1

On the second level, the game gets a bit more difficult. At this level there are obstacles and enemies against the character. These enemies are the physically modeled states of Malware and Spyware. Players fight with him using a tool according to the incoming enemy property. No weapon is used because it is not pedagogically appropriate in this fight. In some places money symbols come in front of the character; If the player directs the character to these symbols and collects them, he loses his points. The reason for this is to prevent the Player from turning to deceptive mail and paging.

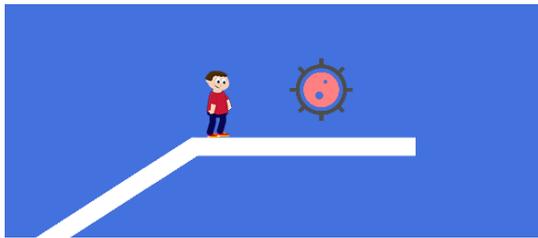


Figure 4: Virus Monster in front of Guven Can

At the third level "Cyberbullying" is performed in awareness. Against the character taunting him, cursing those who bully off enemies. The player struggles against these cyber bullies. At this stage, the Player must ensure that the character receives professional help. Otherwise the problem can not be overcome.

VII. Assessment

This game is developed; In the secondary education institutions affiliated to the Ministry of National Education, the information security that is included in the "Information Technologies and Software Course" curriculum in the 5th and 6th grade and also the 10th grade students in the Vocational and Technical Anatolian High Schools are the harmful software covered in "The Basics of Information Technologies" it is aimed to be used as material for better learning in the subjects.

In this regard, secondary and high school students learn the Basics of Cyber Safety by amusing in accordance with the Civil Safety National Action Plan.



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References

- [1] Ryoo, J., Techatassanasoontorn, A., Lee, D., & Lothian, J. (2011, June). Game-based infoSec education using OpenSim.
- [2] Craighead, J., Burke, J., & Murphy, R. (2008, September). Using the unity game engine to develop sarge: a case study. In *Proceedings of the 2008 Simulation Workshop at the International Conference on Intelligent Robots and Systems (IROS 2008)*.
- [3] Ministry of Transport, Maritime Affairs and Communications (2013), 2013-2014 National Cyber Security Strategy.
- [4] Cone, B. D., Irvine, C. E., Thompson, M. F., & Nguyen, T. D. (2007). A video game for cyber security training and awareness. *computers & security*, 26(1), 63-72.
- [5] Ryoo, J., Techatassanasoontorn, A., Lee, D., & Lothian, J. (2011). Game-based InfoSec Education Using OpenSim. *Proceedings of the 15th Colloquium for Information Systems Security Education*, 101-106. Retrieved March 05, 2018..
- [6] Rebecca Teed, Game-Based Learning, <http://serc.carleton.edu/introgeo/games/>.
- [7] Oblinger, D. (2006). "Simulations, games, and learning," Educause Learning Initiative
- [11] de Freitas, S. , (2007) "Learning in immersive worlds," A review of game-based learning. JISC e-Learning Programme
- [12] Wilson, K. A., et al., "Relationships between game attributes and learning outcomes," *Simulation and Gaming*, vol. 40, pp. 217-266, 2009.
- [13] U.S. teens & young adults social media users by age group 2017 | Statistic. (2018, January 01). Retrieved April 06, 2018, from <https://www.statista.com/statistics/250176/social-network-usage-of-us-teens-and-young-adults-by-age-group/>
- [14] Digital in 2017: Global Overview. (2017, January 24). Retrieved April 06, 2018, from <https://wearesocial.com/uk/special-reports/digital-in-2017-global-overview>
- [15] Smith, Peter K.; Mahdavi, Jess; Carvalho, Manuel; Fisher, Sonja; Russell, Shanette; Tippett, Neil (2008). "Cyberbullying: its nature and impact in secondary school pupils". *The Journal of Child Psychology and Psychiatry*. 49 (4): 376–385. doi:10.1111/j.1469-7610.2007.01846.x.
- [16] Kann, Laura; Kinchen, Steve; Shanklin, Shari L.; Flint, Katherine H.; Hawkins, Joseph; Harris, William A.; Lowry, Richard; Olsen, Emily O'Malley; McManus, Tim; Chyen, David; Whittle, Lisa; Taylor, Eboni; Demissie, Zewditu; Brener, Nancy; Thornton, Jemekia; Moore, John; Zaza, Stephanie (2014-06-13). "Youth Risk Behavior Surveillance — United States, 2013" (PDF). *Morbidity and Mortality Weekly Report (MMWR)*. Centers for Disease Control and Prevention. 63 (4): 66. Retrieved 16 February 2015.



Planning Stage of a Gamified Educational Tablet Application covering Primary Science Topics

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Abstract

This work outlines the preliminary steps of a project that covers the design, development implementation and evaluation of an educational tablet application planned for primary school students in science classes. The outline includes the design of the application unit and evaluation criteria for examining students’ understanding during and following their interaction with the application. The application is designed to cover primary school science topics on; 1) living things and life, 2) nature of matter, 3) physical events, and 4) earth and universe. Each topic is planned to proceed from elementary level competencies towards more advanced levels as the students move through progressive levels of the application. At present, elementary level competencies on living things and the nature of matter are being designed. The design includes several game elements and dynamics for increasing student engagement during the learning process. The game environment consists of a succession of islands in which the students are required to complete a series of puzzles that resemble scavenger hunt games. The evaluation criteria are based on two main dimensions: 1) cognitive demand of each puzzle in the application and 2) visual representation of the settings defining each island in the application (real-life vs. game-like representation). Each dimension is examined to understand how students with diverse characteristics interact with, engage in, and learn from the application. Student engagement will be assessed in terms of the number of puzzles the students are willing to complete during a single free-time session. An in-depth observation is planned to take place following the addition of each new stage (a new island setting) to the game environment. Both quantitative and qualitative data will be used to examine how different student groups enjoy, benefit and interact with the application.

Keywords: tablet applications, science learning, educational games

Theoretical base

Tablet computers seem to provide an intuitive and smooth way for learners to tackle with most school subjects. Tablets may prove to be effective learning tools owing to their powerful visualization means, interactive individualization possibilities that enable customization for different student needs, as well as notable affordances such as easy scalability, and portability. As tablet computers hold significant potential for improving learning gains, it is important to understand the conditions under which learning gains are optimized when using tablets as an educational tool. Because, despite their



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promising outlook and rapid rise, tablets are still not found to be effectively used for educational purposes. McEwen and Dubé (2017) point out that, although educational applications dominate 80% of the marketplace, only a small number claim that they are suitable for school use (1). Such an assertion implies that the developers themselves are hesitant concerning the suitability of their applications for formal instruction. The authors also claim that it is important to understand user-tablet interactions during the learning process and such an examination would lead to more notable outcomes if the researchers develop educational applications specifically designed for their own research purposes. The present work follows a similar line of thought. It intends to narrow down the focus of the study and work in a more controlled environment by using a tailor-made application specifically designed for pre-determined research purposes. The overall project includes the design, development, implementation and evaluation of an educational tablet application (smapps) planned for primary school students in science classes. However, the contents of this paper are limited to the work done in the preliminary stages of the project. The preliminary stages outlined in this paper include the design of the application unit and evaluation criteria for examining students' understanding during and following their interaction with the app. The design process incorporates a number of evaluation phases in order to understand how students interact and make sense of the content presented through the screen. The theoretical base for the evaluation criteria are mainly derived from the information coming from cognitive load theory (2-4), multimedia learning theory (5-6) and more specifically on models derived for user-tablet interactions (1). Based on their user-tablet communications model McEwen and Dubé (2017) indicate that tablet applications do indeed provide interactive experiences that may support or challenge cognitive capabilities of children (1). They specify that further research is required to extend on the theoretical framework that focuses on user-tablet communications by investigating the interactions between attention, cognitive load and touch screens. The findings and suggestions from the user-tablet communications model are incorporated in generation, examination and revision of the present application (smapps).

Instructional Material: Tablet Application

Content

The application (smapps) is designed to cover primary school science topics on; 1) living things and life, 2) nature of matter, 3) physical events, and 4) earth and universe. Each topic is planned to proceed from elementary level competencies (currently specified for 3rd grade) towards more advanced levels as the students move through progressive levels of the application. At present, elementary level competencies on living things and the nature of matter are being designed.



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Game elements

Design of the application (smapps) includes several game elements and dynamics in an attempt to improve student engagement during the learning process. Specific game elements such as goals, rules, scores, winnability, explicit rewards, progress linked to performance and repeated trials are included in the application structure. Users are informed of the goals, there are rules that they must obey, they receive scores and rewards for their performance, their performance is determined by how far they progress, and they are allowed to carry out repeated trials. In a more generic level, the game environment consists of a succession of islands in which the students are required to complete a series of puzzles that resemble scavenger hunt games. Each island represents a different setting (eg. farm, seaside, cave, castle, forest etc.) from which the students are expected to collect a number of items enclosed in the puzzles. In order to move on to the next island, the students must complete all the puzzles and use some items from these puzzles to create a meaningful tool that they may need during their journey between islands.

The Evaluation Process

Variables

The variables used during the evaluation process of the application (smapps) will focus on 1) the characteristics of the screen displays for each puzzle, and 2) the user characteristics. The analysis will incorporate a cross examination of both the screen displays and user characteristics in order to get feedback on user-tablet interactions.

The characteristics of the screen display is based on two main dimensions: 1) cognitive demand of each puzzle in the application (the degree of cognitive load each puzzle imposes on the information processing system) and 2) visual representation of the settings defining each island in the application (real-life vs. game-like representation). Each dimension is examined to understand how users with diverse characteristics interact with, engage in, and learn from the application.

Cognitive load

The cognitive load categories use an ordinal scale measurement to categorize the cognitive load of each puzzle into 1) low, 2) medium, and 3) high levels. The criteria used in categorization involves 1) the number of objects (sum of correct, incorrect and irrelevant responses) included in the visual display depicting each puzzle, 2) the presence of moving objects along with the static objects used in the visual displays of each puzzle, and 3) the degree of contrast between the foreground objects and the puzzle background. Figure 1 shows examples of screen displays that are categorized into low (Figure 1a), medium (Figure 1b) and high (Figure 1c) levels in terms of their cognitive load.



Figure 1. Screen examples for low (a) medium (b) high (c) cognitive load categories

Figure 1a displays a screen that exemplifies “low cognitive load” because it includes low number of static objects (<20) and medium foreground-background contrast. Figure 1b displays a screen that exemplifies “medium cognitive load” because it includes medium number of static objects (20-30) and low foreground-background contrast. Figure 1c displays a screen that exemplifies “high cognitive load” because it includes high number of static objects (>30) plus dynamic objects and low foreground-background contrast.

Visual representation of the settings

A nominal scale of measurement will be used to categorize the visual representations displayed in each puzzle into two categories showing either 1) a game-like setting, or 2) a real-life setting. The criteria used in categorization of each screen depends on whether it resembles a real or a game-like/fantasy setting. Visual displays that are categorized as real-life settings represent typical daily life scenes such as a farm, beach, classroom, theatre, museum, shop, restaurant etc. Visual displays that are categorized as game-like settings represent scenes that resemble a game/tale environment such as castles, palaces, ruins, caves etc. A daily life scene may be categorized as a game-like setting if it involves visual elements of a game/tale environment, like pirates on the beach, giant mushrooms in a forest etc. Figure 2 shows examples of screen displays that are categorized into game-like setting (Figure 2a), and real-life setting (Figure 2b) categories.



(a)



(b)

Figure 2. Screen examples for game-like setting (a) and real-life setting (b) categories

Figure 2a shows a screen that exemplifies “game-like setting” because it includes a puzzle scene that resembles a game scene or a tale environment. Figure 2b displays a screen that exemplifies “real-life setting” as the scene can be experienced in one’s daily life.

User characteristics

Cognitive and affective user characteristics will be assessed in order to understand how different users respond to screen displays varying in terms of cognitive load and visual representation. On the cognitive domain, the focus will be on how much the users have learned from the application (learning gains). On the affective domain, the focus will be on how much the users enjoy and engage during their interactions with the application (user engagement).

Learning gains will be assessed in terms student scores obtained from the closing puzzles included at the end of each phase of the application. Closing puzzles serve both as a review and an evaluation tool that are designed to give some information about student learning gains. Therefore, the questions in the closing puzzles require identification of objects that are identical or similar to those that are asked and collected throughout the game.

Figure 3 shows a typical closing puzzle with a list of example questions. The questions may have one or more correct answer. Scoring is based on the number of correct answers tapped for each question.

Puzzle layout	Example puzzle questions
	<ul style="list-style-type: none"> • A carnivore • Food from cow • Once it was a tree • Plant used to make fabric • Can fly, swim, walk • Herbivores • Used to make bread

Figure 3. Closing puzzle example

The scores obtained from each puzzle will be stored and improvements from repeated trials will be available for the users. Scores from repeated trails will also be considered for evaluation purposes.

Student engagement will be examined in terms of the number of puzzles the students are willing to complete during a single free-time session. An in-depth observation is planned to take place following the addition of each new stage (a new island setting) to the game environment.

Data Analysis

Learning gains from visuals that differ in terms of cognitive demand and visual representation of the setting will be compared to understand how load and representation affects cognitive outcome. Student engagement when using visuals that differ in terms of cognitive demand and visual representation of the setting will be compared to understand how load and representation affects affective outcome.

Both quantitative and qualitative data will be used to examine how different student groups enjoy, benefit and interact with the application. Such a cross examination between student and application characteristics is expected to provide valuable information on how cognitive load and visual aspects defining unique screens in an application might guide and shape our decisions during the design process.

References



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- (1) McEwen, R. and Dubé, A. (2017). Understanding tablet from early childhood to adulthood: Encounters with touch technology. New York: Routledge, Taylor and Francis.
- (2) Sweller, J. (1994). Cognitive load theory, learning difficulty and instructional design. *Learning and Instruction*, 4, 295-312.
- (3) Sweller, J., Van Merriënboer, J. G. and Paas, F. (1998). Cognitive architecture and Instructional design, *Educational Psychology Review*, 10, 251-296.
- (4) Paas, F., Renkl, A. and Sweller, J. (2003). Cognitive load theory and instructional design: Recent developments, *Educational Psychologist*, 38, 1-4.
- (5) Mayer, R. E. (2001). Multimedia learning. New York: Cambridge University Press.
- (6) Mayer, R. and Moreno (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist*, 38(1), 43-52



Assessment of Digital Game Playing Situations of High School Students

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Aim: The games that adolescents and young people used to play in the play grounds and on the streets have been replaced in recent years with cyber games played in front of the computer on the internet or in game arcades. This changing culture has particularly brought up the concept of "digital game addiction", a condition that stems from the steadily growing passion for digital games and their excessived and uncontrolled usage among adolescents and young people. Digital games improve the visual and attention skills of adolescents, while unconscious and excessive gaming behavior causes serious problems (1). Our aim is to assess the frequency of computer and internet use and digital game addiction in high school adolescents.

Method: 495 adolescents regarding in 9th, 10th, 11th and 12th grades in two separate high schools in the districts of the middle socioeconomic level of Ankara were included in this study. A questionnaire consisting of 54 questions related to some sociodemographic characteristics, computer and internet usage and digital game play situations was applied face to face.

Results: Four quadrants of the adolescents participating in the research are girls and three quadrants are male and the average age is 16.1 years. 92.7% of the children said that they have mobile phones and 88.1% of them said that they can connect to internet on mobile phones. 73.5% of the children said that they have computers, 70.1% had internet, and 36.8% said that they use the computer to play digital games. Nearly half of the children stated that their internet usage was restricted and prohibited by their families, but they were connected to the Internet for 2-3 hours a day. 57.8% of the children said that they played digital games and 49.7% said that they played these games online. The most frequently played games are shown in Table 1. 42.4% of the children said that they played violent games and 73.3% did not fit the classification of games. The longest average time they played without stopping at the time of their basic needs (toilet, food, etc.) is 5.3 hours (min: 30 minutes, max: 48 hours). According to the digital gaming addiction scale, 6.5% of the children are considered as digital game addicts.

Conclusion: The frequency of digital game addiction in our research is unimaginable. In the literature, the frequency of digital game addiction varies between 2-15% (2,3). In Turkey it is estimated to be increasing the frequency, but can not reveal the size of the problems encountered wide data. The most striking finding in our research is that children spend a long time playing without interruption and half play violent games. In addition, three quadrants of the children stated that they did not obey the classifications of games. This suggests that the use of new media and new technologies in our country should be supported and encouraged to become a conscious user.



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Keywords: digital games, high-school students, gaming addiction

References:

1. . Haque, A. Information Technology and Surveillance: implications For Public Administration in a New World Order. SSCR. 2005; 23:480-485.
2. Sussman CJ, Harper JM, Stahl JL, Weigle P. Internet and Video Game Addictions:Diagnosis, Epidemiology, and Neurobiology. Child Adolesc Psychiatr Clin N Am.2018; 27(2): 307-326.
3. Riedl D, Stöckl A, Nussbaumer C, Rumpold G, Sevecke K, Fuchs M. Usage patterns of internet and computer games : Results of an observational study of Tyrolean adolescents. Neuropsychiatr. 2016; 30(4):181-190.

Table 1. The most frequently played digital games by adolescents

Digital game	ESRB classification	Violence	Playing Frequency (%)
Counter Strike: Global Offensive	M (Mature 17+)	Blood, Intense Violence	38,8
PES	E (Everyone)	-	31,5
Clash of Clans	unclassified	-	26,3
Grand Theft Auto	M (Mature 17+)	Blood, Strong Language, Violence	23,8
FIFA	E (Everyone)	-	23,8
Call of Duty	unclassified	-	23,4
League of Legends	T (teen)	Blood, Fantasy Violence, Mild Suggestive Themes, Use of Alcohol and Tobacco	20,6
Need for Speed	T (teen)	Language, Mild Suggestive Themes, Mild Violence	20



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An Analysis of the Effects of the Blue Whale Game on Children and Young People

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Abstract

Today, with the development of the internet world, there is a big increase in the number of games played on the internet. Over 18 million players have been observed on the gaming platforms instantly. A lot of the games seem to have a nice time for the intended people, but not all of them have a good result. In this study, with the effect of popularity of social network, it is aimed to examine the effects of the Blue Whale game on the children and young people, which is a digital game which spreads off the social network differently from classical games and can reach suicide level. It is known that the Blue Whale game was developed by a psychology student in Russia in 2013. The report of suicide is 130 in the games for a short period of time shows how dangerous the game is. In this study in which the reasons of joining to the game, the effects and consequences of the game are analyzed, it has been determined that the children play this game because of their curiosity, the feeling of challenging and the threats of the creators. Spreading the game over the social network and gaining reputation are due to given special duties to the participants and the way of reaching the result hiddenly. It can be said that there are generally four processes in the game progress and these processes are induction, habituation, preparation and final. All the sections until the final appear to be psychological processes that have been designed to prepare participants for the finals. It has been mentioned in the study that how the game controls the children and young people In order to manipulate the psychological conditions of the participants, they were tasked with duties reducing their fear of death and raising physical pain thresholds. Within the game dynamics, the presence of a motivational program involving the use of fear psychology and self-transcendence attract the attention. This motivation program is also used to mentally prepare the victim for ultimate suicide. The findings of the research revealed that there were many reports from Russia, Europe and India. As a result of examining the reported cases, the complex upbringing, negative life experiences individuals tend to be more likely to be targets. It is noted there are children who survive with the help of their surroundings, but children and adults who have left the blue whale game may still be at risk because of their ability to commit suicide. All of these dangerous consequences, the blue whale game are ultimately described as a health risk for the adolescent, young adults, and psychologically vulnerable individuals in the world. Many countries, especially those with high suicide numbers, have published a to do and not to do list of precautions to be taken by children and their neighborhoods. Information and Communication Technologies Authority in Turkey on



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September 16, 2017 has been warning about the subject in a press release. Unlike the classic digital games, blue whale game not working on an address, not having a standard address and playing the game by sharing the special link by curators make to take precautions difficult. Precautions taken from various countries and international organizations have also been detailed in the study. In this context, to cover children to be exposed to such traps through social media and the internet and to avoid distressing events, it once again revealed the importance of parents in monitoring their children's Internet habits, determining the length of time spent at games and on the internet, and especially suspicious approaches to unknown people on the internet. Qualitative research method was used when the research was being prepared. The research is in the descriptive scanning model and the collected data is collected through the document review. The sample of the research for the sub-objectives to be searched for is the documents related to the blue whale game. There is not much scientific work on the fact that the time of the emergence of the blue whale game is new and the events taking place are in the near future. It is also observed that blue whale-style games will be anticipated in the coming days under different names. For this reason, it is important to study this area and determine the methods of prevention. For this reason, it is thought that research will shed light on future researches about blue whale game.

Keywords: Blue Whale, Game, Suicide

Introduction

With the development of the internet world, the number of the games played and players who play them also increase. Internet data volume shows a 40% increase every year [1]. It has been observed that over 18 million actors are instantly on a single platform [2]. Some of the games have negative effects on children and young people. The blue whale game seems to be quite dangerous among the games that have emerged in recent times. This study aims to investigate the effects of Blue Whale on children and young people and to investigate why and how children have completed the process up to suicide. Also, it is mentioned what needs to be done to prevent children and adolescents from being affected by adverse situations in this process.

Qualitative research method was used when research was being prepared. The research is in the descriptive scanning model and the data is collected through the document review. The sample of the research for the sub-objectives to be searched for is the documents related to the Blue Whale. In this context, a comprehensive literature search was conducted and the results of sub-titles were reached. There is not much scientific work on the fact that the time of the emergence of the Blue Whale is new and the events taking place are in the near future. It is also evident that Blue Whale-style games under different names are likely to appear in the coming days. For this reason, it is important to study in this area and determine the precautions. It is also thought that research will shed light on future research on Blue Whale.



The Danger of the Blue Whale Game - How does it confront us?

In fact, the Blue Whale is also confronted as the Blue Whale Challenge in many sources. The Blue Whale is not a downloadable game, application or software like classic games. It is a game in which the curators call the players and spread through the secret groups they invite on the social media [3]. It is seen that participants have written #i_am_whale, #bluewhalechallenge, #curatorfindme to their social media status to participate in the game [4]. It is believed that the Blue Whale is an alternative reality game of malicious youths [5]. Alternative reality games are defined as games that use real worlds as a primary platform and combine a set of medias such as video, audio, electronic mail, mobile technologies, websites, live performance and social networks [6]. It is known that the Blue Whale was developed by a psychology student in Russia in 2013 [7]. At present the developer of the game is in detention and sentenced to imprisonment because of being responsible for death at least 16 young girls who play the game [8]. Reporting suicide in 130 games for a short period of time shows how dangerous the game is [5].

In a study, it is expressed that the reasons of adolescents' participation to this game are the curiosity or some vulnerable teens looking for curators themselves [9]. The spread of the game over social networks and the gain of fame is due to the special duties given to participants and the hidden way of reaching the result [10].

The findings of the research revealed that there were many reports from Russia, Europe and India. The most searched countries for Blue Whale are Bangladesh, Pakistan, India, Sri Lanka and Italy. As a result of examining the cases reported in the game, it has been shown that individuals with negative life experiences tend to be targets [10]. Of course, only alone, depressive and suicidal individuals will perform all tasks [12]. Budeikin - the creator of the game - says that the creatures he described as biological waste damaged the society and that it only cleansed society from such humans [7].

How is the game leading the teens to suicide?

The Blue Whale generally has a method consisting of 50 missions. Although tasks can vary among players, they are generally listed in Figure 1 [8].

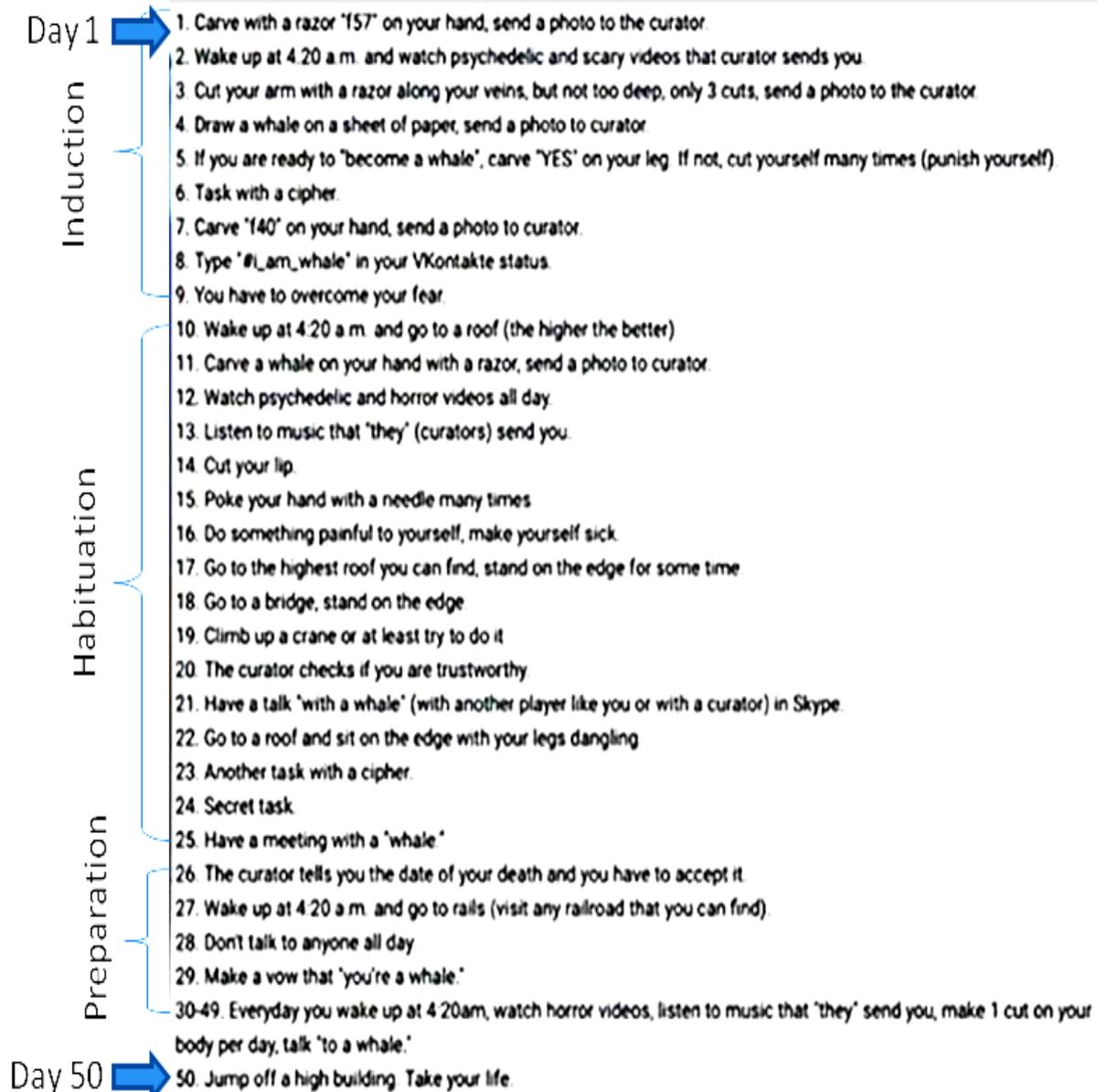


Figure 1 Task List

When we look at the tasks, it can be said that there are four processes in the game and these processes are induction, habituation, preparation and final. In induction, curators start by motivating the players against small and relatively safe damages. In habituation, they are heading for more and more dangerous missions. In preparation, the aim is to leave the majority of the actors' willingness to survive, and to make suicide more acceptable [10]. All the sections until the final appear to be psychological processes that have been designed to prepare participants for the final. It is thought that the purpose here is to give the player the ability to commit suicide. Within the game dynamics, the presence of a motivational program involving the use of fear psychology and self-transcendence is striking. The Blue Whale involves terrible missions, self-harm and awakening at unusual times, and these tasks are gradually applied in a more extreme



way [13]. This motivation program is also used to mentally prepare the victim for ultimate suicide. It is thought that some tasks are given to manipulate the psychological situations of the players and reduce their fear of death. At the same time, it is thought that the other tasks raise the physical pain threshold and prepare the participants for the finals. In many tasks there is a section for sending photos to the curator, which allows the curator to follow the player. Budeikin stated that the players were left sleepless at night in order to make their spirits more sensitive to being affected [7].

It was stated that the players who wanted to play the game were sent a virus link, and personal information was taken with punctuation attack on this videotape, and the players were exposed to threats, blackmail and cyberbullying from this information. The Children's Rights Protection Commission has also found that players are exposed to blackmail and cyberbullying in order to complete the game [3]. Curators have important knowledge related to the actors, which should be kept secret, and they do their best to blackmail the actors after starting the game [15]. At the end of the game, it is said by the curator that the participant must absolutely commit suicide, otherwise the family or loved ones will be harmed [4]. All these findings show that even if the players try to leave the game, they are forced to live in fearful moments with the tyranny and threats of the curators and prefer to continue the game. It can be assumed that players who do not perform until the final task of the game are still at risk because they may have gained the ability to commit suicide from the tasks they perform [12].

What should be done?

A number of measures must be taken in order to protect the youngsters who are curious about, want to start or have already started the game. It has been observed that when people search the bluewhale in the social networking site vk, people are still sharing to participate in this game [16]. On Facebook and Instagram, a number of suggestions and support packages come out to help you when you search for Blue Whale, including directing to befrienders.org, going out, wandering, hobbies, tranquilizing activities. In spite of all these measures, the effectiveness of the measures is uncertain because the Blue Whale differs from the classical digital games by can not be downloaded directly from the internet, not having a fixed address, not being taken from game sellers and being played by sharing special links. For all these reasons, children, relatives and their families have a great deal of work. Many countries, especially those with high suicide numbers, have published a list of measures to be taken by children and their neighborhoods to do and not to do.

Among the precautions, these can be shown: the attention should be paid to the children who are thought to have passed through difficult times, to their cuts, their listening habits and waking hours [15]. Unicef has written a paper on the issue and pointed out that the young people in the 8-19 age group are the most vulnerable and that the ones who do not have communication with their family, talk about constantly escaping from the home or die, and change their eating and sleeping habits should be taken care more. They are important duties for parents to inform children about necessary information,



to let them use the computer under the control, to let access to age-appropriate online sites, to explore the online world together, to communicate more frequently with the children, to be aware of online activities and role models for children, to monitor the children closely, to take the children who play Blue Whale away from any devices has Internet access and to ask help from the police. Teachers should be aware of students' notes, social behaviors and the awareness of the children being more sensitive to the pluses and minuses of the Internet. The teachers should inform school authorities in any suspicious case. Also, the teachers should observe the children not to let them use any harmful tools at school time [19]. Especially in 2012, when it is thought that 7.5 million users of Facebook are under 13 years old, the importance of the families' control over the children emerges [20]. Information and Communication Technologies Authority in Turkey has warned about the subject by publishing a press release on September 16, 2017. It has been explicitly stated in this statement that the families should follow their children's internet usage habits, restrict their children's use of the computer time and their games according to their ages. Moreover, the children should be warned about unknown people and if necessary they should be supported by specialists [14]. In addition, independent from the Blue Whale, the world health organization has published a list to media professionals including giving accurate information about where to get help, educating the people without myths, being careful when giving suicide news, not repeating suicide stories unnecessarily, not normalizing suicide, not to mention pictures, videos and social media links in order to prevent suicide [21].

It is possible that the Blue Whale will confront us with different versions. There are examples encountered on the Internet with both the same game style and the same game in different names [15]. In this context, the precautions taken over the relations are gaining importance. Blue Whale is a risk and vulnerability factor for teenagers who are vulnerable and have wide social network and they could be decreased by taken care of the children by the families and teachers[22]. All of these studies show that it is not possible ban this game by authorities and internet service providers. On the other hand, awareness of the families and teachers, teaching children how to behave on risky situations, regulation and control of children's internet habits are among preventive mechanisms. In an interview, Kshtrapal stated that key is not the vulnerability of a child but the ignorance of understanding these weaknesses by the adults[23].

Conclusion

In this study, it is mentioned that the reasons to play this game are curiosity, children's own desires to join the game. Also, it is mentioned the reasons to go on this game because of threat, cyber bullying and blackmailing. During the game, the tasks increasing physical pain threshold and psychological breakdown are given to children to prepare them for the final task. With the effect of the threats, players are forced to complete the final task. The fact that the game does not have a specific address, such as classic digital games, makes it difficult for authorities to take precautions. In this case, families and teachers have great duties. It is absolutely necessary for parents to be a role model for their children, to teach them the right usage on the internet, and to limit the content and



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duration of children's internet and games in relation to their age. Teachers need to take precautions by informing the authorities about any negative change by observing the behaviours of the children. With the development of the Internet world, Blue Whale-style games are predicted to become widespread and the measures to be taken are thought to be vital.

This study shows that the blue whale is a cyber attack, the blue whale is a cyber-bullying, the blue whale is a cyber terror.

References

- [1] K. Breene, "What is the future of the internet?," 5 April 2018. [Online].
- [2] 25 March 2018. [Online]. Available: <https://steamdb.info/graph/>.
- [3] 1 April 2018. [Online]. Available: <http://ncpcr.gov.in/showfile.php?lid=1499>.
- [4] A. Moloney, 20 March 2018. [Online]. Available: <http://metro.co.uk/2017/08/31/what-is-the-blue-whale-challenge-6893410/>.
- [5] V. Irina, K. Shuanat, R. Natalya and A. Leila, "FROM THE SILENT HOUSE MEME TO THE BLUE WHALE-GAME: THE STORYWORLD'S TRANSFORMATION," in *4th International Multidisciplinary Scientific Conference on Social Sciences & Arts SGEM 2017*, 2017.
- [6] M. Gilliam, A. Bouris, B. Hill and P. Jagoda, "The Source: An Alternate Reality Game to Spark STEM Interest and Learning among Underrepresented Youth," *Journal of STEM Education*, pp. 14-20, 2016.
- [7] A. Jaini, "timesofindia," 20 March 2018. [Online]. Available: <https://timesofindia.indiatimes.com/india/meet-the-22-year-old-creator-of-the-blue-whale-death-game/articleshow/59860662.cms>.
- [8] J. Taylor, "EduCare," 20 March 2018. [Online]. Available: https://www.educare.co.uk/files/cms/resources/What_is_the_blue_whale_challenge.pdf.
- [9] M. Mahadevaiah and R. B. Nayak, "Blue Whale Challenge: Perceptions of First Responders in Medical Profession," *Indian Journal of Psychological Medicine*, pp. 178-182, 2018.
- [10] A. Kumar, S. N. Pandey, V. Pareek, M. A. Faiq, N. I. Khan and V. Sharma, "Psychobiology of 'Blue Whale Suicide Challenge'," *Psychobiological determinants of 'Blue Whale Suicide Challenge' victimization: A proposition for the agency mediated mental health risk in new media age*, pp. 1-20, 2017.
- [11] "Trends," 01 April 2018. [Online]. Available: <https://trends.google.com.tr/trends/explore?q=blue%20whale>.
- [12] P. Ramamurthy, "The Blue Whale Challenge: Why do people commit suicide for an



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FULL TEXT BOOKLET

- online game?," *Journal of Current Research in Scientific Medicine*, pp. 137-138, 2017.
- [13] A. Yılmaz and Z. Biricik, "Sağlık İletişiminde Dijital Medya Kullanımının Çocuk Sağlığı Üzerine Etkileri: Sosyal Medya ve Çevrimiçi Oyunlar Üzerine Bir İnceleme," *Atatürk İletişim Dergisi*, pp. 173-186, 2017.
- [14] BTK, *BTK Uyardı: Çocuğunuzun İnternette Oynadığı Oyunlardan Mutlaka Haberdar Olun!*, T.C. BİLGİ TEKNOLOJİLERİ VE İLETİŞİM KURUMU BASIN İLE İLİŞKİLER MÜDÜRLÜĞÜ, 2017.
- [15] D. Sarkar, 23 March 2018. [Online]. Available: <https://www.news18.com/news/tech/blue-whale-challenge-why-is-it-impossible-to-ban-it-and-how-to-prevent-suicides-1493091.html>.
- [16] 30 March 2018. [Online]. Available: https://vk.com/search?c%5Bper_page%5D=40&c%5Bq%5D=bluewhalechallenge&c%5Bsection%5D=auto.
- [17] 5 March 2018. [Online]. Available: <https://www.facebook.com/help/resources/3381190/>.
- [18] 5 March 2018. [Online]. Available: <https://www.instagram.com/explore/tags/bluewhale/>.
- [19] UNICEF, "Blue Whale Challenge:What Parents Need to Know," UNICEF.
- [20] L. Magid, "Letting Children Under 13 On Facebook Could Make Them Safer," 1 April 2018. [Online].
- [21] World Health Organization, "Preventing Suicide: A Resource for Media Professionals Update 2017," Geneva, 2017.
- [22] D. F. d. Sousa, J. d. D. Q. Filho, R. d. C. P. B. Cavalcanti, A. B. d. Santos and M. L. R. Neto, *The impact of the 'Blue Whale' game in the rates of suicide: Short psychological analysis of the phenomenon*, *International Journal of Social Psychiatry*, 2017.
- [23] A. Nair-Ghaswalla, "Blue Whale Challenge, an oppurtunity to create mental-health awareness," 27 March 2018. [Online]. Available: https://www.thehindubusinessline.com/economy/blue-whale-challenge-an-opportunity-to-create-mental-health-awareness/article22681327.ece?utm_source=RSS_Feed.



Use of Digital Games in Disease Self-Management of Diabetic Children

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Abstract

Aim

The purpose of this presentation is to draw attention to the effects of digital games on the use of diabetic children in their self-management and routine health care.

Method

In this review, the key words "diabetic child, self-management, digital games" were scanned in Turkish-English from the databases "Google Academic", "PubMed" and "SAGE Journals Online". The review includes games used in both Type 1 and Type 2 diabetes management.

Results

Digital games are games played on any digital device, ranging from personal computers to game consoles, tablets or mobile phones. Games are mostly used for entertainment purposes. Nowadays, there are games that are used for non-entertainment purposes and are called 'serious games'. These games differ from fun games, learning and training. Serious digital games are an educational and entertaining type of intervention. Its use in health is also increasing. The disease self-management of diabetic children is one of these areas. Diabetes is one of the most common chronic diseases in children around the world. With different types, children usually have Type 1 Diabetes, but the incidence of Type 2 Diabetes has also increased in recent times. Regardless of the type, diabetes requires the use of technology such as diet, exercise, insulin / drug, blood glucose monitoring, the use of glucometer, dealing with complications such as hypo / hyperglycaemia, and diabetes self-management education. This lifelong process requires that the diabetic child be managed and changed behavior. In order for children with diabetes to change behavior, self-management education for children and families should be done. Diabetes self education training; is a collaborative process in which diabetic individuals acquire the knowledge and skills needed to successfully manage disease and disease-related situations and to change behavior. In this process, digital games are important interventions to improve self-management in diabetic children. Twenty-four games (Packy and Marlon, Captain Novolin, Tantei, Tamagoya, Buildup



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Blocks, INSULOT, Escape from Diab, Nanoswarm, Glucoboy, Bayer DIDGET, Testing for Hypoglycemia While Driving, The Magi and The Sleeping Star, Starbright Life Adventure Series CD-ROM, HealthSeeker, GRIP, Glymetrix Diabetes Game, The Diabetic Dog, Dbaza’s Diabetes Education for Kids, Diabetic mario, MySugr/MySugr Junio, Carb Counting with Lenny, MonsterManor, L 'AffaireBerman, Koodak-e-Tavana) related to diabetes management have been reached in the literature. These games are mostly based on prizes / reinforcements, social cognitive theory and social learning theories. It motivates children with diabetes and offers playable techniques such as grading to provide diabetic children with a risk-free space, alternative, fun and interesting way of finding and solving different scenarios for the management of the disease. In games, children are learning about basic diabetes knowledge such as diet, carbohydrate count and intake, exercise, blood glucose monitoring, insulin use for diabetes self-management, how insulin and foods affect blood glucose, eating healthy foods and using blood glucose to balance blood glucose. Children use decision making and problem solving to keep their blood glucose levels within the normal range. Children with diabetes play these games through computers, websites, mobile and wearable technologies. Those who play the game during the studies stated that the games are easy to use, enjoyable, fun, motivating, useful and should be recommended to others. In addition to these, it has been found that the level of knowledge of diabetes self-management in games increases and that stress levels decrease.

Conclusion

While the use of digital gaming in diabetic children is promising to develop diverse aspects of self-management, the majority of the work has been done in small samples, often assessing usability and satisfaction. In future studies, multidisciplinary collaboration should be undertaken to establish evidence-based studies demonstrating that the larger samples have positive effects on behaviors and clinical outcomes of digital games in diabetic children.

Key words: diabetic child, digital games, self-management,

Introduction

Diabetes Mellitus (DM) is a chronic metabolic disease that requires continuous medical care due to insulin release or insufficiency. Although Type 1 DM is most common in childhood, Type 2 DM is increasing in children today. Regardless of type, diabetes self-management education is necessary for treatment and control of DM in children with dietary self-care, oral antidiabetics / insulin therapy, physical activity, daily and quarterly monitoring of blood glucose level (1-3). While new strategies for supporting children in diabetes self-management are always evolving, digital games have gained popularity in helping children develop sustainable diabetes management habits (4, 5). Digital games, table-laptops, game consoles, mobile phones, tablets, Playstation, Xbox etc. are played through electronic platforms. Their appeal to a broad audience increases



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their ability to play online and online via Internet, and it is faced as an area of intense interest, especially by children (6).

Nowadays, digital games have become an important e-health intervention in diabetes self-management. These games, which are used for education together with entertainment, are called serious games. Thanks to technology, these serious games have become a popular social activity that children find challenging and entertaining, and make them available for health management. Serious games in diabetes self-management make funny learning for children, providing life-long learning experiences by doing (4, 5, 7). While game allows children to rehearse their skills over and over again, it can provide basic information about diabetes management. Research shows that serious games are a promising method of helping to better understand diabetes, manage symptoms, and solve problems in making right choices in diabetes care (8-10). The purpose of this presentation is to draw attention to effects of digital games on use of diabetic children in their self-management and routine health care.

Method

In review, keywords "diabetic children, digital games, self-management " were scanned in Turkish-English from databases "Google Academic", "PubMed", "SAGE Journals Online" and related publications were included in study. Digital plays used in diabetic children, theories and models on which games are based, platforms used, target groups, educational contents and results of game use are discussed in studies. The review includes games for both Type 1 (T1DM) and Type 2 (T2DM) Diabetes Mellitus management.

Results

Despite the fact that history of games is very old, development of games for diabetes self-management dates back to 1990s. Twenty-four games related to diabetes management were found in literature in study (4-33). It has been determined that these games are often based on awards / reinforcements, social cognitive theory, social learning theories, and transtheoretical models (4-33).

The first game to target children with T1DM in diabetes self-management is Captain Novolin in 1992. Captain Novolin is a self-regulation video game that shows relationship between food, insulin and blood sugar control. The main character is a superb hero who must avoid victims of plane crashes from a mountain by salvage buns, ice cream and sodas when they are fighting with enemies. The player must make food and insulin choices and monitor blood sugar level of superhero. The play was evaluated by their children with diabetes (8-14 years of age) (n = 23). Children have stated that playing games is easy, and supports their parents to talk about diabetes (11-13).

Packy and Marlon that 8-16 years children with T1DM (n = 31) in 1995 were evaluated. In game, diabetic elephant heroes (Packy and Marlon) remain in search of food and diabetic supplies to save camp that mice occupy. The players guide to elephant when



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they meet with difficulties in game, and they monitor blood glucose at normal limits by measuring blood glucose, taking insulin and selecting appropriate foods from food groups. In a 6-month randomized clinical trial with children and adolescents with T1DM, it was determined that this game improved diabetes-related self-efficacy, parental communication and self-care behaviors, and reduced emergency care and emergency visits for diabetes by 77%. However, there was no significant change in knowledge about diabetes and HbA1c levels (4, 14).

Detective, Buildup Blocks and Egg Breeder are three Japanese diabetes self-management games, published in 2004. The first two are Game Boy Advance handheld game system, Egg Breeder is a computer game. It was created for children who were recently diagnosed with diabetes to provide basic information about diabetes and to help rehearse self-management. As players rehearse problem-solving methods for diabetes self-management, game deals with diet, exercise, blood sugar monitoring, insulin use, and medical adherence. In a pilot study with children, it was determined that use of three games was easy and fun, and provided information that players perceived as useful (4, 12, 15).

Insulot is a game played as a tablet or phone application. It was developed in 2005 to teach children and adolescents with T1DM between ages of 12-24 effect of insulin consumption and blood sugar levels on blood glucose levels. The players should determine appropriate dose of insulin according to level of blood glucose and carbohydrates in a particular food or lunch. Those who conducted 2005 game evaluation (n = 30) found game interesting, 80% thought it would be useful for diabetes management and should be recommended for T1DM. The results of study involve only usability and satisfaction assessment, and game does not contain user information or data on effect on behavior (16).

Escape from Diab and Nanoswarm; to educate and motivate young people with T2DM to make healthier food choices and increase physical activity. While learning about healthy habits, setting goals, making decisions about food choices and exercise balance, players help Escape from Diab and characters fighting in a space adventure escape from a bad king (Nanoswarm), struggling with unhealthy habits. A randomized controlled study of 153 children aged 10-12 years (control n = 50, intervention n = 103) was conducted to determine effects of games, fruit and vegetable consumption, water consumption, level of physical activity, Findings showed that those who played T2DM related games increased their consumption of fruit and vegetables compared to comparison group. The results of water intake, physical activity and body composition were not significantly affected. These two games combine knowledge acquisition, modeling and understanding, and skill applications that increase self-sufficiency and ultimately lead to behavioral change. However, this study only measured behavioral and clinical outcomes and did not measure factors such as self-efficacy to determine mechanism that triggers these changes (17, 18). Several theories such as social-cognitive, self-determination, behavioral inoculation, and transportation theories have contributed to behavior modification procedures (19).



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Glucoboy is a blood glucose measuring device that can be connected to Game Boy Advance or Game Boy DS. In game is awarded with points that allow him to unlock games when measuring blood glucose to player. If blood sugar of user drops to specified targets, more points are awarded. Usage is only offered in Australia (12, 20).

In 2010 Didget'te "Knock 'em down: World's fair" gives users chance to monitor consistent blood glucose and reach target blood glucose levels, opening game's new levels. This game used a reward system supported by social cognitive theory that uses scores and higher game-level access to promote regular blood glucose monitoring. In studies on children, children found device to be sensitive and clinically correct, and most parents considered it easy to use, motivating and helpful. Health personnel also stated that system in diabetes management meets a need (8, 21).

Testing for Hypoglycemia While Driving is a blood glucose awareness training program. It is necessary for players to decide what action to take regarding their blood sugar levels and time to and from school. Phase 1 and 2 levels are available. It is necessary to find solutions to specific scenarios in phases. It aims to change attitudes of children and parents as well as change their knowledge on hypoglycemia and driving (22).

The Magi and The Sleeping Star is an action-adventure diabetes simulation video game that was announced in 2009 and has not been published yet. The player in game is a magician with a Magi type 1 diabetes. While using his magical talents to defeat enemies, he is on a quest to save world. Magi's magic power is an indication of how well blood glucose level is governed by making appropriate insulin and nutritional choices in player's play (4).

Star Bright Life Adventures is a computer game that teaches 5-10 year old children with diabetes during an interactive day of your life. The game offers quick exercises, quizzes and additional game style challenges that provide information to help players have more control over their illnesses. Conclusion studies have shown that they develop knowledge and disease self-management (12, 23).

Published in 2010, HealthSeeker is first health game on Facebook to help improve health of diabetic individuals through lifestyle changes. The game can also be used as an app for Android and iOS devices. Designed with Transtheoretic Model. HealthSeeker provides a supportive social networking environment for diabetic adults with important information about diabetes management or prediabetes. The game includes specific missions to help players to achieve certain lifestyle goals, such as eating healthier, getting most appropriate weight, or lowering blood sugar levels. They succeed to reward healthy behaviors, use virtual prizes and gifts (4, 24, 25).

The GRIP is a Dutch diabetes self-management game designed to link health information from patient's personal electronic medical record file to a game in which players learn to make decisions based on decision-making and current personal health information. The game allows parents and clinicians to monitor patient's condition over time. The players observe how daily activities and food choices affect blood glucose levels. (4, 26).



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The Glymetrix Diabetes Game provides exam games and card games that quiz users' knowledge of diabetes self-management. The user is awarded a prize if he enters his blood sugar level. The results of game have not been evaluated (4).

Diabetic dog is an online flash game where user must look for diabetic pet dogs. Audience is a child with type 1 diabetes. The game involves administration of blood glucose through testing, insulin and appropriate diet. The game has not been properly assessed (4).

Published in 2003 for children, Dbaza's Diabetes Education is a computer program developed to teach children about diabetes and self-management of diabetic children. It provides basic information about self-care and blood sugar monitoring and offers opportunities to rehearse common social situations that include diabetes self-care needs. A pilot study with diabetic children found that they enjoyed program and gained knowledge of diabetes self-management and continued knowledge in a one-month postponed post-test (12, 27).

The main character of Diabetic Mario game is supposed to be Mario's diabetes. Mario's health problems are problems that must be solved by player. The goal of game is to save a princess locked in a hill. To achieve this goal, Mario must manage blood glucose levels while fighting against various evil guards at various stages of game. As children progress through game, they gradually learn to remain healthy by choosing appropriate food choices, modulating use of physically active and insulin. The results of game play show participants have more information about healthy eating and lifestyle by playing Mario Bros mobile game for 1 week. It also reveals that participants' trust increases after pre-event participation in selecting healthy eating preferences and regular exercise habits. More work is needed to study effect of game (28).

MySugr and MySugr Junior are T1DM mobile applications. Users should select and name a monster that needs to be "domestic" or "docile" by recording daily self-management activities, including daily blood glucose levels, insulin management, food and carbohydrate intake, mood or symptoms. By applying knowledge, users can collect points that they can use to feed their monsters, and they can choose different monsters when moving at different vehicle levels. In this way, MySugr uses a reward system adopted in social cognitive theory to provide incentives to strengthen coherent self-management strategies. No studies have been identified to examine effect of MySugr on user behavior, knowledge, or clinical indicators (29, 30).

Lenny and Carb Counting is a mobile application that includes four different games to teach you how to differentiate carbohydrate types, how to distinguish between different carbohydrate types, what to eat and what to eat according to nutritional guidelines. While game's main character, Lenny, is a lion with T1DM, game can also be useful for managing food choices for learning at T2DM. At the same time, Lenny and Carb Counting can help children with T1DM get more responsibility for their own food choices for their



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own families. No study data has been reported about acquisition or effect of this game (18, 31).

Monster Manor is a smart phone-based game developed in UK in 2012. Children between ages of 6 and 10 with type 1 diabetes are expected to take responsibility for measuring and recording their own blood sugar. Measuring and recording blood sugar of player provides positive feedback to ensure that children's self-care is concerned with this important aspect. Monster Manor uses a motivational system for daily monitoring and work of blood glucose levels for users monsters and rewards, allowing users to create their own monsters, gain access to new rooms of monster's house, and collect points to purchase their pets (18, 24).

L'Affaire Birman is actually based on problem solving about diabetes. The player must direct game's main character Alex, T1DM, during an amusing quest. L'Affaire Birman says use of serious games, LUDIDIAB four French university hospital in pediatric section of project to investigate whether young T1DM patients improves their knowledge and skills was conducted. This pilot study; demonstrates that use of digital gaming has improved knowledge of children with T1D, particularly with respect to carbohydrate measurement and insulin delivery. The fact that this study was conducted on a small sample size suggests that there is little statistical power to play game three times per patient, depending on whether game is inactive or children are less dependent on game. (18, 32).

Koodak-e-Tavana is a computer game based on simulations of both observational learning and skill practice. It allows practitioner to practice practicing insulin injecting skills. This game was found to be successful in creating an environment for children and parents to learn how to administer insulin and how to reduce anxiety. In a small randomized control trial of 30 children and their parents, those who played game at least once a week found that they had fewer risk scores. However, self-efficacy factors have not been measured as part of study (18, 33, 34).

Conclusion

The use of digital gaming in diabetic children seems promising not to improve self-management behaviors. However, fact that theoretical frameworks are not specified in majority of studies carried out are among limited cases in which small samples are usually evaluated for usability and satisfaction. Future work will require multidisciplinary collaboration to provide evidence-based studies demonstrating that digital games are assessing self-efficacy in older children with diabetes, and positive effects on behaviors and clinical outcomes.

References

1. The American Diabetes Association, Standards of Medical Care in Diabetes, Retrieved from:http://care.diabetesjournals.org/content/diacare/suppl/2017/12/08/41.Supp%201.DC1/DC_41_S1_Combined.pdf, Retrieved date: 05.04.2018.



International Child and Information Safety Congress
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2. Childhood Diabetes Educator Guide, Retrieved from: <http://beslenme.gov.tr/content/files/diyabet/cocuklukCagiDiyabetiEgiticiRehberi.pdf>, Retrieved date: 12.03.2018.
3. American Association of Diabetes Educators, Self-Care Behaviors, Retrieved from: <https://www.diabeteseducator.org/living-with-diabetes/aade7-self-care-behaviors>, Retrieved date: 10.03.2018.
4. Lieberman, D.A. (2012). Video games for diabetes self-management: examples and design strategies. *J Diabetes Sci Technol*, 6(4), 802-806.
5. Skip Rizzo, A., Lange, B., Suma, E.A., Bolas, M. (2011). Virtual reality and interactive digital game technology: new tools to address obesity and diabetes. *J Diabetes Sci Technol*, 5(2), 256-264.
6. Taylan, H.H., Kara, H.Z., Durgun, A. (2017). A study on computer game habits and game preferences of secondary and high school students. *PESA International Journal of Social Studies*, 3(1), 78-87.
7. Krriemuir, J.(2002). A survey of the use of computer and video games in classrooms. internal report for british educational communications and technology agency, Retrieved from: <http://www.digra.org/wp-content/uploads/digital-library/05150.28025.pdf>, Retrieved date: 15.03.2018.
8. Klingensmith, G.J., Aisenberg, J., Kaufman, F., Halvorson, M., Cruz, E., Riordan, M.E., Varma, C et al. (2013). Evaluation of a combined blood glucose monitoring and gaming system (Didget®) for motivation in children, adolescents, and young adults with type 1 diabetes. *Pediatr Diabetes*, 14(5):350-357. doi: 10.1111/j.1399-5448.2011.00791.x.
9. Padman, R., Jaladi, S., Kim, S., Kumar, S., Orbeta, P., Rudolph, K et al. (2013). An evaluation framework and a pilot study of a mobile platform for diabetes self-management: insights from pediatric users. *Stud Health Technol Inform*, 192(1), 333–337.
10. Henkemans, O.A.B., Bierman, B.P.B., Janssen, J., Neerincx, M.A., Looije, R., van der Bosch H et al. (2013). Using a robot to personalize health education for children with diabetes type 1: a pilot study. *Patient Educ Couns*, 92(2), 174–181.
11. Lieberman, D.A. (1997). Interactive video games for health promotion: Effects on knowledge, self-efficacy, social support, and health. Chapter in R.L. Street, W.R. Gold, & T. Manning (Eds.), *Health promotion and interactive technology: Theoretical applications and future directions*. Mahwah, NJ: Lawrence Erlbaum Associates, pp. 103-120.
12. DeShazo, J., Harris, L., Pratt, W. (2010). Effective intervention or child's play? A review of video games for diabetes education. *Diabetes technology & therapeutics*, 12(10), 815-822.
13. Lieberman, D.A. Effects on knowledge, self-efficacy, social support. *health promotion and interactive technology: theoretical applications and future directions*, pp 103, 2013.



International Child and Information Safety Congress
"Digital Games"
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14. [Brown, S.J.](#), [Lieberman, D.A.](#), [Germeny, B.A.](#), [Fan, Y.C.](#), [Wilson, D.M.](#), [Pasta, D.J.](#) (1997). Educational video game for juvenile diabetes: results of a controlled trial. *Med Inform (Lond)*. 22(1):77-89.
15. [Aoki, N.](#), [Ohta, S.](#), [Masuda, H.](#), [Naito, T.](#), [Sawai, T.](#), [Nishida, K](#) et al. (2004). Edutainment tools for initial education of type-1 diabetes mellitus: initial diabetes education with fun. *Stud Health Technol Inform*, 107(2), 855-859.
16. Aoki, N., Ohta, S., Okada, T., Oishi, M., Fukui, T. (2005). INSULOT: a cellular phone-based edutainment learning tool for children with type 1 diabetes. *Diabetes Care*, 28(3), 760.
17. Baranowski, T., Thompson, D., Buday, R., et al. (2011). Video game play, child diet, and physical activity behavior change: a randomized clinical trial. *Am J Prev Med*, 40(1), 33-38.
18. [Swartwout, E.](#), [El-Zein, A.](#), [Deyo, P.](#), [Sweenie, R.](#), [Streisand, R.](#) (2016). Use of Gaming in Self-Management of Diabetes in Teens. *Curr Diab Rep*, 16(7), 59. doi: 10.1007/s11892-016-0754-2.
19. Thompson, D., Baranowski, T., Buday, R., Baranowski, J., Thompson, V., Jago, R et al. (2010). Serious video games for health how behavioral science guided the development of a serious video game. *Simul Gaming*, 41(4), 587-606.
20. Patterson, N., Wolfenstein, M., Millar, S., Halverson, R., Squire, K. (2011). Games and simulations for diabetes education (WCER Working Paper No. 2011-1). Retrieved from <http://www.wcer.wisc.edu/publications/workingPapers/papers.php>, Retrieved date: 05.04.2017.
21. Deeb, L.C., Parkes, J.L., Pardo, S., Schachner, H.C., Viggiani, M.T., Wallace, J et al. (2011). Performance of the DIDGET blood glucose monitoring system in children, teens, and young adults. *J Diabetes Sci Technol.*, 5(5), 1157-1163.
22. Jacko, J.A. (2009). Human-computer interaction. interacting in various application domains 13th international conference, HCI International, USA, pp 19-24.
23. Halvorson, M., Kaufman F., Engilman R. (1999). Comparison of a diabetes cd-rom program, diabetes video game and diabetes kids class in diabetes management and knowledge acquisition in children ages 5-10 with type 1 diabetes. In *Diabetes*, 48, 73.
24. Boulos, M.N., Gammon, S., Dixon, M.C., MacRury, S.M., Fergusson, M.J. et al. (2015). Digital games for type 1 and type 2 diabetes: underpinning theory with three illustrative examples. *JMIR Serious Games*, 18;3(1), 3. doi: 10.2196/games.3930.
25. Klauser, M., Nacke, L.E., Prescod, P. (2013). Social player analytics in a Facebook health game. In: *Proceedings of the CHI 2013 Workshop on Designing and Evaluating Sociability in Online Video Games*. 2013 France p. 39-44.
26. Kyfonidis, C., Lennon M. (2015). Digital Educational Game for Children With Type 1 Diabetes. *Proceedings of BCS Health Informatics Scotland Conference*. Retrieved From: <https://pdfs.semanticscholar.org/9919/bd78b7b8acea9041d09c634c101c892c3e5f.pdf>



International Child and Information Safety Congress
"Digital Games"
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FULL TEXT BOOKLET

27. Barbara, M. (2010). Hayes and William Aspray, Health Informatics: A Patient-Centered Approach to Diabetes, The MIT Press, England, pp 134-135.
28. Baghaei, N., Nandigam, D., Casey, J., Direito, A., Maddison, R. (2016). Diabetic Mario: Designing and Evaluating Mobile Games for Diabetes Education. Games Health J, 5(4), 270-278. doi: 10.1089/g4h.2015.0038.
29. The MySugr Game, Retrived from: <https://mysugr.com>, Retrived date: 01.01.2018
30. Hoskins, M. (2015). 'Diabetes Monster' app actually motivates. Retrived from: <http://www.healthline.com/diabetesmine/diabetes-monster-app-actually-motivates#3> Retrived from: 19. 08.2014.
31. Cogen F. Carb Counting with Lenny. Retrived from: <http://www.healthcentral.com/diabetes/c/651280/133072/counting-lenny/>
32. Joubert, M., Armand, C., Morera, J., Tokayeva, L., Guillaume, A., Reznik, Y. (2016). Impact of a serious videogame designed for flexible insulin therapy on the knowledge and behaviors of children with type 1 diabetes: The LUDIDIAB pilot study. Diabetes Technol Ther, 18(2), 52-8. doi: 10.1089/dia.2015.0227.
33. Ebrahimpour, F., Najafi, M., Sadeghi, N. (2014). The design and development of a computer game on insulin injection. Electron Physician, 6(2), 845–855.
34. Ebrahimpour, F., Sadeghi, N., Najafi, M., Iraj, B., Shahrokhi, A. (2015). Effect of playing interactive computer game on distress of insulin injection among type 1 diabetic children. Iran J Pediatr, 25(3), 427.



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ORAL PRESENTATIONS



Relationship between Online Game Addiction and Peer Bullying

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Abstract

Computer game addiction is a growing health problem all over the world. Today, many family homes have computers and internet, mobile phones and tablet computers. Because of this, children have the opportunity to access computer games more easily. The fact that computer games are playable via the internet can cause children to move away from face-to-face communication with friends, limit social skills and cause social anxiety. In addition, the majority of online games are violent, which creates other problems.

In this study, we aimed to investigate the relationship between online game addiction and peer bullying in the adolescent age group.

Materials and Methods: 400 adolescents between the ages of 12 and 18 who applied to the children's polyclinic for various reasons were included in the study. Twelve cases that did not return scales and eight cases with incomplete scales were excluded from the study group and a total of 380 cases were completed.

A questionnaire consisting of 22 questions about sociodemographic data, an online game addiction scale and peer bullying (adolescent form) were given to the cases. The online game addiction scale consists of 21 questions; the peer bullying scale consists of 53 questions evaluating the subgroups of physical bullying (15 questions), verbal bullying (7 questions), exclusion (6 questions), rumor (5 questions), harm to personal belongings (10 questions) and sexual bullying (10 questions). Individuals who bully others are referred to as bully and individuals who are victims of bullying are referred to as victim on the scale. In evaluating these scales; the minimum score is 21 and the maximum score is 105 for the online game addiction scale. For the peer bullying scale, possible scores are between minimum 53 and maximum 265 points. In both scales, as the score increases, game addiction and peer bullying increase.

Findings: The mean age of the study group was 17 years (12-18) and 63.7% (n = 242) was female. 89.5% of the adolescents went to school, and 61.3% stated that their school success was good. 97.4% (n = 370) of adolescents had their own cell phone and 86.3% (n = 328) had their own computer. Facebook membership was 55%, Instagram membership was 83.7% and twitter membership was 30.5%. 54.2% of the adolescents preferred to watch comedy movies, 28.7% preferred war movies and 17.1% liked to watch drama movies.

The study group's online game addiction scale mean score was 52.9 ± 18.2 , the peer bullying-victim scale mean score was 148.8 ± 79.6 , and the peer bullying-bullying scale



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score was 150 ± 83.1 . 88.4% of the adolescents said they played online games. The average game addiction scale for girls was 50 ± 17.6 and 56.4 ± 18.5 for males and this score was statistically higher in males ($p = 0.004$). There was no significant difference between peer bullying scale point average and gender. There was no significant relationship between online game addiction scale and peer bullying scale point average, school attendance and school achievement ($p > 0.05$). The average score of online game dependency score of war movie watching was higher than the average score of comedy and drama movie viewing ($p = 0.001$). There was no significant relationship between the mean score of the peer bullying scale and the type of film watched ($p > 0.05$).

No significant relationship was found between the average score of the online game addiction scale and the score average of the peer bullying-victim scale and the average score of the peer bullying-bullying scale ($p = 0.727$ $r = 0.020$, $p = 0.500$ $r = 0.038$)

Conclusion: Adolescents were found to have a high frequency of online gaming and males were found to have a higher frequency than females. In addition, the average score of the online gaming addiction scale was higher for violent movie viewers. There was no correlation between peer bullying and online game addiction. This is thought to be due to the fact that the group, which does not play online games, is small. More studies are needed in this area.

Key words: Adolescent, online game addiction, Peer Bullying

Introduction

Games are important tools that help children to develop their social and mental skills that affect their social relationships. Thanks to games, children play along with their friends, develop their communication skills, self-expression, friendships, and social skills to establish new relationships (1, 2). Internet and computers make our lives easier by improving interpersonal communication, and allow for entertainment time by making it easy to access information and content such as movies, music, video, games etc. Because of these reasons, it has become an indispensable part of today's life (3). However, internet and computer games have also brought some problems. The increase in the number of individuals who constantly connect to the internet and therefore have many problems in their lives has created the concept of “internet addiction” (4). Although computer addiction does not have a standard definition, it is considered as a behavior addiction and it is used as a concept that expresses harmful, uncontrolled, and long-term use of computers (5-8).

In some studies, it has been reported that there is a significant increase in the ratio of children playing computer games (9-11). With this increase, the rate of addiction also increases. Computer games do not only lead to addiction, but also affect children's behavior and brain function. It has been reported that game addiction causes negative situations such as sleep deprivation, decreased school attendance, difficulty in joining family-friend programs, separation from a variety of tasks or participation in a sports



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team, conflicts in social relations, depression, anxiety, somatization, anger, aggression, hostility and stress (12 -14). Zboralski et al. (15) found that excessive computer and internet use was associated with high levels of aggression and anxiety. In addition, the adolescents spending a long and uncontrolled time on the Internet with increasing frequency negatively affect their peer relations. Adolescents whose communication skills decrease due to heavy internet use also experience decline in some personality characteristics such as courage, taking initiatives, communication and they may prefer to have online friends or stay solitary instead of having real friends (16).

Violence is an increasing problem in every part of society and it negatively affects individuals. In recent years, violence is also increasing in schools (17-18). Violence in schools appears not only as aggression but also as peer bullying (19, 20). When we examined the literature, we couldn't find any study investigating the existence of a relationship between online computer game addiction and peer bullying. Therefore, we aimed to investigate whether online gaming addiction in adolescent age group relates to increased peer bullying among students.

Materials and Methods

We administered a questionnaire to 400 adolescents between 12 and 18 years of age who were admitted to the pediatric outpatient clinic. The study was completed with a total of 380 cases excluding 12 cases who did not return the scales and 8 cases with incomplete filling. The questionnaire included several parts. For collecting sociodemographic data it had 22 questions. It also included, online game addiction scale (OGAS) and peer bullying (adolescent form) scale.

Online game addiction scale consisted of 21 questions evaluating subgroups of disruptions factor (9 questions), success factor (8 questions) and economic gain factor (4 questions). The validity and reliability study of this scale was done by Kaya A. The adolescents could get a minimum score of 21 and a maximum score of 105 from this scale (21). Peer bullying scale included the subgroups of physical (15 questions), verbal (7 questions), exclusion (6 questions), spreading rumor (5 questions), damage to items (10 questions) and sexual bullying (10 questions). The scale consisted of 53 questions in total (19). In the scale, those who bully are referred to as 'bully' and the bully victims were referred to as 'victim'. The validity and reliability study of this scale was done by Külcü A. The minimum possible score of the scale is 53 and the maximum possible score is 265. As the scores on both scales increased, game addiction and peer bullying were increased.

Permission was obtained from the families, adolescents and the ethics committee of our hospital with the permission document number of 0036 and date of 14.02.2018. The data were evaluated in SPSS 20.0 package program and the results were considered statistically significant for $p < 0.05$ values.

Findings

The median age of the study group was 17 years (12-18) and 63.7% (n = 242) were female. Age distribution of adolescents according to gender was similar (p = 0.677). 89.5% of adolescents were attending school. 97.4% (n = 370) of the adolescents had their own phone, 86.3% (n = 328) had their own computer. Facebook membership was 55% (n = 209), Instagram membership was 83.7% (n = 318) and Twitter membership was 30.5% (n = 116). Number of individuals with Facebook and Instagram membership were 195, Twitter and Instagram members were 111, Facebook and Twitter members were 80 and Facebook, Instagram and Twitter members were 50. 90.3% of adolescents (n = 343) had internet connection at home. Of the adolescents, 54.2% (n = 206) enjoyed comedy, 28.7% (n = 109) war, and 17.1% (n = 65) drama movies (Table 1).

The median age of the mothers was 41.5 years (31-60) and the median age of the fathers was 45 years (34-76). 2.1% of the mothers (n = 8) were not literate, 37.1% (n = 141) were primary school, 27.9% (n = 106) were secondary school and 32.9% (n = 125) were high school or university graduates. Of fathers, 1.5% (n = 6) were not literate, 24.5% (n = 93) were primary school, 29% (n = 110) were secondary school and 45% (n = 171) were high school or university graduates. 97.9% (n = 372) of the parents had a mobile phone and 41.1% (n = 156) of the mothers and 45% (n = 171) of the fathers were playing games on their mobile phones.

88.4% of adolescents (n = 336) said that they play online games. 17.3% of the gamers (n = 58) stated that they played 2-3 hours, 9.5% (n = 32) <1 hour and 73.2% (n = 246) >3 hours daily on the computer (Table 1). 68.1% of adolescents stated that their parents did not know which games they played. A total of 345 participants responded to the questions about knowledge of parents about the games their children play (Table 2).

The OGAS mean score of the study group was 52.9 ± 18.2 . The mean of the OGAS scale was 50 ± 17.6 in females and 56.4 ± 18.5 in males and it was statistically higher in males (p = 0.004). There was no significant correlation between the mean score of online game addiction scale and school attendance (p = 0.267). The mean score of those who watched war/fighting films (58.3 ± 20.4) was higher than the mean score of those who watched comedy films (50.5 ± 16.2) and drama films (51.2 ± 18.3) (p = 0.001). As parents education level increased, the mean OGAS score of the children increased. No significant relationship was found between computer ownership and the mean of OGAS (p = 0.821). The mean OGAS score of those who played >3 hours a day was significantly higher than those who played <1 hour and 2-3 hours a day (p = 0.001) (Table 3).

The mean score of the peer bullying-victim scale was 148.8 ± 79.6 and the mean score of peer bullying-bully scale was 150 ± 83.1 . There was no significant difference between the mean score of peer bullying scale and gender. There was no significant correlation between the mean score of peer bullying scale and school attendance (p = 0.965). No significant relationship was found between the mean peer bullying scale score and the preferred type of movies, parental education level and computer ownership (p > 0.05).



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The mean score of the peer bullying-bully and peer bullying-victim scale was found to be significantly higher in those who played online games for >3 hours a day compared to those who played <1 hour a day ($p = 0.001$) (Table 3).

Discussion

Computer and internet have made life easier in many areas and have become an increasingly popular area for game playing and entertainment. Due to the increasing urbanization and the lack of playgrounds, the games that children play on the street have been replaced by digital games. Young people are more interested in digital games and the time they spend playing these games is increasing (1, 3).

In studies, it is reported that excessive game play and addiction are more prevalent in male adolescents than females between the ages of 10 and 18 and that addiction to computer games causes depression, aggression and tendency towards violence (1-3). Yıldız et al. (2) reported that computer addiction was more common in males than females, and that males are more likely to be disturbed when they are prevented from playing. Similarly, in our study, the mean of OGAS was higher in males.

It has been reported that computer game addiction increase as the education level of parents increases (1, 6). Similarly, in our study, we found that as the education level of parents increase, it becomes easier to access to computers and this may lead to an increase in computer addiction. In addition, with the increase in mother's level of education, the mother spent more time outside the house, she had to do housework when she came home and she could not control her children too much. Therefore it was thought that the children spent more time on computers. There was no correlation between the educational level of the parents and the peer bullying scales. In the studies conducted, no relationship was found between the education level of parents and peer bullying scales (19, 22).

In our study, the scores of adolescent who preferred to watch movies with violent content were found to have higher OGAS scores. Adolescents were thought to reflect the violence they learned to in game addiction. Play time is also important in game addiction. In a study conducted by Öncel et al. (23) with primary school students, they found that female students had more addiction to games and 67.6% of all children in the study had less than 1 hour, 28.2% had 1-3 hours, 1.4% had 3-5 hours, and 2.8% had more than 5 hours of play time each day. Kelleci et al (24) found in their study that; 70.2% of females, 60.2% of males had 1-2 hours / day, 25.2% of females, 23.1% of males had 3-4 hours / day, 4.5% of females, 16.8% of males had 5 hours / days for spending time on the internet. Similarly, 73.2% of the adolescents in our study stated that they played online games for more than 3 hours a day, and this group was found to have higher scores of OGAS.

Violence among peers in schools in the world and in our country is common. It is accepted that bullying is a serious trauma for the students, its effects are not limited to school period but continue for a lifetime and they have a negative impact on public



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health (25). We hypothesized that bully behaviors may have been learned from online games that children increasingly play in recent years, but we found no correlation between the average OGAS scores of adolescents and peer bullying-bully and peer bullying-victim scores.

As a result; in the adolescent age group, the frequency of playing online games was high and the online game addiction in males was higher. There was no relationship between peer bullying and online game addiction. This was thought to be due to the fact that the number of participants in our study group who did not play online games was low. New studies are needed in this subject area.

References

1. Horzum M.B.(2011) Examining computer game addiction level of primary school students in terms of different variables. *Education and Science*.36(159): 56-68.
2. Yildiz E, Tufekci F.G, Aksu E (2016). The Relationship Between Computer Game Addiction and Social Anxiety in Children and Affecting Factors. *Turkiye Klinikleri J Public Health Nurs-Special Topics*. 2(1): 54-60.
3. Irmak A.Y, Erdogan S. (2016). Digital game addiction in adolescents and young adults: a current overview. *Turkish Psychiatry Review* 27(2): 128-37.
4. Davis, R. A. (2001). A cognitive-behavioral model of pathological internet use. *Computers in Human Behavior*, 17, 187-195.
5. Peltoniemi, T. (2002). Net addiction in Finland. *First Pervnet Conference of Telematics in Addiction Prevention*, Atina, Yunanistan.
6. Sahin C, Tugrul V.M.(2012) Investigation of computer game dependency levels of primary school students. *Zeitschrift für die welt der Türken / J world of Turks*. 4(3): 115-130.
7. Gentile DA (2009) Pathological video game use among youth 8 to 18: A national study. *Psychol Sci* 20: 594-602.
8. Desai RA, Krishnan-Sarin S, Cavallo D et al. (2010) Video-gaming among high school students: Health correlates, gender differences, and problem atic gaming. *Pediatrics* 43:173–183.
9. Kuss DJ, Griffiths MD. (2012) Online gaming addiction in children and adolescents: A review of empirical research. *J Behav Addict*.1(1):3-22.
10. Harris J (2001) The effects of computer games on young children: A review of the research. *J Amer Academy of child adolescent*. 72 (22): 1-30.
11. Onay P.D. Tufekci A, Cagiltay K. (2005). Students Playing Computer Game Habits and Preferences Games in Turkey: A comparative study between METU and Gazi University students, *Training Conference on Information Technologies*, Ankara.
12. Lemos IL, Abreu CN, Sougey EB (2014). Internet and video game addictions: a cognitive behavioral approach. *Revista de Psiquiatria Clínica* 41(3):82-8.



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13. Yaman E, Sonmez Z (2015). Cyberbullying Trends of Adolescence. Online Journal Of Technology Addiction and Cyberbullying 2(1); 18-31.
14. Dogan F.O (2006). Video Games and Children: Violence in Video Games. New Symposium Journal 44(4); 161-164.
15. Zboralski AC, Orzechowska DE, Talarowska DE, et al.(2009) The prevalence of computer and internet addiction among pupils. Postepy Hig Med Dosw (online) 63: 8-12.
16. Yucel, N. ve Gursoy, F. The effect of internet use in adolescents' peer relations and loneliness levels. (Ed. M, Kalkan ve C, Kaygusuz) (2013). Internet Addiction Problems and Solutions. Anı Publishing: Ankara.
17. Limbos M. Casteel C. Schools and neighborhoods: Organizational and environmental factors associated with crime in secondary schools (2008). Journal of School Health, 78(10), 539-544.
18. Celen HN. Adolescence and young adulthood (2007). Papatya Publishing Education 1. edt. İstanbul,117-143.
19. Kulcu DP. Peer bullying and self-esteem in children. Master Thesis (2015). Mersin.
20. Ayas T, Piskin M.(2015) Peer bullying scale adolescent form. Akademik Bakis Dergisi. 50: 316-324.
21. Kaya AB. Development of online gaming addiction scale: Validity and reliability study (2013). Master Thesis. Tokat.
22. [Cetinkaya S](#), [Nur N](#), [Ayvaz A](#), [Özdemir D](#), [Kavakçı Ö](#). The relationship of peer bullying to the level of depression and self-esteem in three primary school students with socioeconomic status (2009). J Anatolian Psychiatry, 10(2), 151-158.
23. Oncel M, Tekin A.(2015) An Analysis on Computer Games Addiction of Secondary School Students and Their Loneliness Conditions. J Educational Science Institute. 2(4): 7-17.
24. Kelleci M, Güler N, Sezer H, Gölbaşı Z. The relationship between sex and psychiatric symptoms in high school students (2009). TAF Preventive Medicine Bulletin, 8(3), 223-230.
25. Kepenekci YK, Çınkır S. Bullying among Turkish high school students (2006). Child Abuse Negl, 30 (2),193-204.

Table 1. Sociodemographic data of study participants

	n	%
Gender		
Female	242	63.7
Male	138	36.3
Do you go to school?		
Yes	340	89.5
No	40	10.5
Do you own a mobile phone?		
Yes	370	97.4
No	10	2.6
Do you own a computer?		
Yes	328	86.3
No		
Facebook membership	209	55
Instagram membership	318	83.7
Twitter membership	116	30.5
Preferred movie type		
Comedy	206	54.2
War	109	28.7
Drama	65	17.1
Daily online game time		
<1 hour	32	9.5
2-3 hour	58	17.3
>3 hour	246	73.2
Mother education		
Illiterate	8	2.1
Literate/primary school	141	37.1
Middle school	106	27.9
High school/university	125	32.9
Father Education		
Illiterate	6	1.5
Literate/primary school	93	24.5
Middle school	110	29
High school/university	171	45

Table 2. Knowledge of families about the games their children play (number of responses= 345)

		n	%
“Does your family know which games you play?”	Yes	110	31.9
	No	235	68.1
“Does your family know whether the games you play include violence?”	Yes	127	36.8
	No	218	63.2
“Does your family interfere with how long you play?”	Yes	135	39.1
	No	210	60.9
“Does your family know which games you purchase?”	Yes	94	27.2
	No	251	72.8

Table 3. Comparison of OGAS and peer bullying scale scores with sociodemographic data

	OGAS	Peer bullying-victim	Peer bullying-bully
Gender (n=380)			
Female (n=242)	50.6±17.6	147.5 ±81.5	148.5 ±86.6
Male (n=138)	56.4 ±18.5	151.0 ±76.3	154.5 ±76.8
p	0.004	0.679	0.505
Game time (n=336)			
<1 hour (n=32)	49.3 ±17.9	216 ±66.2	223 ±62.9
2-3 hour (n=58)	52.5 ±15.2	138 ±75.7	140.9 ±79.6
>3 hour (n=246)	64.0 ±18.6	138.5 ±70.6	140.4 ±70.9
p	0.001	0.001	0.001
Computer ownership (n=380)			
Yes (n=328)	52.9 ±17.9	148.8 ±78.9	150.8 ±81.8
No (n=52)	52.3 ±19.9	148.7 ±83.9	149.4 ±91.4
p	0.821	0.994	0.909
Mother education (n=380)			
Illiterate (8)	48.7± 14.4	140.4±70.9	154.2±64.4
Literate/primary (141)	50.5 ±18.3	140.9±79.6	149.9±62.5
Middle school (106)	49.5 ±17.1	150±62.9	151.6±79.2
High sch./university (125)	57.4 ±18.06	145.6±64.7	145.7±67.3
p	0.002	0.960	0.472
Father education (n=380)			



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Illiterate (6)	46.8±13.4	142.9±68.3	157.8±64.5
Literate/primary (93)	49.3 ±18.07	146.7±81.2	152.7±72.8
Middle school (110)	50.6 ±16.5	153.4±74.4	145.9±69.4
High sch./university (171)	56.0 ±18.7	149.8±64.7	148.8±74.6
p	0.024	0.909	0.505
Movie type (n=380)			
Comedy (206)	50.5±16.2	144.8±69.5	151.4±68.7
War (109)	58.3±20.4	148.7±74.7	154.7±83.5
Drama (65)	51.2±18.3	151.5±81.6	149.7±79.4
p	0.001	0.969	0.498



The Impact Of Digital Games And Visual Media On The Defecation Habits Of The Children

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Abstract

Aim:

The children spend their spare times after school with digital games and video watching which affect their vital and social functions. The aim of this study was to determine the effect of the time spent on digital games and video watching on defecation and stool holding behavior.

Material- methods:

A questionnaire form was composed for the following characteristics of the participants; age, gender, characteristics of defecation, time spent at school in a day, presence of computer, tablet, smartphone and/or internet at home, the total time spent on digital games and/or video watching at weekdays and weekends, whether they had eating habit or stool holding behavior while spending time on digital games and/or video watching, playing motion sensitive games, spending time on digital gaming after midnight. The children 6-18 years of age were recruited to the study. Both the children and their parents were asked whether they would like to participate in a questionnaire that assessed the relationship between characteristics of defecation and the time that the children spend on digital gaming and video watching in our outpatient polyclinic. 118 subjects who agreed to participate in the survey were included in the study. The children who had a previously known bowel disease such as chronic diarrhea or constipation, or any other bowel disease such as chronic inflammatory bowel disease were excluded from the study. The body weight, height, body mass index (BMI) and BMI z-scores were recorded. Stool shape and consistency were assessed according to the Bristol stool scale.

Results:

The mean age of the 118 children (71 females, 60.2%) was 12.3 ± 3.3 years. There was no difference for age in gender. Two children (1.7%) had malnutrition, 17 (14.4%) were overweight, 25 (21.2%) were obese according to BMI z- score. The frequency of defecation was once a day in 103 (87.2%) children, every other day in 13 (11%) children, once in 3 days in 2 (1.7%) children. The stool shape and consistency was normal in 108 (91.5%) children, hard and like pebbles in 9 (7.6%) children, soft and shapeless in 1 (0.8%) child. Forty-nine (41.5%) children had stool-holding behavior at least in one of the following conditions; at school (65%), digital gaming/video watching



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(51%), social gaming (8.1%). The 64% of the children who had stool holding behavior while digital gaming/video watching weren't stool holders at other times. There was no relation between stool frequency and stool holding behavior. Of the 118 children, 103 (87.3%) had computer/tablet, 111 (94%) had smartphone at home. Out of 118 children, 103 (87.3%) were spending time on digital gaming and/or video watching at home, via computer/tablet and/or smartphone during the weekdays/weekend. Of the 103 children, 49 (47.5%) were spending time on digital gaming and/or video watching more than 2 hours on weekdays and 71 (68.9%), on weekends. The stool holding behavior wasn't related to the duration of digital gaming/video watching.

Conclusion:

Stool holding behavior is found to be common in children during digital game/video watching; 64% of children with stool-holding behavior was holding their stools only during digital game/video watching. Considering the close relationship between stool-holding behavior and constipation, the impact of the digital world is inevitable on the bowel habits.

Keywords: Digital gaming, defecation habit, stool holding behavior, children.

Introduction

Digital games and visual media have become an inevitable part of our daily life which is hard to give up or have a break. The children are spending their spare times after school on digital games and video watching which may affect their social life, mental health, sleep quality and body weight. The relation between the duration of time spent on these activities and obesity, mental health, sleep disturbances were demonstrated in previous studies (1,2).

The bowel movements differ with age, diet, lifestyle. Unhealthy lifestyle such as irregular eating and sleeping, prolonged TV viewing is found to be associated with irregular and less frequent bowel movements (3).

The aim of the study was to determine whether digital game playing and video watching effect the characteristics of defecation and stool holding behavior in children.

Material methods:

A questionnaire form was designed to determine the relationship between characteristics of defecation and the time children spend on digital gaming and video watching for the children aged 6-18 years. The age, gender, body weight and height, the body mass index (BMI) and BMI z-scores were noted. The characteristics of defecation were recorded for stool frequency (how many times in a day or how many times per week), stool shape and consistency, stool holding behavior and stool incontinence. The



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stool shape and consistency were assessed according to the Bristol stool charts by showing the stool charts to children and parents. Type 1 and 2 stools (pebblestone like defecation, lumpy sausage shaped hard stools) were accepted as hard to pass stools, type 3 and 4 stools (like a sausage, soft, smooth or have cracks on surface) were accepted ideal consistency stools, and type 5 and 6 stools (soft blobs and mushy) were accepted as diarrhea (4).

Time spent at school in a day, presence of computer, tablet, smartphone and/or internet at home, total time spent on digital games and/or video watching at weekdays and weekends, eating/ snacking habits or stool holding behavior while spending time on digital games and/or video watching, playing motion sensitive games, spending time on digital gaming after midnight, spending time on watching television at weekdays and weekends were recorded.

The children 6-18 years of age who admitted to our outpatient polyclinic were recruited to the study if they and their parents gave consent to participate in the questionnaire. The children with previously known chronic diarrhea or constipation, chronic inflammatory bowel disease, or any other bowel disease were not recruited to the study. 118 children who agreed to participate in the questionnaire were included in the study.

Statistical analyses

Statistical analyses were performed using SPSS software (ver. 17.0). Results are presented as means \pm SDs with descriptive statistics. The independent samples T-test was used as appropriate. When the variances were unequal or the distributions not normal, *the Mann-Whitney U-test* was used as appropriate.

Results:

The mean age of the 118 children was 12.3 ± 3.3 years and 71 (60.2%) were females. There was no difference for age in gender. Two children (1.7%) had malnutrition, 17 (14.4%) were overweight, 25 (21.2%) were obese according to BMI z- score.

Of 118 children, 103 (87.3%) had computer/tablet, 111 (94%) had smartphone at home. Of these 111 children, 66 (59.4%) had their own smartphones. Parents of 6 (5.4%) children didn't allow them to use any smartphone. Only 7 (5.9%) children were playing motion sensitive games at home.

The mean time spent at school was 7.8 ± 1.6 (4-12) hours. Of the 118 children, 103 (87.2%) were spending time with digital gaming and/or video watching at home, via computer/tablet and/or smartphone during the weekdays and at the weekend. The mean spending time on the digital games/video watching was 2 ± 1.6 hours on weekdays and 3.1 ± 2.3 hours on weekends. Only 13 (12.6%) children were playing online digital games. There were 13 (12.6%) children who were playing digital games instead of sleeping after midnight.



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Of the 103 children, 74 (71.8%) preferred smartphone, 20 (19.4%) preferred computer/tablet, 9 (8.7%) preferred both of them on weekdays. Of them, 66 (64%) preferred smartphone, 24 (23.3%) preferred computer/tablet, 13 (12.6%) preferred both of them on weekends.

The frequency of defecation in 118 children were; 103 (87.2%) once a day, 13 (11%) every other day, 2 (1.7%) once every 3 days. The stool shape and consistency was normal (type 3 and 4) in 108 (91.5%) children, hard, like pebbles (type 1 and 2) in 9 (7.6%) children, soft and shapeless (type 6) in 1 (0.8%) child.

Forty-nine (41.5%) children had stool holding behavior at least in one of the following conditions; at school (n: 32/118, 27.1%), digital gaming/video watching (n:25/103, 24.7%), social gaming (n:4, 3.3%). Of the 25 children who had stool holding behavior while digital gaming/video watching, 64% (n: 16 children) were stool-holding only during digital gaming/watching.

Of the 118 children, 12 had stool incontinence, all of them were stool holders. At least in one of the following conditions stool incontinence was described; at digital gaming/video watching (n:7), school (n:4), social gaming (n:3).

There wasn't any difference in hard stooling and stool holding behavior between the children who were not spending time on digital gaming/watching compared to others ($p>0.05$, $p>0.05$).

There was no difference in mean spending time on digital gaming/watching between digital stool holders and others both on weekdays and weekend. In weekdays digital stool holders were spending 2.3 ± 1.7 hours (compared to others 1.9 ± 1.5 hours, $p>0.05$), in weekends digital stool holders were spending 3.3 ± 2.5 hours (compared to others 3 ± 2.2 hours, $p>0.05$). The stool holding behavior wasn't related to online/offline gaming ($p>0.05$).

The children who were spending more than 2 hours mostly spent time on weekends (71/103 children, 68.9%) than on weekdays (49/103 children, 47.5%) ($p<0.001$). There was no difference in gender, age, BMI z-score, stool holding behavior during digital gaming/video watching between the children spending more than 2 hours on digital gaming and/or video watching.

Of the 103 children, 33 (32%) were eating meal/snacking during digital gaming/video watching. Eating meal/snacking wasn't related to age, BMI z-scores, mean maximum spending time on digital gaming/video watching.

Out of 118 children, 22 (18.6%) on weekdays and 27 (22.8%) in weekends were not watching television. Overall, the median time of watching television was 1 hour/day (30 minutes - 6 hours) during the weekdays, and 2 hours/day (30 minutes - 8 hours) during the weekends. 35/103 (34%) and 34/103 (33%) of children both watching television



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and spending more than 2 hours with digital gaming/ video watching on weekdays and weekends, respectively.

Discussion:

The bowel movements are affected by lifestyle changes and diet. Constipation is a common gastrointestinal problem in childhood with a mean prevalence of 14%. Childhood constipation is mostly functional (5). In children, the most common mechanism for functional constipation is stool holding behavior. In young children it usually begins after a painful defecation, in older children it is related to insufficient time for a proper bowel movement, due to the active school life. While the stool remains in the rectum, the water of the stool is absorbed by the rectal mucosa and hardened, and it becomes difficult to pass. The hard stool causes a painful defecation, which causes subsequent delaying of defecation voluntarily, so a vicious cycle takes place. Over time, due to a chronic stool loading, soiling may be seen (4,5).

The school-aged children may delay defecation due to various reasons; reject to go the toilet in school time, not to interrupt their social games etc. Also it is hard to give up while digital gaming/watching video, it is like an addiction. Digital gaming may be related to delay in social events, sleeping disturbances (6,7), lower physical activities (8,9). In older children (age range 10-18 years), the physical activity time was reported to be significantly low in who were constipated (10).

The American Academy of Pediatrics reported that >2 hours/day media use is associated with increased risk of being overweight (2). In this study, the relation between media usage (digital gaming and/or video watching time more than 2 hours/day) and bowel movements was evaluated, but no significant relation was found. On the other hand, digital stool holders were spending a little more time on gaming/watching especially on weekdays than others.

In this study, most of the children had a normal stooling pattern. The stool holding behavior was mostly seen at school time, secondly during digital gaming/video watching. Of the digital stool holders, 64% had stool holding behavior only during digital gaming/watching, but not in any other situation.

The major limitation of the study is the fact that due to being a patient statement based study, the time spend on gaming/watching may be exaggerated or diminished.

Conclusion:

The majority of children (64%) who were stool holders during digital gaming/video watching did not hold their stools at other times. Considering the close relationship



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between stool holding behavior and constipation, the effect of the digital world on bowel habits seems to be inevitable.

References

- 1) AAP Council On Communications and Media. (2016). Media Use in School-Aged Children and Adolescents. *Pediatrics*, 138(5), e20162592.
- 2) Reid Chassiakos, Y. L., Radesky, J., Christakis, D., Moreno, M. A., Cross, C., ve Council On Communications and Media. (2016). Children and Adolescents and Digital Media. *Pediatrics*, 138(5), 2016-2593
- 3) Yamada, M., Sekine, M., ve Tatsuse, T. (2017). Lifestyle and bowel movements in school children: Results from the Toyama Birth Cohort Study. *Pediatr Int*, 59(5), 604-613
- 4) Waterham, M., Kaufman, J., ve Gibb, S. (2017). Childhood constipation. *Aust Fam Physician*, 46(12), 908-912.
- 5) Vandenplas, Y., ve Devreker, T. (2018). Functional constipation in children. *J Pediatr (Rio J)*. doi:10.1016/j.jpmed.2018.02.005
- 6) Bruni, O., Sette, S., Fontanesi, L., Baiocco, R., Laghi, F., ve Baumgartner, E. (2015). Technology Use and Sleep Quality in Preadolescence and Adolescence. *J Clin Sleep Med*, 11(12), 1433-1441.
- 7) Cespedes, E. M., Gillman, M. W., Kleinman, K., Rifas-Shiman, S. L., Redline, S., ve Taveras, E. M. (2014). Television viewing, bedroom television, and sleep duration from infancy to mid-childhood. *Pediatrics*, 133(5), e1163-1171.
- 8) Ramsey Buchanan, L., Rooks-Peck, C. R., Finnie, R. K. C., Wethington, H. R., Jacob, V., Fulton, J. E., Johnson, D. B., Kahwati, L. C., Pratt, C. A., Ramirez, G., Mercer, S. L., Glanz, K. ve Community Preventive Services Task, F. (2016). Reducing Recreational Sedentary Screen Time: A Community Guide Systematic Review. *Am J Prev Med*, 50(3), 402-415.
- 9) Chow, R. (2017). Decreasing screen time and/or increasing exercise only helps in certain situations for young adults. *Int J Adolesc Med Health*. doi: 10.1515/ijamh-2017-0100.
- 10) Seidenfaden, S., Ormarsson, O. T., Lund, S. H., ve Bjornsson, E. S. (2018). Physical activity may decrease the likelihood of children developing constipation. *Acta Paediatr*, 107(1), 151-155.

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Evaluation of The Relationship Between Digital Games Involving Violence and Negative Perception Effects on Adolescents

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Abstract:

Aim:

Information and communication technologies represent as essential components of current daily life. Utilization of digital (video) games is steadily increasing especially amongst adolescents and young adults. Despite many positive effects of digital gaming, digital game addiction and digital games with violent content have been associated with many detrimental effects. Primary aim of this study is evaluation of the relationship between digital games involving violence and perception of violence on adolescents. Secondary aim is assigned as comparison of feeling of discomfort caused by photograph and digital game images involving violence.

Methods:

Adolescents, aged 15-18 years, who admitted to the pediatric outpatient clinic of Ankara University Children’s Hospital, were requested to fill a survey instrument questioning sociodemographic characteristics, use of internet and digital gaming. Evaluation of violent content of digital games was based on a digital game content rating system called PEGI (Pan European Game Information). Participants were shown 6 digital game and 4 photograph images comprising violence; along with 3 non-violent digital game and 3 photograph images. They were asked to remark the degree of discomfort created by each image on themselves (1-5). Participants were divided into three groups: Group 1 (non-digital gamers), Group 2 (digital gamers), Group 3 (digital gamers including violent content). Comparison of the mean discomfort scores of violent and non-violent images and photos was made for each participant. Mean discomfort scores created by video game and photograph images involving violence were compared between groups. In addition, discomfort scores created by violent content were compared between digital game images and photographic images for each group.

Results:

A total of 53 adolescents with a mean age of 16.43 ± 1.42 years [31 (58.5%) female, 22 (41.5%) male]] were included to the preliminary data of this pilot study. 15 participants (28.3%) signified no digital gaming (Group 1). The number of participants declaring digital gaming not involving violence (Group 2) was 19 (35.8%) and 19 (35.8%) participants reported that they played dijital games involving violence (Group 3). When the whole group was taken into account, mean discomfort score was higher for violent images (5.67 ± 1.89) when compared with non-violent images (2.40 ± 0.54) ($p < 0.001$).



Mean discomfort score evoked by violent content indicated similar results for Group 1 and Group 2 ($p=0.825$) while Group 2 indicated higher scores in comparison with Group 3 ($p<0.001$). Mean discomfort score of Group 3 considering violent photos was higher than violent digital game images ($p<0.001$). Group 1 and Group 2 were noticed to have similar discomfort scores as regards of both photos ($p=0.646$) and digital game images involving violence ($p=0.427$). Moreover, Group 2 appeared to have higher discomfort scores for both violent photo ($p<0.001$) and digital game ($p<0.001$) images when compared with Group 3.

Conclusions:

Preliminary data of this ongoing study indicate that digital games involving violent content may effect adolescents in terms of decreased sensitivity to violence perception. It must be considered that these effects may also relate to real life violence. We think that increasing the sample size of this pilot study will provide much more reliable data. We also believe that increasing number of well-designed preventive studies on this issue of concern should be conducted in the future.

Key words: adolescents, digital gaming, violent content, insensitivity to violence

Introduction

Digital gaming is an increasingly popular activity among adolescents and young adults. Current data from the United States of America indicate that more than 90% of children and adolescents play video games (1,2). The prevalence of digital game addiction varies between 1% and 9%, depending on the region, size and mean age of the samples (3).

Hundreds of studies evaluating the effects of digital games have been conducted. Digital gaming carries many positive benefits such as providing an opportunity to relax and have fun, reduction of daily stress and improvement of problem dealing, self-confidence, visual attention and motor skills (4,5). Educational digital games increase attention, motivation and expedite learning (6). Evidence suggest that digital games involving prosocial elements decrease aggressive thinking and behavior, and increase sharing and empathy (7,8). Furthermore, exercise gaming which is performed using gaming consoles is known to increase daily exercise time (9).

On the other hand, digital games with violent content have been associated with many detrimental psychosocial and behavioral effects such as feeling of loneliness, depression, attention deficit, aggressive behavior, anxiety, violent tendency, lack of empathy and decreased positive social behaviors (10-15).

Primary aim of this study was to evaluate the relationship between digital games involving violence and perception of violence on adolescents. Secondary aim was assigned as interpretation of real life perception of violence in adolescents by



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comparison of feeling of discomfort caused by violent photograph and digital game images. We believe that data obtained from this study will enable objective demonstration of negative effects of violent video games on children and adolescents from the perspective of sensitivity to violence and provide a basis for preventive research on this issue.

Materials and Methods:

Adolescents, aged 15-18 years, who admitted to the pediatric outpatient clinic of Ankara University Children’s Hospital were requested to fill a survey instrument questioning sociodemographic characteristics, use of internet and digital gaming. Adolescents previously diagnosed with any psychiatric condition (eg. anxiety, psychosis, mood disorder), developmental delay, neuromuscular disorder and/or refusing to participate were excluded. Evaluation of violent content of digital games was based on a digital game content rating system called PEGI (Pan European Game Information) (16). Special attention was focused on the total amount of time spent on playing video games per day and records of specific video game names denoted by the participants. Identity information of the participants were not questioned. Participants were informed that it took approximately 20 minutes to fill the required forms.

Participants were also asked to fill the Turkish version of the “digital game addiction scale (DGAS-7) (17). This scale was developed by Lemmens et al to evaluate problematic gaming behavior of children and adolescents aged between 12 and 18 years (18). The original DGAS-7 was determined to have high validity and reliability, therefore shown to be usable for adolescents. This is a 5-item (1=never, 5= always) Likert type, single-dimension scale consisting of seven questions (interval: 7-35). Polythetic diagnosis of internet addiction based on this scale is defined as at least 3 scores from a minimum of 4 out of 7 existing questions.

Following the completion of the survey instrument, participants were shown 6 digital game and 4 photograph images comprising violence; along with 3 non-violent digital game and 3 photograph images. Violent and non-violent digital game images were chosen according to PEGI rating while the photograph images were picked from the International Affective Picture System (IAPS) (19). This is a system which is developed to provide a set of normative emotional stimuli for experimental investigations of emotion and attention. They were asked to remark the degree of discomfort created by each image on themselves using a 5-item Likert scale (1: not at all, 2: very little, 3: some, 4: quite, 5: too much discomfort).

Participants were divided into three groups based on the survey results: Group 1 (non-digital gamers), Group 2 (digital gamers), Group 3 (digital gamers including violent content). Comparison of the mean discomfort scores of violent and non-violent images and photos was made for each participant. The mean discomfort scores created by video game and photograph images involving violence were compared between groups. In addition, discomfort scores created by violent content were compared between digital game images and photographic images for each group.



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Statistical analysis: Statistical analysis of this study was performed using the SPSS statistical package (v.21.0). Number (n) and percentages (%) were used for categorical variables. For continuous variables, mean \pm SD was used in case of normal distribution while median (minimum-maximum) values were given for non-normally distributed variables. Chi Square test/Fisher’s Exact test were used for comparison of categorical variables, where applicable. For continuous variables involving two groups, student’s t test or Mann-Whitney U test were used. $P < 0.05$ was considered statistically significant.

Results:

A total of 53 adolescents with a mean age of 16.43 ± 1.42 years [31 (58.5%) female, 22 (41.5%) male] were included to the preliminary data of this pilot study. 15 participants (28.3%) signified no digital gaming (Group 1). The number of participants declaring digital gaming not involving violence (Group 2) was 19 (35.8%) and 19 (35.8%) participants reported that they played digital games involving violence (Group 3). Of all, twenty adolescents (37.7%) expressed that they played digital games at least three times a week. Seventeen participants (32%) signified spending more than 2 hours a day on playing digital games.

When the whole group was taken into account, mean discomfort score was higher for violent images (5.67 ± 1.89) when compared with non-violent images (2.40 ± 0.54). This comparison reflected statistical significance ($p < 0.001$). Mean discomfort score evoked by violent content indicated similar results for Group 1 (6.44 ± 2.24) and Group 2 (6.29 ± 1.55) ($p = 0.825$) while Group 2 indicated statistically significant higher scores in comparison with Group 3 (4.44 ± 1.24) ($p < 0.001$) (Table 1,2).

Mean discomfort score of Group 3 considering violent photos (2.74 ± 0.89) was higher than violent digital game images (1.70 ± 0.55) ($p < 0.001$) (Table 3). Group 1 and Group 2 were noticed to have similar discomfort scores as regards of both photos ($p = 0.646$) and digital game images involving violence ($p = 0.427$) (Table 4). Moreover, Group 2 appeared to have higher discomfort scores for both violent photo ($p < 0.001$) and digital game ($p < 0.001$) images when compared with Group 3 (Table 5).

Discussion:

Digital gaming is an increasingly preferred activity of people of all ages, especially adolescents and youth. As a natural course, this fact has led to significant public concern about negative outcomes which are more likely to occur in case of “game addiction” and exposure to “violent content”. Hundreds of studies including questionnaires, case scenarios and even brain activity assessments have been conducted to evaluate detrimental effects of exposure to digital games involving violent content (10-15,20). Indeed, this is an ever-growing area of research. Anderson et al published a meta-analysis which has evaluated many effects of violent video games, including many studies analyzing a total of 130,000 participants (12). The authors observed increased risk of aggressive thoughts and behaviors along with decreased empathic feelings in exposed individuals.



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One of these effects which is emphasized by some researchers is “desensitization to violence”. More importantly, desensitization to violent media has been associated with increased aggressive behavior in real life (21). Studies show that repeated exposure to violent digital media result in reduced aggressive inhibition and reduced empathy for the pain and suffering of others (22,23). We concluded similar results with previous studies, suggesting desensitization to violence in adolescents playing digital games with violent content. Moreover, we compared discomfort scores adolescents gave to violent photos and digital game images involving violence, and encountered higher discomfort scores in response to violent photos. As far as we searched the literature, we could not find any study which carried out a similar comparison. The same difference was not observed in adolescents who did not play digital games at all, or did not prefer violent digital games despite being digital gamers. Nevertheless, we believe that this finding does not necessarily indicate that exposure to violent content is not associated with increased aggressive behavior in life. Measuring each participant’s reaction to a case scenario including violent content would have enabled better assessment of violence perception.

Conclusions:

Preliminary data of this ongoing study indicate that digital games involving violent content may effect adolescents in terms of decreased sensitivity to violence perception. It must be considered that these effects may also relate to real life violence. We think that increasing the sample size of this pilot study will provide much more reliable data. We suggest dissemination of curriculums for students, parents and teachers regarding media literacy, software and coding lessons, in addition to a compulsory internationally accepted digital rating system for digital games regarding content and age for our country, Turkey. More importantly, we believe that increasing number of well-designed preventive studies on this issue should be conducted in the future.

References:

1. The NPD Group (2011) The video game industry is adding 2–17-year old gamers at a rate higher than that age group’s population growth. Available at: <http://www.afjv.com/news/233-kids-and-gaming-2011.htm>. Accessed September 12, 2017
2. Rideout VJ, Foehr UG, Roberts DF (2013) Generation M2: Media in the lives of 8- to 18-year-olds. Available at: <https://kaiserfamilyfoundation.files.wordpress.com/2013/04/8010.pdf>. Accessed July 20, 2017.
3. Gentile DA, Bailey K, Bavelier D, Brockmyer JF, Cash H, Coyne SM, Doan A, Grant DS, Green CS, Griffiths M, Markle T, Petry NM, Prot S, Rae CD, Rehbein F, Rich M, Sullivan D, Woolley E, Young K. Internet Gaming Disorder in Children and Adolescents (2017) *Pediatrics* 140(2):S81-S85. doi: 10.1542/peds.2016-1758H.
4. Green CS, Bavelier D. Action video game modifies visual selective attention (2003)*Nature* 29;423(6939):534-7.



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5. Griffiths MD, Davies, MNO (2005) Videogame addiction: Does It Exist? Handbook of Computer Game Studies. J. Goldstein, J. Raessens (Eds), Boston MIT Press,3.359-68.
6. Prot S, Anderson CA, Gentile DA et al (2014) The Positive And Negative Effects Of Video Game Play. Children And Media. A. Jordan, D. Romer (Eds) New York. Oxford University Press.109-28.
7. Greitemeyer T, Osswald S (2010) Effects of prosocial video games on prosocial behavior. J Pers Soc Psychol 98:211-21.
8. Gentile DA, Gentile JR (2008) Video games as exemplary teachers: A conceptual analysis. J Youth Adolesc 37:127-41.
9. Biddiss E, Irwin J (2010) Active video games to promote physical activity in children and youth. Arch Pediatr Adolesc Med 164:664-72.
10. Wack E, Tantleff-Dunn S (2009) Relationships between electronic game play, obesity, and psychosocial functioning in young men. Cyberpsychol Behav 12:241-4.
11. Aylin Yalçın Irmak, Semra Erdoğan. Digital Game Addiction Among Adolescents and Young Adults: A Current Overview. Turkish Journal of Psychiatry 2016;27(2):0.
12. Anderson CA, Shibuya A, Ihori N et al. Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: A meta-analytic review. Psychol Bull 2010; 136:151-73.
13. Mentzoni RA, Brunborg GS, Molde H et al (2011) Problematic video game use: Estimated prevalence and associations with mental and physical health. Cyberpsychol Behav Soc Netw 14:591–6.
14. Williams D, Kennedy TLM, Moore RJ (2011) Behind the avatar: The patterns, practices, and functions of role playing in MMOs. Games and Culture 6:171-200.
15. Greitemeyer T, Müge DO (2014) Video games do affect social outcomes: A meta-analytic review of the effects of violent and prosocial video game play. Pers Soc Psychol Bull 40:578–89.
16. Pan European Game Information (PEGI). [Accessed at: https://pegi.info/](https://pegi.info/)
17. Aylin Yalçın Irmak, Semra Erdoğan (2015) Dijital Oyun Bağımlılığı Ölçeği Türkçe formunun geçerliliği ve güvenilirliği. Anatolian Journal of Psychiatry; 16(1):10-18
18. Lemmens JS, Valkenburg PM, Peter J. (2009) Development and validation of a game addiction scale for adolescents. Media Psychology; 12(1):77-95.
19. International Affective Picture System (IAPS), University of Florida. Accessed at: <http://csea.php.ufl.edu/media.html>
20. Engelhardt CR, Bartholow BD, Kerr KT, Bushman BJ (2011) This is your brain on violent video games: Neural desensitization to violence predicts increased aggression following violent video game exposure. Journal of Experimental Social Psychology 47(5):1033-1036.
21. Smith SL, Donnerstein E (1998). Harmful effects of exposure to media violence: Learning of aggression, emotional desensitization, and fear. In R.G.Geen and Donnerstein (Eds.), Human aggression: Theories, research and implications for social policy (pp.167-202). San Diego, CA: Academic Press.

22. Huesmann LR, [Moise-Titus J](#), [Podolski CL](#), [Eron LD](#) (2003) Dev Psychol.;39(2):201- Longitudinal relations between children's exposure to TV violence and their aggressive and violent behavior in young adulthood: 1977-1992.
23. Mullin CR, Linz D (1995) J Pers Soc Psychol.;69(3):449-59. Desensitization and resensitization to violence against women: effects of exposure to sexually violent films on judgments of domestic violence victims.

TABLES:

Table 1: Comparison of Group 1 and Group 2 considering discomfort scores following observation of violent images

	Group 1 (n=15)	Group 2 (n=19)	p value
Discomfort score (mean±SD)	6,44 ± 2,24	6,29 ± 1,55	0,825

Table 2: Comparison of Group 2 and Group 3 considering discomfort scores following observation of violent images

	Group 2 (n=19)	Group 3 (n=19)	p value
Discomfort score (mean±SD)	6,29 ± 1,55	4,44 ± 1,24	<0,001

Table 3: Comparison of Group 3's discomfort scores of photograph and digital game images involving violence

	Photograph	Digital game	p value
Discomfort score (mean±SD)	2,74 ± 0,89	1,70 ± 0,55	< 0,001

Table 4: Comparison of Group 1 and Group 2 considering discomfort scores of photograph and digital game images involving violence (mean±SD)

	Group 1	Group 2	p value
Photograph	3,52 ± 1,09	3,67 ± 0,85	0,646
Digital game	2,92 ± 1,20	2,62 ± 0,97	0,427

Table 5: Comparison of Group 2 and Group 3 considering discomfort scores of photograph and digital game images involving violence (mean±SD)

	Group 2	Group 3	p value
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Photograph	$3,67 \pm 0,85$	$2,74 \pm 0,89$	0,001
Digital game	$2,62 \pm 0,97$	$1,70 \pm 0,55$	0,001



Technological Device Usage Habits and Participation in Physical Activity of School Age Children

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Abstract

Research has shown that children use technology devices at least as much as adult individuals. Evidence that the use of technological devices has altered physical activity is inadequate, but the level of participation in physical activity decreases as children increase sedentary behaviors. In literature, it is reported that 37% of children aged 4-11 years have a low level of active playing (football, basketball, etc.) and 65% have a high screening time (television, computer, tablet, etc.). In a study on children aged 6-17 years, it was determined that those who have low physical activity level and those who use long time technological devices are two times more likely to be obese. In our country, it is seen that there are a limited number of studies investigating the effects of school children on technological device usage habits and physical activity. For this reason, the purpose of our study was to examine the habits of technological device use by school age children (6-12 years) and their participation in physical activity. The study was conducted between January 15 - March 4, 2018 based on the views of 112 parents aged 6-12 years. A questionnaire prepared by the researchers was used to ask parents about the length of time their children spent on technological devices, their frequency, and their participation in physical activity. It was determined that the usage time of technological devices (television, computer, mobile phone, etc.) during the day was 164.3 ± 112.6 minutes. It was found that television viewing time 66.8 ± 57.5 minutes, 32.9 ± 47.6 minutes of telephone useage time, 29.9 ± 55.6 minutes of computer useage time, 27.5 ± 41.5 minutes of tablet usage time, the playing time with the game console was 6.1 ± 15.9 minutes. When the frequency of use of technological devices by the children is examined, the rate of more than one time in a day watching TVs is 48,2%, 33.0% of telephone users, 20.5% of tablet users and and 15.2% for computer users. When children's purposes of using technological devices were examined, 76.2% of the television viewers were watching the TV for cartoon film, 51.5% of computer users for education reason and 48.3% of students play games, 50.1% of telephone users play games and 34.0% for communication, 71.6% of the users of tablets play games and 32.4% of them use tablets for education. When the participation of children participating in the study is examined in the physical activity, this age group is 42.8% of children meeting guidelines for participation in moderate physical activity for at least 5 days/1 hour or more per week in the guidelines for children, and 19.2% of children did not spend any time in parks or playgrounds outside school. However, when we examined the incidence of high intensity physical activities such as football and



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basketball, it was found that 29.8% of the children complied with the guidelines stated in the guidelines and 16.1% of those who never participated in high intensity physical activities. The duration of participation of children in high intensity physical activity was 46.5 ± 39.1 minutes. According to the findings obtained during the study, it was seen that children aged 6-12 years used more than 2,5 hours of technological devices during the day. It was determined that the children spent the most time during the day and that the most frequently used technological devices were televisions and telephones, respectively. According to parents, children use television to watch cartoons, computer to education, phone and tablet to play games. It has been determined that six out of every ten children participating in the study do not comply with the recommendation that children in this age group should participate in moderate or severe physical activity for at least 5 days /1 hour or more per week as indicated in the guidelines. Parents should strive to ensure that children are able to participate in adequate physical activity for their healthy growth and development by making plans according to their age and level of development.

Key words: technological device usage, physical activity, television, child, mobile phone

Introduction

Children's homes are packed with technological device options, including television (TV), computers, DVD players and video game consoles. Nearly all children (99%) live in a home with a TV set, half (50%) have three or more TVs, and one-third (36%) have a TV in their bedroom. Nearly three out of four (73%) have a computer at home, and about half (49%) have a video game player. Nearly all of them (97%) have products clothes, toys, and the like based on characters from TV shows or movies (Rideout, Vandewater, & Wartella, 2003).

Physical activity and sedentary behaviors in children are associated with overall physical, psychological, and psychosocial wellbeing. Children who are physically active have a lower adiposity, more favorable lipid profiles, and increased cognitive function compared with their inactive counterparts. Independent of moderate-to-vigorous physical activity, sedentary behaviors, such as watching TV, playing video games, and using a computer, have been associated with being overweight and obese and having higher serum cholesterol levels, blood pressure, and glycohemoglobin levels. Importantly, physical activity and sedentary behaviors track from childhood to adulthood (Fakhouri, Hughes, Brody, Kit, & Ogden, 2013; Telama, 2009). Participation in large amounts of sedentary, or sitting, behaviors is associated with multiple health problems such as impaired lipid profiles and glucose uptake, greater energy intake and waist circumferences, and greater mortality risk. Participation in large amounts of sedentary behavior has negative health consequences, may interfere with physical



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activity behavior, and could contribute to suppressed cardiorespiratory fitness (Lepp, Barkley, Sanders, Rebold, & Gates, 2013).

Technological advancement has led to a dramatic increase in the time children spend in sedentary screen-based activities, such as watching television, playing video games, and using computers. These screen-based activities are thought to displace active behaviors and have been independently associated with obesity. Television watching is also thought to increase exposure to food advertisements and consumption of energy dense snack foods. Screen-time accounts for the largest proportion of children’s sedentary time (Foley & Maddison, 2010). However, little is known about adherence to physical activity and screen-time recommendations among our country children. The purpose of our study was to examine the habits of technological device use by school age children (6-12 years) and their participation in physical activity.

Methods

The survey was conducted between January 15 - March 4, 2018, based on the views of 112 parents aged 6-12 years. Online questionnaire software (Google Documents) was utilised to design the online survey and to collect data. This was consistent with the methodology of previous research. The online survey firstly asked basic demographic questions such as age, gender and occupation. In the questionnaire prepared by the researchers, the parents were asked about the length of time their children spent on technological devices, their frequency, and their participation in physical activity. The data obtained in the study were analyzed using SPSS 20.0 (Statistical Package for the Social Sciences) statistical package program. In the evaluation, descriptive statistics methods such as mean, standard deviation and frequency distribution were used.

Results

It was determined that the usage time of technological devices (television, computer, mobile phone, etc.) during the day was 164.3 ± 112.6 minutes. It was found that television viewing time 66.8 ± 57.5 minutes, 32.9 ± 47.6 minutes of telephone usage time, 29.9 ± 55.6 minutes of computer usage time, 27.5 ± 41.5 minutes of tablet usage time, the playing time with the game console was 6.1 ± 15.9 minutes. When the frequency of use of technological devices by the children is examined, the rate of more than one time in a day watching TVs is 48,2%, 33.0% of telephone users, 20.5% of tablet users and and 15.2% for computer users. When children's purposes of using technological devices were examined, 76.2% of the television viewers were watching the TV for cartoon film, 51.5% of computer users for education reason and 48.3% of students play games, 50.1% of telephone users play games and 34.0% for communication, 71.6% of the users of tablets play games and 32.4% of them use tablets for education. When the participation of children participating in the study is examined in the physical activity, this age group is 42.8% of children meeting guidelines for



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participation in moderate physical activity for at least 5 days/1 hour or more per week in the guidelines for children, and 19.2% of children did not spend any time in parks or playgrounds outside school. However, when we examined the incidence of high intensity physical activities such as football and basketball, it was found that 29.8% of the children complied with the guidelines stated in the guidelines and 16.1% of those who never participated in high intensity physical activities. The duration of participation of children in high intensity physical activity was 46.5 ± 39.1 minutes.

Discussion

Many studies have been conducted to create a correlation between time spent by children to their body mass index (BMI). A study which studied the associations between physical activity, screen time and weight from 6 to 14 years. Based on the study it can be concluded that most unhealthy characteristics are established in early childhood which means that physical activity, screen time and weight status of a child at age 6 can predict the outcome at 14 (Hands et al., 2011). In another study, authors claims that, fewer than 4 in 10 children met both physical activity and screen-time recommendations concurrently. The prevalence of sedentary behavior was higher in older children. Low levels of screen-time viewing may not necessarily predict higher levels of physical activity (Fakhouri et al., 2013). Cox et al. 2012, reported that pre-school children had a decrease in physical activity levels and a significant increase in BMI levels (Cox, Skouteris, Rutherford, Fuller-Tyszkiewicz, & Hardy, 2012). In a study of children aged 6-17 years, those with low physical activity and using long-term technological devices (television or video watching and playing computer games) were found to be twice as likely to be obese (Sisson, Broyles, Baker, & Katzmarzyk, 2010). Television monitoring has been reported as a typical sedentary activity and it has been suggested that the increase in monitoring duration is associated with decreased physical activity in children (Sandercock, Ogunleye, & Voss, 2012).

Conclusions

According to the findings obtained during the study, it was seen that children aged 6-12 years used more than 2,5 hours of technological devices during the day. It was determined that the children spent the most time during the day and that the most frequently used technological devices were televisions and telephones, respectively. According to parents, children use television to watch cartoons, computer to education, phone and tablet to play games. It has been determined that six out of every ten children participating in the study do not comply with the recommendation that children in this age group should participate in moderate or severe physical activity for at least 5 days /1 hour or more per week as indicated in the guidelines. Parents should strive to ensure that children are able to participate in adequate physical activity for their healthy growth and development by making plans according to their age and level of development.



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References

- Cox, R., Skouteris, H., Rutherford, L., Fuller-Tyszkiewicz, M., & Hardy, L. L. (2012). Television viewing, television content, food intake, physical activity and body mass index: a cross-sectional study of preschool children aged 2-6 years. *Health Promotion Journal of Australia*, 23(1), 58-62.
- Fakhouri, T. H., Hughes, J. P., Brody, D. J., Kit, B. K., & Ogden, C. L. (2013). Physical activity and screen-time viewing among elementary school-aged children in the United States from 2009 to 2010. *JAMA pediatrics*, 167(3), 223-229.
- Foley, L., & Maddison, R. (2010). Use of active video games to increase physical activity in children: a (virtual) reality? *Pediatric exercise science*, 22(1), 7-20.
- Hands, B. P., Chivers, P. T., Parker, H. E., Beilin, L., Kendall, G., & Larkin, D. (2011). The associations between physical activity, screen time and weight from 6 to 14 yrs: the Raine Study. *Journal of Science and Medicine in Sport*, 14(5), 397-403.
- Lepp, A., Barkley, J. E., Sanders, G. J., Rebold, M., & Gates, P. (2013). The relationship between cell phone use, physical and sedentary activity, and cardiorespiratory fitness in a sample of US college students. *International Journal of Behavioral Nutrition and Physical Activity*, 10(1), 79.
- Rideout, V. J., Vandewater, E. A., & Wartella, E. A. (2003). Zero to six: Electronic media in the lives of infants, toddlers and preschoolers.
- Sandercock, G. R., Ogunleye, A., & Voss, C. (2012). Screen time and physical activity in youth: thief of time or lifestyle choice? *Journal of Physical Activity and Health*, 9(7), 977-984.
- Sisson, S. B., Broyles, S. T., Baker, B. L., & Katzmarzyk, P. T. (2010). Screen time, physical activity, and overweight in US youth: National Survey of Children's Health 2003. *Journal of Adolescent Health*, 47(3), 309-311.
- Telama, R. (2009). Tracking of physical activity from childhood to adulthood: a review. *Obesity facts*, 2(3), 187-195.



Examination of Relation between High School Students' Online Game Addiction, Loneliness, Aggression and Depression Tendency

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Abstract: Playing online games is one of the most popular Internet activities of our time. With the widespread use of the Internet, interest in online games has also increased. While it is formerly mostly limited to game centers, online gaming habits can now be maintained at any time of day thanks to the smartphones. One of the reasons why interest in online games increased is online games of nowadays render the possibility of playing with multi-player. Apart from online game playing, this interest also proceeds on virtual social groups through social network activities such as sharing videos of games they play, discussion of them, learning new strategies. Although online games have cognitive, emotional, motivational and social benefits, they also lead to undesirable situations like game addiction. Therefore, it should be taken into account that online game addiction can bring about many physical, mental and psychological problems. In the researches carried out, online game addiction leads excessive anxiety, intolerance, hasty behavior, anger, mood swings, and behavioral changes. For this reason, determining the factors associated with online gaming addiction may be a guide to preventing addiction. The aim of this research is to examine the online game addiction status of high school students and to examine the relationship of online game addiction and feeling of loneliness, aggression and depression tendencies. The research was carried out according to the correlational research model and was conducted on the students of an Anatolian High School located in a province center in the Western Black Sea Region. Participants of this study consist of 276 high school students. Data of study; Online Game Addiction Scale that is to determine addiction status of high school students, the UCLA Loneliness Scale that is to determine students' loneliness status, BUSS-PERRY Aggression Scale that is to determine students' aggression tendencies, BECK Depression Scale that is to determine students' depression tendencies. It has been questioned whether the data obtained within the scope of the study can meet the normal assumptions; as a result it has been seen data is normally distributed. Findings from the researches are; there is a low positive significant correlation ($r = .26$; $p < .01$) between high school students' online game addiction and their feeling loneliness, there is a moderately positive significant correlation ($r = .44$; $p < .01$) between online game addiction and aggression tendencies, there is a low positive significant correlation ($r =$



.28; $p < .01$) between online game addiction and depression tendencies. When the relations of other scales are examined; it has been seen, there is a moderately positive significant correlation between feeling loneliness and aggression tendencies ($r = .47$; $p < .01$), there is a low significant positive correlation between depressive tendencies and feelings of loneliness ($r = .15$; $p < .01$), there is moderately positive significant relation between depression tendency and aggression tendency ($r = .34$; $p < .01$). According to findings obtained from the research, due to the increase of online gaming addiction it can be said, students' feeling loneliness increased a bit, their aggression behaviour increased and depression tendency an increased a bit. In reducing online game addiction; taking preventative measures can be taken to decrease online game playing addiction and to reduce addicted user's feelings of loneliness, their tendency to engage in depression and aggression tendencies. It was discussed what can be done in order to decrease the game addiction of the students in the direction of the findings obtained from the research. Various suggestions have been given to teachers, parents and policy makers.

Keywords: High school students, Online game addiction, Loneliness, Aggression, Depression

Introduction

In the 21st century, digital tools are used in many areas such as e-commerce, e-health applications as well as the use of educational teaching processes. Along with the many benefits provided by these tools, it also brings together many risk factors, especially addiction. Some of these are problematic internet use, telephone addiction and game addiction (Karaoglan Yilmaz, Yilmaz, Teker, & Keser, 2014). Karaoglan Yilmaz, Dilen and Durmuş (2018) determined that 88.7% of high school students had internet access. This indicates that students are open to many risks on mobile and online. One of these risks is related to digital gaming addiction. Digital game addiction is a situation where an individual cannot stop playing the game for a long time, relate the game to his real life, do not carry out his responsibilities due to the games, and prefer it to other daily activities (Eni, 2017). In the game addiction process; depending on the increase of the pleasure, the more pleasure is got as the game played, more game is played as the pleasure is got. Therefore computer game addiction emerges as a result (Horzum, Ayas, & Çakır Balta, 2008). In this context, Horzum (2011) lists the results the addiction of game not to leave game, think it constantly, relate it to real life, leave his task responsibilities away, prefer playing games to other daily activities. When the literature is viewed, it is stated that game addiction can lead to many physical and psychological negative effects on individuals, especially adolescents (Kaplan, 2017; Kaya, 2013). For this reason, it is important to determine the factors that causing game addiction in adolescents in order to determine the measures that should be taken to struggle addiction.

In this context, in this study it is aimed to examine the online gaming addiction status of high school students and to examine the relationship of online game addiction and



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feeling loneliness, aggression and depression tendencies. For this aim, the following questions were sought:

- What is status of high school students' online game addiction?
- Is there a statistically significant correlation between high school students' online game addiction and their feeling loneliness?
- Is there a statistically significant correlation between high school students' online game addiction and aggression tendencies?
- Is there a statistically significant correlation between high school students' online gaming addiction and depression tendencies?

Method

In this part of the study, it's given the model of the researcher, the data collection tools, the analysis of the data and the interpretation of the data.

Research Model

In this study, it was utilized from correlational research to examine the online game addiction status of high school students and to examine the relationship of online game addiction and loneliness and depression tendencies. Correlational research is the study of the correlation between two or more variations in any way without interfering with these variations (Büyüköztürk et al., 2008). This study was conducted on Anatolian High School students in a province center in Western Black Sea Region during the spring semester of 2016/2017 academic year.

Data Collection Tools

Data of research; Online Game Addition Scale that is used to determine high school students' online game addition status, UCLA Loneliness Scale to determine loneliness status, BUSS-PERRY Aggression Scale to determine aggression tendency status of students, BECK Depression Scale to determine status of depression tendency. The online game addiction scale, developed by Kaya (2013), consists of 21 items in five-point likert type. The UCLA Loneliness Scale is adapted to Turkish by Demir (1989) and consists of 20 items of the four-point likert type. The Buss-Perry Aggression Scale is adapted to Turkish by Madran (2012) and consists of 29 items of the five-point Likert type. The Beck Depression Tendency Scale was adapted to Turkish by Hisli (1989) and consists of 21 items of the four-point likert type.

Analysis of Data

It has been examined whether data obtained in the study meet the normal assumptions or not and it has been determined it is between -1 and +1 of Skewness and Kurtosis values. In this case it has been determined that the data are normally distributed. For



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this reason, Pearson Correlation method that is one of parametric tests was used in the analysis of data. In the significance tests (**) in the study, the reliability level of .01 was considered

Results

Purpose of this study is to examine status of high school students' online game addiction and here are the findings of research conducted on the relationship of online gaming addiction and feeling loneliness, aggression, and depression tendencies and comments of them.

Descriptive statistics related to online gaming addiction status, loneliness, aggression and depression tendencies of high school students are given in Table 1 as the sub-result of the research.

Table 1. Score distribution on high school students' status on online game addiction, loneliness, aggression and depression tendency

Scales	Number of items	Lowest score	Highest score	\bar{x}	ss	\bar{x}/k
Online Game Addiction	21	25.00	100.00	42.61	17.76	2.03
Loneliness	20	20.00	77.00	51.24	9.97	2.56
Aggression Tendency	29	29.00	136.00	73.79	22.02	2.54
Depression Tendency	21	21.00	76.00	31.33	10.47	1.49

As seen in Table 1, descriptive statistics of online gaming addiction status, feeling loneliness, aggression and depression tendencies of high school students are given. According to Table 1, the average score of the high school students' online gaming addictive scale is 42.61 (2.03 out of 5). The total score obtained from the loneliness scale is 51.24 (2.56 out of 4). The total score obtained from the aggression scale was 73.79 (2.54 out of 5), while the score obtained from the depression tendency scale was 31.33 (1.49 out of 4). In this context, it can be said that high school students have low levels of online gaming addiction, moderate levels of loneliness, low levels of aggression, and low levels of depression tendency.

The Pearson correlation analysis results are seen in Table 2 to examine the online game addiction status of high school students in the direction of the research purpose and to determine whether there is a significant relations of students' online game addiction and loneliness, aggression and depression tendencies.

Table 2. Correlation results of online game addiction situations of high school students and loneliness, aggression and depression tendency

		Online Game Addiction	Loneliness	Aggression Tendency	Depression Tendency
Online Game Addiction	r	1	.26**	.44**	.28**
	p		.000	.000	.000
	N	276	276	276	276
Loneliness	r	.26**	1	.47**	.15**
	p	.000		.000	.002
	N	276	276	276	276
Aggression Tendency	r	.44**	.47**	1	.34**
	p	.000	.000		.000
	N	276	276	276	276
Depression Tendency	r	.28**	.15**	.34**	1
	p	.000	.002	.000	
	N	276	276	276	276

When correlations in Table 2 are examined; there is low positive significant correlation between high school students' online gaming addiction and feeling loneliness ($r=.26$; $p<.01$), there is moderate positive significant correlation between online gaming addiction and aggression ($r=.44$; $p<.01$), there is low positive significant correlation between online gaming and depression tendency ($r=.28$; $p<.01$). When other scales are examined, there is moderate positive significant correlation between loneliness and aggression ($r=.47$; $p<.01$), there is low positive significant correlation between loneliness and depression tendency ($r=.15$; $p<.01$), there is moderate positive significant correlation between aggression and depression ($r=.34$; $p<.01$). It can be said that, according to the findings obtained from the research, the students increased their feeling loneliness due to the increase of online gaming addiction, they also increased their aggression behavior due to the increase of online gaming addiction and they increased their depression tendency a bit depending on the increase of online gaming addiction. In reducing online game addiction; taking preventative measures can be taken to decrease online game playing addiction and to reduce addicted user's feelings of loneliness, their tendency to engage in depression and aggression tendencies.

Discussion and Conclusion

The results of this research conducted to examine the online game addiction status of high school students and to examine the relationship of online game addiction and loneliness, aggression and depression tendencies of students reveal that the addictive status of high school students is low. It was observed there is also a low positive significant correlation between online gaming addiction and loneliness, a moderate positive significant correlation between online game addiction and aggression



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tendencies, and a low positive significant correlation between online gaming addiction and depression tendencies. When these findings are taken into consideration, it is seen that the aggression is the highest variation of correlation between online game addiction and the other variations.

When the literature is examined, it is seen that there are various research results which are similar to the results of this research. According to the research results made by Eyyüpoğlu (2017); computer game addiction and internet addiction predicted adolescence disobedience separately and together - there is strong relations of adolescence disobedience, computer game addiction and internet addiction positively. And a result of our research, it is found that there is a moderate positive significant correlation between online game addiction and aggression tendencies. According to the results of Odabaş (2016), online game addiction and subjective happiness have a significant negative correlation. And as a result of our research, it was found that there is a low positive correlation between high school students' online game addiction and their feeling loneliness, and a low positive correlation between online game addiction and depression tendencies. When the tendency of loneliness and depression are evaluated as predictors of unhappiness, findings can be said to be consistent with the results of the research done by Odabaş (2016).

It can be said that in the direction of the findings obtained from the research in reducing the aggression behaviors seen in high school students, it is beneficial to decrease their game addictions. In this case, parents and teachers should keep an eye on the habits and addictive situations of adolescents showing aggressive behavior. Depression and loneliness can also be seen as variations contributing to adolescents' game addiction status. For this reason, social support for adolescents in this situation may be useful in reducing gaming addictions. Besides in their research Yılmaz, Karaođlan Yılmaz, Öztürk and Karademir (2017) indicate that the majority of the students are insufficient regarding information security and computer usage awareness and they could be under risk in online settings towards the threats. For these reasons, parents of students who are playing online games should be more careful and direct their children. Karaođlan Yılmaz and Çavuş Ezin indicate that through the necessary institutions and organizations to prevent damage to parents and children, preventing and raising awareness is required. Teachers who are one of the most important instructors in this area should also be aware of online risks and cyber bullying (Sezer, Yılmaz, & Karaoglan Yılmaz, 2015). Because online games platforms contain many risks in terms of information security and cyber bullying.



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References

- Büyüköztürk, Ş. Çakmak, E. K. Akgün, Ö. E. Karadeniz, Ş., & Demirel, F. (2008). *Bilimsel araştırma yöntemleri*. Ankara: Pegem Akademi.
- Demir, A. (1989). UCLA yalnızlık ölçeğinin geçerlik ve güvenilirliği. *Türk Psikoloji Dergisi*, 7(23), 4-18.
- Eni, B. (2017). *Lise öğrencilerinin dijital oyun bağımlılığı ve algıladıkları ebeveyn tutumlarının değerlendirilmesi*. Yüksek Lisans Tezi, Haliç Üniversitesi, İstanbul, Türkiye.
- Eyyüpoğlu, E. (2017). *Lise öğrencilerinin internet ve bilgisayar oyun bağımlılığı ile asilik davranışları arasındaki ilişkinin incelenmesi*. Yüksek Lisans Tezi, Atatürk Üniversitesi, İstanbul, Türkiye.
- Hisli, N. (1989). Beck depresyon envanterinin üniversite öğrencileri için geçerliği, güvenilirliği. *Psikoloji Dergisi*, 7(23), 3-13.
- Horzum, M. B., Ayas, T., & Çakır-Balta, Ö. (2008). Computer game addiction scale for children. *Turkish Psychological Counseling and Guidance Journal*, 3(30), 77-88.
- Horzum, M. B. (2011). İlköğretim öğrencilerinin bilgisayar oyunu bağımlılık düzeylerinin çeşitli değişkenlere göre incelenmesi. *Eğitim ve Bilim*, 36(159), 56-68.
- Kaplan, N. (2017). *Ortaokul öğrencilerinde internet bağımlılık düzeylerinin sağlık üzerine etkilerinin incelenmesi*. Yüksek Lisans Tezi, İzmir Katip Çelebi Üniversitesi, İzmir, Türkiye.
- Karaoğlan Yılmaz, F. G., & Çavuş Ezin, Ç. (2017). Ebeveynlerin bilgi güvenliği farkındalıklarının incelenmesi. *Eğitim Teknolojisi Kuram ve Uygulama*, 7(2), 41-57, <https://doi.org/10.17943/etku.288874>.
- Karaoğlan Yılmaz, F. G., Dilen, A., & Durmuş, H. (2018). Lise öğrencilerinin mobil öğrenme araçlarını kullanma öz-yeterlik düzeylerinin incelenmesi [The examination of high school students' self-efficacy levels of mobile learning tools]. *SDU International Journal of Educational Studies*, 5(1), 1-12.
- Karaoglan Yılmaz, F., G., Yılmaz, R., Teker, N., & Keser, H. (2014). Prediction of internet addiction of university students based on various variables. *World Journal on Educational Technology*, 6(1), 75-87.
- Kaya, A. B. (2013). *Çevrimiçi oyun bağımlılığı ölçeğinin geliştirilmesi: Geçerlik ve güvenilirlik çalışması*. Yüksek Lisans Tezi, Gaziosmanpaşa Üniversitesi, Tokat, Türkiye.
- Madran, H. A. D. (2012). Buss-Perry saldırganlık ölçeği'nin Türkçe formunun geçerlik ve güvenilirlik çalışması. *Türk Psikoloji Dergisi*, 24(2), 1-6.



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Sezer, B., Yılmaz, R., Karaoglan Yılmaz, F. G., (2015) Cyber bullying and teachers' awareness. *Internet Research*, 25(4), 674-687, <https://doi.org/10.1108/IntR-01-2014-0023>.

Odabaş, Ş. (2016). *Üniversite öğrencilerinin online oyun bağımlılığı düzeylerinin öznel mutluluk düzeyleriyle ilişkisi*. Yüksek Lisans Tezi, Sakarya Üniversitesi, Sakarya, Türkiye.

Yılmaz, R., Karaoglan Yılmaz, F. G., Öztürk, H. T., & Karademir, T. (2017). Examining secondary school students' safe computer and internet usage awareness: an example from Bartın province [Lise öğrencilerinin güvenli bilgisayar ve internet kullanım farkındalıklarının incelenmesi: Bartın İli Örneği]. *Pegem Eğitim ve Öğretim Dergisi*, 7(1), 83-114, <https://doi.org/10.14527/pegegog.2017.004>.

Çocuklarda internet bağımlılığının sınıflandırılması ve psikolojik ve sosyal sorunlarla birlikteliğinin incelenmesi

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Özet:

Amaç: Çalışmanın amacı çocuklarda internet kullanımının bağımlılık durumlarını tespit etmek, sınıflandırmak ve psikolojik ve sosyal sorunlarla birlikteliğini değerlendirmektir.

Gereç ve yöntem: Çalışmada Kasım 2015-Mayıs 2016 eğitim-öğretim yılında Ankara ili Gölbaşı ilçesindeki özel bir okulda öğrenim gören yaşları 9-14 arası 300 çocuk ele alındı. 35 sorudan oluşan internet bağımlılığı anketi, 27 sorudan oluşan depresyon ölçeği, 25 sorudan oluşan sosyal fobi ölçeği, 18 sorudan oluşan sosyal anksiyete ölçeği ve 25 sorudan oluşan güçler ve güçlükler anketi ile veriler elde edildi. İnternet bağımlılığı ölçeğine göre çocuklar bağımlı olmayan grup, eşik grubu, risk grubu ve bağımlı grup olmak üzere 4 grup olarak sınıflandırıldı. Depresyon ölçeğine göre kesme puanı 19 olarak kabul edildi. Diğer ölçeklerde kesme puanı belirlenmediğinden ortalama puan ele alınarak, puan arttıkça klinik sorunlara yatkınlığın arttığı şeklinde değerlendirme yapıldı.

Bulgular: İnternet bağımlılığı ölçeğine göre 261 (%87) kişiden oluşan büyük çoğunluğun internet bağımlısı olmadığı saptandı. 29 (%9,7) kişi eşik grubunda, 9 (%3) kişi ise risk grubunda idi. 1 (%0,3) kişi ise internet bağımlısı olarak belirlendi. Bağımlılık durumu ile depresyon duygu durumu karşılaştırıldığında risk grubunda depresyon görülme olasılığının daha yüksek olduğu ($p=0,001$) görüldü. Sosyal fobi ve sosyal anksiyete puanlarına göre yapılan karşılaştırmada risk grubu ve eşik grubundakilerin bağımlı olmayan gruba göre istatistiksel olarak anlamlı derecede daha yüksek sosyal fobi ve sosyal anksiyete puanlarına sahip olduğu saptandı ($p<0,05$). Güçler ve güçlükler anketi değerlendirmesinde ise eşik grubundakilerin anket puanlarının bağımlı olmayan gruba göre daha yüksek olduğu tespit edildi. Haftalık internet kullanım süresi arttıkça ölçek puanının da arttığı, eşik ve risk grubundaki kişilerin bağımlı olmayan kişilere göre istatistiksel olarak anlamlı derecede haftalık olarak daha uzun süre internet kullandıkları görüldü ($p<0,05$). İnternette twitter kullanan kişilerin istatistiksel olarak anlamlı derecede daha fazla internet bağımlısı oldukları saptandı ($p=0,014$).



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Sonuç: Çocuklarda internet bağımlılığı ile psikolojik ve sosyal sorunların birlikteliği göz ardı edilmemesi gerektiği, bilinçli internet kullanımı ile bu problemlerin büyük oranda önlenileceği kanaatine varılmıştır.

Anahtar kelimeler: İnternet bağımlılığı, depresyon, sosyal fobi, anksiyete, güçlükler, çocuk

Giriş:

Son yıllarda ergenler ve erişkinler için internet en önemli eğitim ve eğlence aracı haline gelmiştir. İnternet ile bilgiye ulaşmak ve dünya çapında diğer insanlarla iletişime geçmek kolay ve hızlı bir şekilde mümkün olmaktadır. Bununla birlikte internet kullanımının kontrolünün kaybedilmesi günlük yaşam, aile ilişkileri ve duygusal ilişkileri olumsuz yönde etkileyebilmektedir. İnternet bağımlılığı ya da problemlili internet kullanımı davranışsal bağımlılığın bir tipi olarak tanımlanmıştır (1). Depresyon internet bağımlılığı ile en fazla ilişkili bulunan psikolojik bozukluktur. Bununla birlikte yapılan çalışmalar internet bağımlılığı ve psikiyatrik semptomlar arasında iki taraflı ilişki olduğunu desteklemektedir (2).

Çalışmanın amacı çocuklarda internet kullanımının bağımlılık durumlarını tespit etmek, sınıflandırmak ve psikolojik ve sosyal sorunlarla birlikteliğini değerlendirmektir.

Materiyal ve Metod:

Çalışmada Kasım 2015-Mayıs 2016 eğitim-öğretim yılında Ankara ili Gölbaşı ilçesindeki özel bir okulda öğrenim gören yaşları 9-14 arası 300 çocuk ele alındı. Çocukların yaş, cinsiyet, ailevi özellikleri, internet kullanım süresi, internete erişim için kullandıkları araçlar, internet kullanım amaçları, kullandıkları sosyal medya türleri gibi soruları içeren kişisel bilgileri kaydedildi. 35 sorudan oluşan internet bağımlılığı ölçeğini doldurmaları istendi (3). Likert tipi derecelmeler; “tamamen katılıyorum”, “katılıyorum”, “kararsızım”, “katılmıyorum”, “kesinlikle katılmıyorum” şeklinde idi. Ölçek maddeleri 5’ten 1’e doğru puanlandırılmış olup, “tamamen katılıyorum” derecesine 5 puan karşılık gelirken “kesinlikle katılmıyorum” derecesine 1 puan karşılık gelmekte idi. İnternet bağımlılığı ölçeğine göre çocuklar bağımlı olmayan grup, eşik grubu, risk grubu ve bağımlı grup olmak üzere 4 grup olarak sınıflandırıldı. Ölçek toplam puanı üzerinden değerlendirme aşağıdaki gibi yapıldı:

35-91 puan: Bağımlı olmayan

92-119 puan: Eşik grubu

120-147 puan: Risk grubu

148-175 puan: Bağımlı grup (4)



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Daha sonra 27 sorudan oluşan depresyon ölçeği, 25 sorudan oluşan sosyal fobi ölçeği, 18 sorudan oluşan sosyal anksiyete ölçeği ve 25 sorudan oluşan güçler ve güçlükler anketi ile veriler elde edildi. Depresyon ölçeğine göre kesme puanı 19 olarak kabul edildi. Sosyal fobi ölçeği için kesme puanı 90. yüzdelik sıraya karşılık gelen 67 puan olarak hesaplandı. 67 puan üstü hastalarda sosyal fobinin var olduğu puan arttıkça klinik sorunlara yatkınlığın arttığı şeklinde değerlendirme yapıldı. Sosyal anksiyete ölçeği ve güçler ve güçlükler anketi için de kesme puanı olmadığından ortalama puan ele alınarak puan arttıkça klinik sorunlara yatkınlığın arttığı şeklinde değerlendirme yapıldı (5-8). Çocuklardaki internet bağımlılığı durumu ile depresyon, sosyal fobi, anksiyete ve güçlük durumları arasındaki ilişki karşılaştırıldı.

Öğrencilerin demografik verileri The Statistical Package for the Social Science Program (SPSS) versiyon-21 ile değerlendirildi. Veriler sıklık (%), ortalama \pm standart sapma (SD), ortanca, minimum ve maksimum değerlerine göre analiz edildi. Karşılaştırmalarda Pearson Chi-Square, Kruskal Wallis, Mann Whitney U ve Spearman korelasyon testleri kullanıldı. $p < 0,05$ değerleri istatistiksel olarak anlamlı kabul edildi.

Çalışma için etik kurul onayı alındı.

Sonuçlar:

Öğrencilerin demografik özelliklerine ilişkin bulgular tablo 1 de verilmiştir.

Öğrencilerin interneti kullanma amaçlarının sırasıyla ödev hazırlama (%21,6), film izleme/müzik dinleme (%21,6), oyun oynama (%20,3), sosyal paylaşım sitelerini kullanma (%19,9) olduğu görüldü. Öğrencilerin %54,4'ü internet kullanırken ebeveynleri tarafından denetlendiğini bildirdi. Öğrencilerin interneti kullanma süresi $5,58 \pm 2,60$ yıl idi. Haftalık internet kullanım süreleri ise $9,84 \pm 10,64$ (minimum 0, maksimum 110 saat) saat idi. Günlük cep telefonu kullanma süreleri ise $104,05 \pm 85,64$ dakika idi. Öğrencilerin büyük çoğunluğu (%85,5) ailesi ile evde toplu olarak bir şeyler yaptığını belirtti. Haftalık internet kullanım süresi arttıkça ölçek puanının da arttığı, eşik ve risk grubundaki kişilerin bağımlı olmayan kişilere göre istatistiksel olarak anlamlı derecede haftalık olarak daha uzun süre internet kullandıkları görüldü ($p < 0,05$).

Sosyal medya hesabı olarak 261 (%87,9) öğrenci whatsapp, 189 (%63,6) öğrenci facebook, 56 (%18,9) öğrenci twitter kullandıklarını bildirdi. İnternette twitter kullananların istatistiksel olarak anlamlı derecede daha fazla internet bağımlısı oldukları saptandı ($p = 0,014$).

Öğrencilerin internet bağımlılık düzeyleri tablo 2'de görülmektedir.

İnternet bağımlılığı grupları ile öğrencilerin depresyon duygu durumları karşılaştırıldığında risk grubunda depresyon görülme olasılığının istatistiksel olarak daha yüksek olduğu bulundu (tablo 3).



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Bağımlı olmayan grup ile eşik grubu karşılaştırıldığında eşik grubundaki öğrencilerin daha yüksek sosyal fobi, sosyal anksiyete ve güçler ve güçlükler anketi puanına sahip oldukları bulundu (p değerleri sırasıyla 0,006, 0,001, 0,031). Yine bağımlı olmayan grupla risk grubu karşılaştırıldığında risk grubundaki öğrencilerin daha yüksek sosyal fobi ve sosyal anksiyete puanına sahip oldukları tespit edildi (p değerleri sırasıyla 0,014, 0,013).

İnternet bağımlılığı ile toplam depresyon, sosyal fobi ve sosyal anksiyete puanları arasında orta derecede bir korelasyon olduğu ve bu korelasyonun istatistiksel olarak anlamlı olduğu bulundu ($p < 0,05$)

Tartışma:

Özellikle okul çağındaki gençlerde oldukça sık görülen, psikolojik ve bedensel gelişimlerinin, sosyal ilişkilerini olumsuz yönde etkileyerek akademik başarılarını da düşüren aşırı şekilde internet/bilgisayar kullanımı bireyin hem akademik hem de kişisel gelişimini negatif yönde etkilemekte, kişiyi bağımlı hale getirmektedir. Bu bağlamda da ortaya çıkan “bağımlılık” kavramının tanımının iyi yapılarak nedenlerinin, belirtilerinin ve çözüm önerilerinin ortaya konulması önem taşımaktadır (9).

Hong Kong’da yapılan çalışmalarda ortaokul öğrencilerinde internet bağımlılığı ile sosyal destek ve duygusal bozukluklar arasındaki ilişki incelenmiş, yüksek sosyal desteğe sahip çocuklarda internet bağımlılığı ve duygusal bozuklukların daha düşük oranda görüldüğü ileri sürülmüştür. Sosyal destek, duygu bozukluğu ve internet bağımlılığı arasındaki ilişkinin kız öğrenciler arasında daha güçlü olabileceğini ileri sürmüşlerdir (10). Çalışmamızda internet bağımlılığı ile öğrencilerin cinsiyet, yaş, ailevi özellikleri (anne-baba eğitimi, fiziksel ve ruhsal hastalıkları, kardeş sayısı, ev şartları, ebeveyn denetimi vs) arasında istatistiksel olarak anlamlı ilişki bulunamadı. Bunda çalışmaya dahil edilen öğrencilerin özel bir okulda öğrenim gören öğrencilerden oluşması sosyoekonomik açıdan farklılık görülmemesinin nedeni olarak gösterilebilir.

Hong Kong’da ortaokul öğrencileri ile yapılan başka bir çalışmada öğrencilerin yarısından fazlasının (%52,1) haftada 11 saatten fazla internet kullandıkları, bunların %9’unun haftada 50 saatten fazla internet kullandıkları, %10,9’unun internet bağımlılığı için kesme skor değerinin üzerinde kaldıkları bulunmuştur (10). Çalışmamızda öğrencilerin haftalık internet kullanım süreleri benzer şekilde $9,84 \pm 10,64$ (minimum 0, maksimum 110 saat) saat idi. Haftalık internet kullanım süresi arttıkça internet bağımlılığı ölçek puanının da arttığı, eşik ve risk grubundaki kişilerin bağımlı olmayan kişilere göre istatistiksel olarak anlamlı derecede haftalık olarak daha uzun süre internet kullandıkları görüldü.

Dünya geneline bakıldığında internet bağımlılığının Asya kültürlerinde en önemli sorun olduğu görülmektedir. Çin okullarında %2,4-13,5, Güney Kore’de adölesanlarda %1,6-20,3, ABD’de adölesanlarda ve kolej öğrencilerinde %0,7-26,3, Avrupada benzer şekilde %1-18,3 olarak bildirilmiştir (11). Ülkemizde 352 öğrenci ile yapılan bir çalışmada



internet bağımlılığı oranı %11, internet bağımlısı olma potansiyeli olan öğrencilerin oranı ise %12 bulunmuştur. Bu öğrencilerin 7. ve 8. sınıf öğrencilerinin olması dikkat çekicidir (9). Çalışmamızda internet bağımlısı öğrencilerin oranı %0,3, internet bağımlısı olma potansiyeli olan öğrencilerin oranı ise %3 olup Asya geneline ve ülkemizdeki çalışmaya göre daha düşük oranda idi.

İnternet bağımlılığı en yaygın olarak 12-18 yaş adolesanlarda görülmektedir. Ülkemizde 11-16 yaş arası internet bağımlısı olarak değerlendirilen 41 öğrenci ile yapılan bir çalışmada, öğrencilerin %64,3'ünün 11-13 yaş, %35'inin ise 14-16 yaş arasında olduğu bildirilmiştir. 14-16 yaş grubunda daha düşük oranda çıkmasının nedeni olarak o yaş döneminde öğrencilerin ulusal, merkezi sınavlara hazırlanması gösterilmiştir. Yine aynı çalışmada bağımlı grup ile kontrol grubu arasında yaş, cinsiyet, sınıf, ekonomik durum, anne ve baba yaş ve eğitim durumu açısından belirgin farklılık bulunmamış (12). Çalışmamızda da benzer şekilde bağımlı olmayan grup ile diğer gruplar arasında demografik özellikler açısından anlamlı farklılık bulunamadı. Bilindiği üzere bağımlılık durumları ile diğer psikiyatrik bozukluklar birlikte görülebilmektedir. Bunlardan biri de internet bağımlılığı ile diğer psikiyatrik bozuklukların birlikteliğidir (1). İnternet bağımlılığı ile dikkat eksikliği hiperaktivite bozukluğu, depresyon, dürtü kontrol bozukluğu ve anksiyetenin ilişkili olduğu gösterilmiştir. Bunlar arasında internet bağımlılığı ile en fazla ilişkili bulunan psikiyatrik bozukluk depresyondur (2). Bununla birlikte internet bağımlılığı ile depresyon arasındaki nedensel ilişki henüz kanıtlanamamıştır (1). Bir çalışmada serotonin fonksiyonları ile ilişkili olan 5HTTLPR gen polimorfizminin depresyon ve internet bağımlılığı ile ilişkili olduğu ileri sürülmüştür (13). Hong Kong'da yaşları 15-19 arası 208 adolesanla yapılan bir çalışmada internet bağımlılığı semptomları olan büyük çoğunlukta ciddi intihar düşüncesi ve depresyon durumunun olduğu bulunmuş; Kore'de yaşları 15-16 arası 1573 adolesanla yapılan başka bir çalışmada ise depresyon ve intihar düşüncesi düzeylerinin internet bağımlılığı olan grupta bağımlı olmayan ve muhtemel bağımlı gruba göre daha yüksek olduğu bildirilmiştir (14, 15). Ülkemizde yapılan çalışmada ise internet bağımlılığı ve intihar düşüncesi majör depresif bozukluğu olan olgularda ilişkili bulunmamıştır (2).

Çalışmamızda öğrencilerde internet bağımlılığı ölçek puanı arttıkça depresyon, sosyal fobi ve sosyal anksiyete puanlarının da arttığı görüldü. Bu da internet bağımlılığı ile depresyon, sosyal fobi ve sosyal anksiyete arasında ilişki olduğunu önceki çalışmalarda olduğu gibi desteklemektedir.

Sosyal kaygı ve problemlerle internet kullanımı ilişkisi değerlendirildiğinde, sosyal kaygısı bulunan bireylerin internet ortamında kendilerini sosyal açıdan daha yeterli algıladıkları ileri sürülebilir. Sosyal kaygılı bireyler için internet ortamı yüz yüze iletişime göre daha az tehdit edici ve ödüllendiricidir. Bu nedenle sosyal kaygısı yüksek olan bireyler interneti aşırı kullanabilmekte, bu durum bireylerin aile ve okul hayatında olumsuz sonuçlar doğurabilmektedir. Bu çerçevede sosyal kaygının problemlerle internet kullanımının oluşmasında önemli bir yere sahip olduğu düşünülmektedir (16).



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Tayvan’da 555 lise öğrencisi ile yapılmış bir çalışmada internet bağımlılığı, sosyal kaygı ve kişilerarası ilişkiler arasındaki ilişkiyi incelenmiş, sağlıklı ebeveyn-çocuk ilişkileri ile kişilerarası ilişkiler arasında pozitif yönde anlamlı ilişki olduğu, sağlıklı ebeveyn-çocuk ilişkileri ve kişilerarası ilişkiler ile sosyal kaygı arasında ile negatif yönde anlamlı ilişki olduğu bulunmuştur. Bunun yanında sağlıklı ebeveyn-çocuk ilişkileri, kişilerarası ilişkiler ve sosyal kaygının internet bağımlılığını önemli derecede yordadığı belirlenmiştir (17).

Çalışmamızda öğrencilerde internet bağımlılığı ölçek puanı arttıkça depresyon, sosyal fobi ve sosyal anksiyete puanlarının da arttığı görüldü. Bu da internet bağımlılığı ile depresyon, sosyal fobi ve sosyal anksiyete arasında ilişki olduğunu önceki çalışmalarda olduğu gibi desteklemektedir.

Sonuç:

Çocuklarda internet bağımlılığı ile psikolojik ve sosyal sorunların birlikteliği göz ardı edilmemesi gereken bir durumdur. Ancak internet bağımlılığı ile psikososyal problemlerin birlikteliğinin değerlendirilmesi için daha kapsamlı ve değişik sosyoekonomik gruplarda da geniş çaplı araştırmalara ihtiyaç duyulmaktadır. Ayrıca özellikle adölesan ve genç erişkinlerde bilinçli internet kullanımı ile psikososyal sorunların büyük ölçüde önüne geçilebileceği kanaatine varılmaktadır. Bunun için de hayatın her alanında kullanılan internetin bilinçli kullanılması ile ilgili olarak okullarda eğitim verilmesi gerekliliği olduğu düşünülmektedir.

Kaynaklar:

1. Ko CH, Yen JY, Yen CF, Chen CS, Chen CC. The association between Internet addiction and psychiatric disorder: A review of the literature. *European Psychiatry* 2012; 27: 1-8.
2. Alpaslan AH, Soylu N, Kocak U, Guzel HI. Problematic Internet use was more common in Turkish adolescents with major depressive disorders than controls. *Acta Pædiatrica* 2016; 105: 695-700.
3. Günüş S, Kayri M. Türkiye’de internet bağımlılık profili ve internet bağımlılık ölçeğinin geliştirilmesi: Geçerlilik ve güvenilirlik çalışması. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi* 2010; 39: 220-232.
4. Gökçearslan Ş, Günbatır MS. Ortaöğrenim öğrencilerinde internet bağımlılığı. *Eğitim Teknolojisi Kuram ve Uygulama* 2012; 2: 10-24.
5. Kovacs M. The children’s depression inventory (CDI). *Psychopharmacol Bulletin* 1985; 21: 995-998.
6. Demir T, Eralp-Demir D, Özmen E, Uysal Ö. Çapa Çocuk ve Ergenler için Sosyal Fobi Ölçeğinin Geçerlilik ve Güvenilirliği. *Düşünen Adam* 1999; 12(4): 23-30.



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7. Demir T, Eralp-Demir D, Türksoy N, Özmen E, Uysal Ö. Çocuklar İçin Sosyal Anksiyete Ölçeğinin Geçerlilik ve Güvenilirliği. *Düşünen Adam* 2000; 13(1): 42-48.
8. Güvenir T, Özbek A, Baykara B, Arkar H, Şentürk B, İncekaş S. Güçler ve güçlükler anketinin (GGA) Türkçe uyarlamasının psikometrik özellikleri. *Çocuk ve Gençlik Ruh sağlığı Dergisi* 2008; 15(2): 65-74.
9. Kılınç M, Doğan A. Ortaokul 7. ve 8. sınıf öğrencilerinin internet bağımlılığı ile biliş üstü farkındalıklarının çeşitli değişkenler açısından incelenmesi. *Turkish Studies-International Periodical For The Languages, Literature and History of Turkish or Turkic* 2014; 9/5: 1385-1396.
10. Mo PKH, Chan VWY, Chan SW, Lau JTF. The role of social support on emotion dysregulation and Internet addiction among Chinese adolescents: A structural equation model. *Addictive Behaviors* 2018; 82: 86-93.
11. Mihajlov M, Vejmelka L. Internet addiction: A review of the first twenty years. *Psychiatria Danubina* 2017; 29 (3): 260-272.
12. Uysal G, Balci S. Evaluation of a school-based program for Internet addiction of adolescents in Turkey. *J Addict Nurs*. 2018; 29(1): 43-49.
13. Lee YS, Han DH, Yang KC, Daniels MA, Na C, Kee BS, Renshaw PF. Depression-like characteristics of 5HTTLPR polymorphism and temperament in excessive internet users. *J Affect Disord* 2008; 109(1-2): 165-169.
14. Fu KW, Chan WS, Wong PW, Yip PS. İnternet addiction: prevalence, discriminant validity and correlates among adolescents in Hong Kong. *Br J Psychiatry* 2010; 196: 486-492.
15. Kim K, Ryu E, Chon MY, Yeun EJ, Choi SY, Seo JS, Nam BW. Internet addiction in Korean adolescents and its relation to depression and suicidal ideation: a questionnaire survey. *Int J Nurs Stud* 2006; 43. 185-192.
16. Zorbaz O. Lise öğrencilerinin problemleri internet kullanımının sosyal kaygı ve ekran ilişkileri açısından incelenmesi. *HÜTF Eğitim Bilimleri Bölümü Tez Koleksiyonu Ankara*, 2013.
17. Liu CY, Kuo FY. A study of Internet addiction through the lens of the interpersonal theory. *Cyberpsychol Behav* 2007; 10(6): 799-804.



Move to Learn: Designing and Developing Kinect-based Games in Education

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Abstract

Kinect has great potential to enhance classroom interactions and to support student creativity. In this study, it is analyzed in terms of a tool for teaching and the main aim is to examine developing and using process of Kinect-based games in education. Kinect2Scratch is selected for development environment for motion based games and prepare games with help of it. As a conclusion, these games have potential to create enjoyable environment, to enhance student motivation, and to promote learning via Kinect’s sensory capacity.

Keywords: *Kinect, Motion Detection, Games, Education*

Introduction

Video games gets increasing attention and space in our daily lives as an interactive entertainment media. The research on the advantages of games are broadening as well. Especially cognitive and psychological effects of games are inspected in educational literature [1]. However there are some new properties to games as new technologies emerge. Motion based games are one of them, requiring users to be physically active as well. Technologies such as Nintendo Wii, Microsoft Kinect, Sony PlayStation Move have made movement-based video games highly popular. These developments might create new opportunities for improvements in educational contexts. In this study, Microsoft Kinect technology will be discussed as a motion based games technology in educational area.

Kinect Technology

Since its release in 2010 by Microsoft, Kinect (Figure 1) has been one of the best motion sensors in the market. It was optional to purchase alongside Xbox 360, as well as its successor Kinect version two for Xbox One. They mainly allow users to play games only with their body, without the need of a controller. Thus opening wide range of possibilities of motion and gestures, Kinect struck the attention of developers to create varying applications about education, healthcare, and entertainment [2].



Figure 1. Kinect for Xbox 360 and Windows

The Kinect, compatible with Xbox 360 and Windows, incorporates some advanced sensing hardware. It contains a depth sensor, an infrared projector, a color camera, and a four-microphone array, in order to provide full-body 3D motion capture, facial recognition, and voice recognition. Thus allowing developers to easily create applications that users can interact with their body in a natural way.

Kinect Based Learning

Today, human body movement is used to increase the interaction in various area. The applicability of motion-based processing technology has been initiated in game environments. Kinect technology, the primary starting point in the first year is also seen in the field of games. With these innovations brought to the game technologies, it has been used in different fields. Especially in the field of education, in addition to visual and auditory education methods in learning environments, it provides the possibility of doing work in which it is added in physical activities with Kinect technology. In terms of a tool for teaching, Kinect has the following four characteristics [3]:

- Kinect is a flexible teaching tool. Educators can use or design contents with interaction of body movements, gesture and voice without using keyboard or mouse.
- Kinect can accommodate multiple users. Kinect games can have two people playing at the same time.
- Kinect is a versatile tool. As it collects three-dimensional information, Kinect can support various teaching activities such as dance and martial arts.
- Kinect engages students. The interactions enabled by Kinect support multiple physical engagement patterns, involve more time on task from students, and imply better utilization of multiple intelligences.

Kinect is said to increase the interaction within the classroom, and it is said that there is great potential to improve students' creativity in the literature. Here are a few examples: using Kinect-based games to help students with dyslexia [4], combining

Kinect with a system called L-shape platform to provide students to learn interactively with body movements in a classroom environment [5], using Kinect and augmented reality technology to create learning environments by moving virtual objects [6], and use of SpatialEase developed in Kinect in second language education [7].

Kinect2scratch

Kinect2Scratch is a kind of development environment for motion based games. It is an extension for Scratch 1.4 and Scratch 2.0 that enables Scratch coders program with the Kinect sensor for Xbox 360 or Xbox One [8]. Actually, Scratch is a free educational programming environment developed in MIT Media Laboratory. With a web portal and interactive interface with over 30 million registered members and more than 32 million installed projects, the Scratch tool helps to make programming concepts easier to learn, as well as making programming more fun and visual. Kinect2Scratch use the Scratch tool with Kinect cameras. Thus, it allows users to construct scripts by dragging-and-dropping code blocks and help to prepare motion based games.

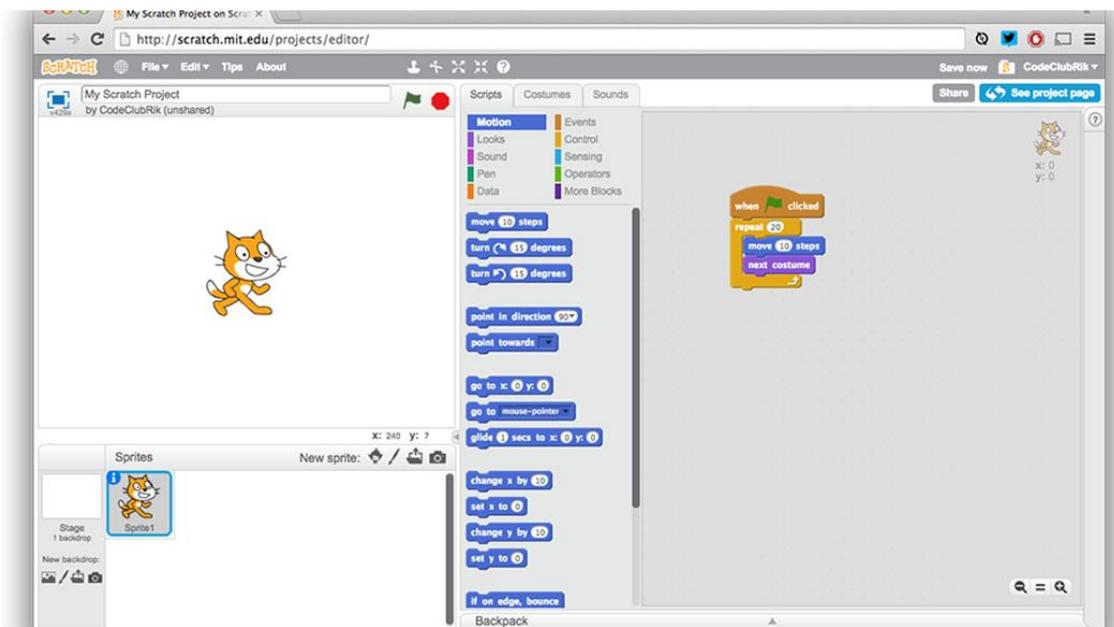


Figure 2. Scratch 2.0 (<http://scratch.mit.edu>)

Kinect2Scratch combining with Scratch allows kids to interact with software program they developed, without having to touch the screen, the keyboard or a mouse. Figure 3 shows Kinect2Scratch running simultaneously with Scratch.

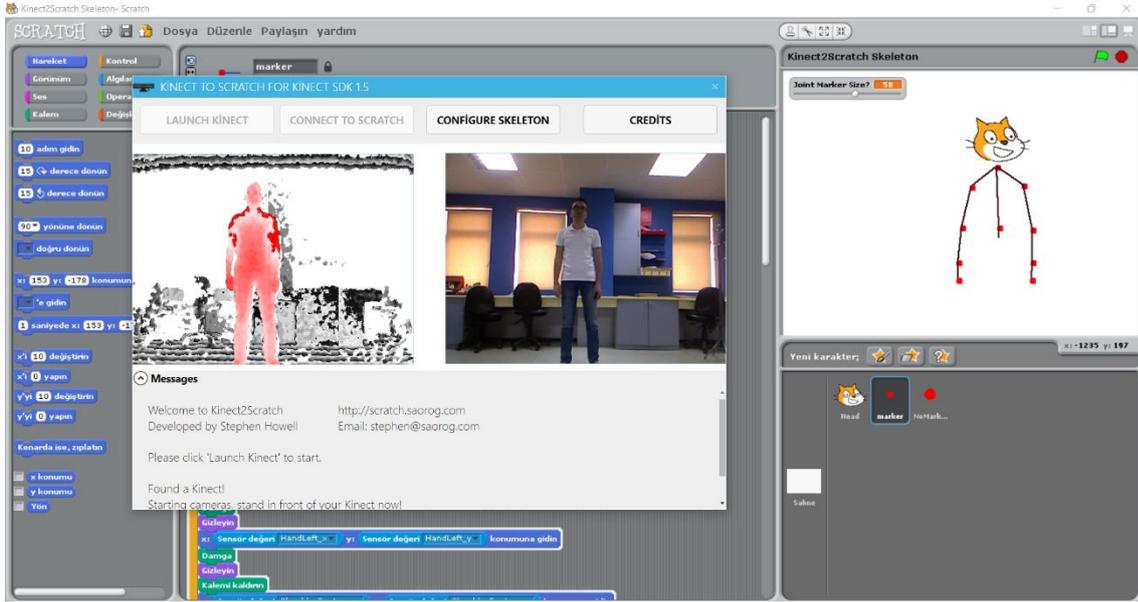


Figure 3. Kinect2Scratch

The student-Kinect-Computer trio is illustrated in Figure 4 as a model while playing the games.

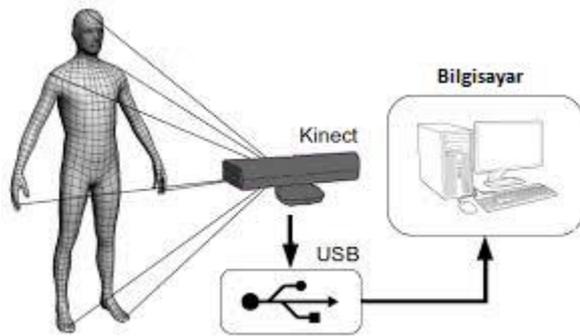


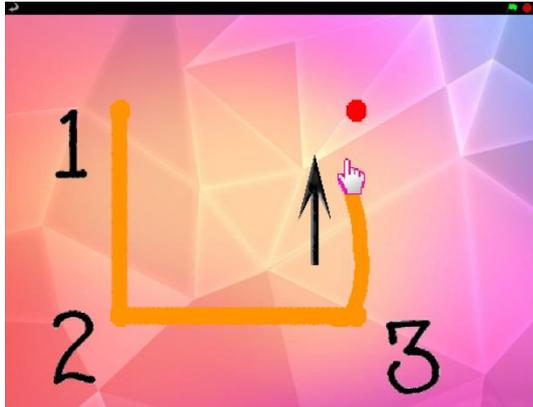
Figure 4. Connection of Kinect and computer

-Games

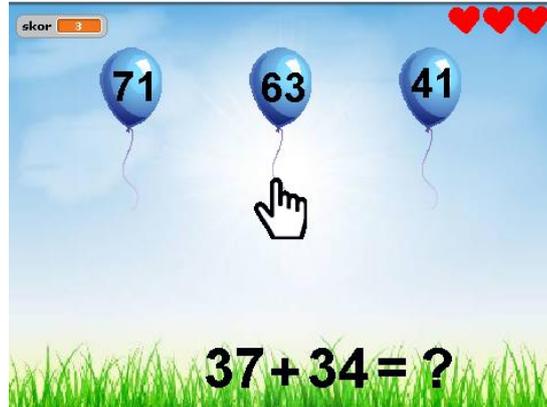
In this study, geometric shapes and the four operations were selected for the content of the two games we developed, targeting second grade students in Figure 5. Geometric shapes game requires player to draw basic shapes like triangle, square, circle etc. one by one. Player draws the shapes on the air with their right hand gestures, and moves the cursor on the screen to follow the paths and reach the corners of the shapes.

For the second game, four operations game consists of five levels, addition, subtraction, multiplication, division, and mixed of the four. Each level has nine questions with three different difficulty levels. Questions and their answer options are entirely randomly

generated each time, considering the difficulty levels easy, moderate and hard, having three questions each. Player uses their right hand to reach towards the correct answer up in the air, and if right catches the balloon, thus increasing their score.



Geometric shapes game



Four operations game

Figure 5. An example of screens of games

Conclusion

Kinect has great potential to enhance classroom interactions and to support student creativity. In this study, we analyzed several Kinect based games and developed two games with help of Kinect2Scratch technology for second grade students. These games are easily developed and adapted for classroom interactions. They have potential to create enjoyable, interesting interactions types, to enhance student motivation, and to promote learning via its sensory capacity. As a result, Kinect technology is a new technology and can detect user movements and gestures and transfer them to the computer. It is thought that it can be used in different areas in the following years and in our experience, this technology can be used in the field of education, especially preschool and special education.

References

1. Griffiths, M. D. (2002). The educational benefits of videogames. *Education and health*, 20(3), 47-51.
2. Xu, X., & Ke, F. (2014). From psychomotor to ‘motorpsycho’: Learning through gestures with body sensory technologies. *Educational Technology Research and Development*, 62(6), 711-741.
3. Hsu, H. M. J. (2011). The potential of Kinect in education. *International Journal of Information and Education Technology*, 1(5), 365.



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4. Sarmanho, E.S., Barros E.S., Monteiro D.C., Marques L.B., & de Souza D.G.(2011) A game for teaching children with disability in reading and writing in portuguese using voice recognition and Kinect sensor. *Proceedings of the 10th Brazilian Symposium on Computer Games and Digital Entertainment*, Salvador, Brazil.
5. Lien C.L., Huang C.Y., Wang C.Y., & Chen G.D. (2012). Using Kinect to track learning behavior of students in the classroom as video Portfolio to enhance reflection learning. *Proceedings of the 20th International Conference on Computers in Education (ICCE '12)*.
6. Casas X., Herrera, G., Coma,I, & Fernández, M. A. (2012). Kinect-based augmented reality system for individual with autism spectrum disorders. *Proceedings of the International Conference on Computer Graphics Theory and Applications and International Conference on Information Visualization Theory and Applications (GRAPP/IVAPP '12)*, Rome, Italy.
7. Edge, D., Cheng, K., & Whitney, M. (2013). SpatialEase: learning language through body motion. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '13) ACM*, New York, NY, USA.
8. Howell, S. (2015). Kinect2Scratch [Computer Software].
<http://howell.azurewebsites.net/kinect2scratch/>



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Investigation of Digital Gaming Addiction and Loneliness of University Students

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Abstract

In this study, it is aimed to examine the relationship between digital gaming addiction and loneliness levels of undergraduate students receiving education in the field of health science. Sample group consisted of 483 students attending undergraduate studies in the field of health sciences. Researchers used UCLA Loneliness Scale (ULS-8) developed by Russel, Peplau, and Ferguson (1978) and adapted to Turkish by Doğan, Çötök, and Tekin (2011) and Digital Gaming Addiction Scale developed by Arslan, Kırık, Karaman, and Çetinkaya (2015). Data is analyzed by using one way analysis of variance (ANOVA), t-test, and Pearson correlation coefficient. As a result, it was found that male students have higher levels of digital addiction and loneliness than female students, and students with higher levels of digital addiction and loneliness spend more time on the internet. It was also found that there was a significant positive relationship between digital addiction and loneliness levels.

Keywords: Digital Gaming Addiction, Loneliness, College students

Introduction

Children’s play and socialization habits have changed because of the reasons such as the rapid progress of technology, the increasing number of digital tools and applications in our daily life, urbanizations, and inadequacy of playgrounds. In the process of time, traditional games were replaced by computer games and digital games played via the Internet. The most important effect of digital games is psychological and physiological dependence. Digital game addiction can be defined as excessive use of computer or digital games that cause social and emotional problems and inability to control themselves. Digital game addiction points out negative results emerged. The studies carried out in this area are based on two basic views. The first is that games can make positive contributions to the mental development of children and youngsters at certain points and the second is that an uncontrollable desire to play game can cause addiction and problems in social life (Arslan et al., 2015; Irmak & Erdoğan, 2016; Öncel & Tekin, 2015). When the causes of playing games are examined, it seems that the reasons such as the desire to evaluate his/her leisure time and to escape and struggle, the desire to get rid of the negative conditions of the individual, the need to communicate different persons, and want to escape the real life and be in fantastic atmosphere, activity request that can be focused for a long time can be appear (Horzum et al., 2008).



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Research has emphasized that persons who have digital game addiction has symptoms similar with individuals who have behavioral or chemical dependency. It is suggested that digital game addiction can be defined as gaming disorders which is played on the Internet in Chapter 3 of DSM-5 (Savcı & Aysan, 2017). In another study conducted that on the subject, 1 out of 5 university students is at risk of game addiction. 1 out of 3 students spend time at the game for hours, at least 1 hour each day (Çavuş, Ayhan, & Tuncer, 2016). It was found to be associated with depression, impulsivity, loneliness, sleep quality, anxiety, social isolation, vigilance of communication skills, well-being, self-esteem, academic performance and psychological and sociological disturbances (Şahin & Tuğrul, 2012; Savcı & Aysan, 2017). It is thought that especially loneliness which is felt by university students who are trying to get used to a new atmosphere cause technological addiction.

Loneliness is the unpleasant feeling that results from the difference between an individual's social relationship and the desired social relationship (Elkin, 2017). When the factors affecting loneliness are examined, some problems arising from family, home or school environment are striking. Among these are moving away from home or close friend, disappearing of an owned object, broken family, the death of an important person or a pet are the factors stem from home environment affecting the loneliness of children; school change, rejection by close friends, difficulty in acquiring new friends, and personal characteristics such as lack of social skills or shyness, anxiety and low self-esteem are the factors that cause feelings of loneliness in the school environment (Çakır & Oğuz, 2017; Duyan et al., 2008; Duyan, Var & Kılıç, 2015; Korkmaz, Usta & Kurt, 2014).

Being a member of a group, having a job and directing the future, adapting to a new school and environment bring with many problems in the young people who come away from their families for university. It is quite important to establish satisfactory relationships in this period. In this context, this research which aims to determine the relation between digital game addiction and loneliness levels is thought to contribute positively to the elimination of the risks of digital dependency emerging in recent years. It is expected that young people, especially in the health field, will be more sensitive to health issues. For this reason, the following questions were answered in this study which has participants received education the health science.

1. Are digital game addiction and loneliness levels of undergraduate students in the field of health science differentiated by sex?
2. Are digital game addiction and loneliness levels of undergraduate students in the field of health science differentiated by frequency of use?
3. Is there a meaningful relation between digital game addiction and loneliness levels of undergraduate students studying in health field?



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Method

Design

This study is descriptive survey model and based on quantitative data not intended to reflect the situation as it is.

Participants

Scales was administered to 483 students received education in Faculty of Health Science- Health Science University in the city center of Istanbul by using convenience sampling method. 84.1 % of the students are female students and 15.7 % are male students. It is found that 19% of the students use Internet 1-2 hours, 58,4% of the students use Internet 3-5 hours, 20,3% of them use 6-9 hours and 2,1% use more than 9 hours in a day.

Data Collection Tools

Demographic Information Form, UCLA Loneliness Scale- Short Form, and Digital Addiction Scale were used to collect data in the study.

UCLA Loneliness Scale (ULS-8) Short Form

UCLA Loneliness Scale was developed by Russel, Peplau and Ferguson (1978). Validity and Reliability test of UCLA Loneliness Scale Short Form was studied by Doğan et al. in 2011. The ULS-8 had a positive correlation with social-emotional loneliness and depression and a significantly negative correlation with perceived social support. The correlation between ULS-8 and the UCLA Loneliness Scale was .88 ($p < .001$). The internal consistency of the scale was good with a Cronbach's Alpha of .72.

Digital Addiction Scale

The scale is developed by Arslan, Kırık, Karaman ve Çetinkaya (2015). The scale has a framework of three factors consisting of 29 items. These three factors constitute the dimensions; “Video Game Addiction” consisting of items 1-11, “Social Media Addiction” consisting of items 12-23 and “Effects in Daily Life” consisting of items 24-29.

Data Collection and Analyze

Undergraduate students who want to participate voluntarily in the collection of data are requested to fill the questionnaires. Data is analyzed by using SPSS 20 package program in the computer setting. The normality distribution of the data was analyzed by the Kolmogorov Smirnov Test and the data were analyzed by one way analysis of variance (ANOVA), t-test and Pearson Correlation Coefficient.

Findings

Table 1. reports the mean scores, standard deviation, and t-values of female and male students in relation to the loneliness and digital addiction.

Table 1. UCLA and DGA t-test Scores on Gender

	Gender	N	Mean	Std. Deviation	t	p
UCLA	Female	405	15,00	2,78	-3,019	0,000*
	Male	75	16,12	3,71		
DGA	Female	405	77,05	18,70	-1,880	0,720
	Male	75	81,57	19,20		

According to Table 1, there is a significant difference between gender variables considering UCLA scores ($p < 0,05$). Loneliness levels of male students are higher than females. There is no significant difference between gender of participants on DGA scores ($p > 0,05$). However, the average DGA score of males' is higher than females'. According to this, although digital dependence is not significantly affected by gender, it can be said that male students have higher level of digital dependency.

Table 2. UCLA and DGA ANOVA Results on Frequency of Use

	Frequency of Use	N	Mean	Std. Deviation	F	p
UCLA	1-2 hours	92	14,72	2,78	5,27	0,001*
	3-5 hours	280	15,16	3,02		
	6-9 hours	98	15,26	2,72		
	9 - hours	10	18,60	3,68		
	Total	480	15,17	2,97		
DGA	1-2 hours	92	68,51	17,42	24,55	0,000*
	3-5 hours	281	76,37	16,29		
	6-9 hours	97	89,24	19,60		
	9- hours	10	90,30	30,40		
	Total	480	77,75	18,83		

According to Table 2, there is a meaningful relationship between the frequency of use and UCLA and DGA. Participants' loneliness level and digital addiction level are significantly affected by frequency of use. When group differences are examined, it is seen that there is a significant difference between UCLA as well as DGA scores of internet users who use more than 9 hours and who use 1-2, 3-5, and 6-9 hours.

Table 3. Pearson Correlation Coefficients of UCLA and DGA

		UCLA
DGA	R	,237**
	P	,000
	N	479

According to Table 3, the relationship between UCLA and DGA scores of participants are statistically significant ($p < 0,001$). This relationship has positive direction ($r = 0,237$). As UCLA scores are increasing, the participants’ DGA scores also increase. According to this, level of digital addiction of the participants increase, the level of loneliness increase.

Discussion

As a result of the study, it was determined that there was no significant relation between digital game addiction and gender in undergraduate students in the field of health science, but the average Digital Addiction score of male students was more than female students’. In addition, loneliness levels were significantly affected by gender variable; so, male students have more loneliness score than females’.

It seems that males have digital game addiction more than females in similar research on digital gaming addiction and internet addiction (Çavuş, Ayhan & Tuncer, 2016; Derin & Bilge, 2016; Esen & Siyez, 2011; Gökçeaslan & Günbatır, 2012; İnan, 2010; Tan, Cömert & Ogel, 2009; Üneri & Tanıdır, 2011). It was determined that there is no significant difference in terms of gender in a research on smartphone addiction (Aktaş & Yılmaz, 2017).

In the study of loneliness, it was determined that there was a significant positive correlation between smartphone addiction and loneliness as well as shyness (Aktaş & Yılmaz, 2017). Another study found that there is a meaningful relationship between loneliness level and internet addiction in adolescents (Esen & Siyez, 2011; Özcan & Buzlu, 2005). A study stated that individuals who feel alone are addicted to the internet and that they are not alone because of the internet addiction (Ceyhan, Ceyhan & Gürcan, 2007).

Communication skills and socialization tendencies of individuals who spend a significant part of their time on the internet are affected adversely due to technological dependence (Öğel, 2012; Savcı & Aysan, 2017). This situation increases loneliness level of individuals. As a result of increasing awareness and sensitivity towards digital addiction, it can be said that the level of loneliness of individuals will decrease and so communication skills will enhance. At the top of these individuals are healthcare providers who are particularly in intensive communication with people. It was



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necessary for students who receive education in health science to be aware of the effects of digital addiction and social and psychological problems that arise from this dependence on the individuals as well as environment and to raise awareness of public about necessary precautions to be taken.

Suggestions

It is thought that future studies with different sample groups and research designs will contribute to the evaluations of digital dependency. Carrying out on larger samples will allow generalization of the results of the research. These studies will contribute to diversity and enrichment of literature related to digital game addiction in Turkey. Also, it is important to prepare educational workshops for families and youngsters in the issues of conscious and safe internet use, and spending quality time with the aim of rising awareness about digital addiction. In addition, studies on the reasons that push young people to digital game addiction will help to prevent it.

References

- Aktaş, H., & Yılmaz, N. (2017). Üniversite Gençlerinin Yalnızlık ve Utangaçlık Unsurları Açısından Akıllı Telefon Bağımlılığı. *International Journal of Social Sciences and Education Research*, 3(1), 85-100.
- Arslan, A., Kirik, A. M., Karaman, M. & Çetinkaya, A. (2015). Lise ve üniversite öğrencilerinde dijital bağımlılık. *Uluslararası Hakemli İletişim ve Edebiyat Araştırmaları Dergisi*, 8(8). 34-58.
- Çakır, Ö. & Oğuz, E. (2017). Lise Öğrencilerinin Yalnızlık Düzeyleri ile Akıllı Telefon Bağımlılığı Arasındaki İlişki. *Mersin Üniversitesi Eğitim Fakültesi Dergisi*, 2017; 13(1): 418-429
- Çavuş, S., Ayhan, B. & Tuncer, M. (2016). Bilgisayar Oyunları ve Bağımlılık: Üniversite Öğrencileri Üzerine Bir Alan Araştırması. *İletişim Kuram ve Araştırma Dergisi*, 43, 265-290.
- Ceyhan, E., Ceyhan, A. A. ve Gürcan, A. (2007) Problemlerli İnternet Kullanımı Ölçeği'nin geçerlilik ve güvenilirlik çalışmaları. *Kuram ve Uygulamada Eğitim Bilimleri (KUYEB) Dergisi*, 7, 387–416. Derin & Bilge (2016).
- Doğan, T., Çötök, N. A. & Tekin, E. G. (2011). Reliability and validity of the Turkish Version of the UCLA Loneliness Scale (ULS-8) among university students. *Procedia Social and Behavioral Sciences*, 15, 2058–2062
- Duyan, V., Duyan G., Çifçi E., Sevin, Ç., Erbay, E. & İkizoğlu, M. (2008).” Liselerde Okuyan Öğrencilerin Yalnızlık Durumlarına Etki Eden Değişkenlerin İncelenmesi” *Eğitim ve Bilim (Education And Science)*, 33 (150): 28-41.



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FULL TEXT BOOKLET

Duyan, V., Var, E. C., & Kilic, E. (2015). The adaptation study of the loneliness scale for children to Turkish., *Turkish Journal of Family Medicine & Primary Care*, 9(2), 40-45.

Elkin, N. (2017). Sağlık Bilimleri Yüksekokulu Öğrencilerinin Sosyal Destek ve Yalnızlık Durumlarının Değerlendirilmesi. *Düzce Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi*, 7(2): 89-96.

Esen, E. & Siyez D. (2011). Ergenlerde İnternet Bağımlılığını Yordayan Psiko-sosyal Değişkenlerin İncelenmesi. *Türk Psikolojik Danışma ve Rehberlik Dergisi*, 4 (36), 127-138.

Gökçearslan, Ş. ve Günbatar, M. S. (2012). Ortaöğretim öğrencilerinde internet bağımlılığı. *Eğitim Teknolojisi Kuram ve Uygulama*, 2 (2), 10-24.

Gökçearslan, Ş. & Durakoğlu, A. (2014). Ortaokul Öğrencilerinin Bilgisayar Oyunu Bağımlılık Düzeylerinin Çeşitli Değişkenlere Göre İncelenmesi. *Dicle Üniversitesi Ziya Gökalp Eğitim Fakültesi Dergisi*, 23(14), 419-435.

Horzum, M. B., Ayaş, T. & Çakırbalta, Ö. (2008). Çocuklar İçin Bilgisayar Oyun Bağımlılığı Ölçeği. *Türk Psikolojik Danışma ve Rehberlik Dergisi*, 3(30), 76-88.

İnan, A. (2010). İlköğretim ve Ortaöğretim Öğrencilerinde İnternet Bağımlılığı. Yayınlanmamış Yüksek Lisans Tezi, Atatürk Üniversitesi, Erzurum.

Irmak, A.Y.& Erdoğan, S. (2016). Ergen ve Genç Erişkinlerde Dijital Oyun Bağımlılığı: Güncel Bir Bakış. *Türk Psikiyatri Dergisi*, 1-11. Doi: 10.5080/u13407

Korkmaz Ö, Usta E & Kurt İ.(2014). Sanal Ortam Yalnızlık Ölçeği (SOYÖ) Geçerlik ve Güvenirlik Çalışması. *Hacettepe Üniversitesi Eğitim Fakültesi Dergisi*, 29(2): 144-159.

Ögel, K. (2012). İnternet bağımlılığı- internetin psikolojisini anlamak ve bağımlılıkla başa çıkmak. *Türkiye İş Bankası Kültür Yayınları*. İstanbul.

Öncel, M & Tekin, A. (2015). Ortaokul Öğrencilerinin Bilgisayar Oyun Bağımlılığı ve Yalnızlık Durumlarının İncelenmesi. *İnönü Üniversitesi Eğitim Bilimleri Enstitüsü Dergisi*, 2(4), 7-17.

Özcan, N. K. & Buzlu, S. (2005). Problematic use of the Internet is a tool to help determine the scale of cognitive status on the Internet, the reliability and validity of the university students. *Journal of Addiction*, 6(1), 19-26.

Savcı, M., & Aysan, F. (2017). Teknolojik Bağımlılıklar ve Sosyal Bağlılık: İnternet Bağımlılığı, Sosyal Medya Bağımlılığı, Dijital Oyun Bağımlılığı ve Akıllı Telefon Bağımlılığının Sosyal Bağlılığı Yordayıcı Etkisi. *Düşünen Adam Psikiyatri ve Nörolojik Bilimler Dergisi*, 30(3), 202-216.



International Child and Information Safety Congress
“Digital Games”
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Şahin, C. & Tuğrul, M. (2012). İlköğretim Öğrencilerinin Bilgisayar Oyunu Bağımlılık Düzeylerinin İncelenmesi. *Zeitschrift für die Welt der Türken-Journal of World of Turks*, 4(3), 15-30.

Tarı Cömert, I. ve Ögel, K. (2009). İstanbul örneğinde internet ve bilgisayar bağımlılığının yaygınlığı ve farklı etkenlerle ilişkisi. *Türkiye Klinikleri Adli Tıp Dergisi*, 6 (1), 9–16.

Üneri, Ö. Ş. ve Tanıdır, C. (2011). Bir grup lise öğrencisinde internet bağımlılığı değerlendirmesi: Kesitsel bir çalışma. *Düşünen Adam Psikiyatri ve Nörolojik Bilimler Dergisi*, 24 (4), 265–272.



The Role of Family Factor in Digital Game Addiction Among Children

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Abstract: We are living in an era of rapid transformation in technology due to continuous progress of computer and internet technologies. New media and new communication technologies have emphasized the phenomena of speed and digitalization has had a deep impact on almost every field. Today, digital games, as the extensions of digital technology, effect people of all ages and segments and different games with different qualities are commonly used. Along with the effects of globalization, digital games caused changes in life styles, standards of living and cultural activities. This has led to the birth of a new technological order; and at the same time, digital games provided a basis for the formation of a uniform culture. Game consoles, smart phones and games on the social media platforms influence the personal development of children deeply and are capable of causing changes in their perspective on life.

In addition to this, the economic structure of digital games should also be considered. There is a rapid growth in the digital games sector and the number of users of these games increased accordingly. The real progress began in the 1980's and by the 2000's, the impact of the sector have been felt profoundly on internet and virtual platforms. There is a linear supply-demand relationship in the digital game sector. This demand varies depending on the conditions. As they serve as means of recreation, escapism, entertainment and relaxation, the use of digital games increases continuously. There are a many reasons underneath this rapid increase. The overuse of digital games in an uncontrolled manner is called “digital game addiction”. Digital game addiction can be defined as playing games on game consoles, computers, smartphones, tablets etc. for long periods of time, to ignore daily tasks, to isolate oneself from society, or to be unable to fulfill ones duties and responsibilities.) Today, digital game addiction is seen as an ever increasing psychological issue. It is a threat especially to children as it effects the socialization process of children negatively. In the development of children, families are inarguably the most important factor. Family is the smallest unit of society. Children receive their first education from the family and are prepared for life within this family environment. Hence, family plays a big role in the life of a child. Therefore, this study aims to determine the role and effects of families in the use of digital games by children. As the method of the study the in-depth interview technique was used. Five different, open-ended questions were asked to thirty families and the answers were used to determine the situation. In addition to that, a detailed research was conducted on the subject matter and relevant discussions were included in the study. Families living in the Şişli District of Istanbul participated in the study and these families were selected through random sampling. The results of the study showed that family and



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environmental factors lead children to digital game addiction. Another important result was that families had a low level of knowledge about their children’s digital game addiction. It was determined that not only children, but also their families were interested in digital games and they played games particularly on their smartphones. It is a notable conclusion that children play digital games mostly for entertainment purposes and compromise their daily lives and studies for this reason. Digital game addiction not only effects the social life of children, but also directly effects their physical and emotional environment. Creating awareness in families, spending more time with children and receiving psychological help are among the steps that can be taken against digital game addiction. In addition to these, increasing the level of digital media literacy within society is another suggestion that can be made in order to prevent digital game addiction.

Keywords: Child, Digital Game, Addiction, Family, Digital Media Literacy

Introduction

Technology is the ability and knowledge required for the manufacturing or production of tools and devices matching human needs. Technology is the knowledge that involves all methods of production and of all the tools, equipment and devices used in those productions in any given industry. In terms of human activity, technology emerged before engineering and science in the history of humanity. As technology is used as the most effective form of data sharing, it is also a very efficient instrument in directing new discoveries. Today, technology is right in the midst of our lives. Technological advancements have profound influence on social life. Global life has penetrated into each and every segment of society. In our day, the information age companies control humans in every stage of their lives and force the use of informatics. Since it made life easier to use technological means such as computers, internet and telecommunications to meet their needs, people now expect all sectors and segments to provide these services. The emergence of Internet and Web 2.0, the rich contents provided by the non-profit organizations and end-users, led to important changes in reordering of the information sources and services.

Encoding of the audio, video and visual contents brought about the emergence of the digital media concept. With the encoding of the content, audio, video and visual inputs are transformed to media files. After that, they can easily be used, distributed, processed by the computers and transmitted. With the development of internet and computers, digital media has grown into a whole new world. Since both the media and the content change rapidly, people’s ways to communicate online change correspondingly. As a result, new interactive media platforms and social networks emerge. Digital media is the embodiment of this new formation. Whether it is to give a message for peace or to show differences in opinion, or to call for mass action or to defend personal opinions, every



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platform in which there is human expression, social interaction, communication and online education, is within the scope of digital media.

The playing and socialization habits of children have changed entirely due to reasons such as the fast progress of technology and the scarcity of play grounds. Traditional games were gradually replaced by digital games played on computers and the internet. It can be comfortably said that nowadays young people prefer digital games more than traditional games. Traditional games are natural tools that improve the social relations and mental capabilities of children. There has been many definitions given to describe the child – game relationship. Along with the ones who describe games as a means of entertainment, a mirror of the children’s psycho-social development and a tool through which children express themselves, there are explanations arguing that games are the ways through which children add meaning to their environment and learn how to exist in this environment. Gaming is a method for the child to learn things, things that cannot be taught by others, through his own experiences. Playing a game is the actions done without thinking about the consequences for the purpose of entertainment.

Since children spent more time in computer and internet environments, they are more interested in digital games. Often this goes as far as a level of addiction. The most important effect of digital games on the users is the psychological and physiological addiction. Digital game addiction is defined as the person’s overuse of computer or video games and inability to control this use, even though it causes social or emotional problems. The concept of digital game addiction stands for the emerging negative consequences rather than the time spend in the game. The relationship of mother, father and the other people in the family with the child determines the child’s place within the family. The attitudes towards the child have significant effects on the socialization of the child. In this study, it is aimed to determine the role and impact of family on the child’s use of digital games. The in-depth interview technique, which is one of the qualitative method of research, is used. Five different, open-ended questions were asked to thirty families and the answers obtained were used to determine the situation. The duties and responsibilities of families to increase the awareness of children’s digital game addiction were determined and in addition to that, the importance of digital media literacy in solving the problems was told.

Digital Game and Child Relationship

Today, when we think about the concepts of games and toys we should think of computer games, video games and mobile games played on portable devices thanks to the developing technology. “Video games”, “mobile games” and “computer games” can be used interchangeably, because in all three of them, data input is made via equipment such as joystick, keypad or keyboard while the display of the game is through the screen. On the basis of these commonalities, in this research, video, mobile and computer games are defined as “digital games” (Pala and Erdem, 2011: 54). Digital games become more widespread with the increasing use of smartphones.



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There is a strong bond between the child and game, because children are vastly interested in games. There is a lot of research about the relationship between the child and game in the literature. The effect of Vygotsky’s (as cited in Çankaya and Karamete, 2008: 117) on game research is more complex and widespread than that of Piaget. According to Vygotsky, game is always a social activity. Typically, game involves more than one child and the subjects, stories or the roles in the game reveal children’s interpretation of their society’s socio-cultural materials and their use of them with the purpose of the game. Therefore, even when a small child plays a game on his/her own, since this game’s subjects and parts express socio-cultural elements, Vygotsky thinks that this game is significantly social.

Today, while digital games are increasingly preferred by people from all age groups, it is also seen that they are used at early-childhood. The use of digital games at early childhood is through the introduction of the game by the adults around the child. It is understood from the service providers that the use of digital games is categorized based on age levels. When this age-based categories are observed, it is seen that the categories of digital games are lowered to age 1, however, the most extensive use is at the age of 5. It is stated that the responsibility of adults who take care of the children play a significant role in the level of use of digital games (Toran et al., 2016: 2265) Therefore, it is possible to say that parents also have a role in this regard. It appeals to more and more people for many reasons. First of all, games entertain the player, award the success, give the feeling of progress. Through the gameplay, the socialization needs of the person is fulfilled. Gameplay is a process to which the users actively participate instead of being passive users who just spend time and this process gives the satisfaction of success. In addition to this, games are differentiated for different segments, like for women, families and children. “Online” games played on Facebook and smartphones are preferred more within this context (Gürcan et al., 2008: 6)

Digital games have more negative effects than positive ones. They can be stated as follows (<http://www.guvenliweb.org.tr/dosya/wXK68.pdf/indir>, Access Date: 29.03.2018):

- The user is not able to control the time of gameplay.
- There is a loss of interest towards other activities.
- It is observed that the games with violent content are related to psychosocial problems such as loneliness, low satisfaction of life, aggression, depression, anxiety, tendency to violence, decrease in positive behavior, increase in hostile feelings, desensitization to violence.
- Games damage the improvement of social skills since they cause the person to move away from society.
- The person continues to play the game despite the negative consequences.
- The person feels psychological deprivation when he is not able to play the game.



General Look at Digital Game Addiction

It is very important to access information in the digital game sector. While some game developers defend that in order for the game to bring financial income, it should awake happy and positive feelings, many others care only about the entertaining content. On the other hand, while the relationship between digital games and addiction is tried to be explained with different psychological and behavioral research, the effects of violence element in digital games in creating addiction is another important subject that researchers study (Kuşay and Akbayır, 2015: 141). Digital game addiction is one of the major problems of our time. Griffiths stated that, no matter which terminology is used, overuse of digital games could lead to behavioral addiction. Lemmens and his friends defined digital game addiction as “excessive and compulsive use of computer or video games despite the social and/or emotional problems” (Irmak and Erdoğan, 2015: 11)

There are many agents prompting children to addiction in digital games. There is a chat section in almost all games. People playing the game have also the opportunity to chat with each other. In addition to that there are forums created for the players of many of the online games. Players communicate via these forums, exchange ideas about the tournaments they will hold, organize events, carry their friendships from virtual platform to real life. In this way, games are not just games anymore, but they are growing into environments where players socialize, chat, get new friends. There are pages of online games on the most popular social networking sites. Thousands of people follow and like these pages. In this way, players can communicate with each other via a different channel also. The necessity of research on online games increases even more within this context (Kaya, 2013: 74). Hence, the fact that digital games can create addiction came forth as a result of the research conducted.

It is thought that, since it involves internet addiction, cell phone addiction, social media addiction and digital game addiction, digital addiction, which gained an even more complex structure with integrated technologies, should be approached and researched as a whole. Several negations were reported about this digital addiction which has negative effects on daily life (Anderson, 2001: 21-26). Lemmes et al., (as cited in Hazar and Hazar, 2017: 206) discussed the digital game addiction under seven criteria, based on the addiction criteria on DSM IV. These criteria are;

1. Salience: Playing the game becomes the most important activity in the person’s life. The game is the dominating power of the person’s thinking (anxiety, worry), feeling (desire, craving) and behavior (excessive use).

2.Tolerance: The frequency and duration of gameplay are gradually increased.

3.Mood Modification: The person experiences the in-game entertainment personally and experiences a lot of moods on top level and as a result turns towards the game-behaviour in order to get rid of problems.



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4.Withdrawal: Unpleasant emotions and physical effects such as moodiness and irritability that occur during the gameplay.

5.Relapse: the person cannot control the excessive gameplay and repeatedly revert to gameplay behavior.

6.Conflict: As a result of excessive game play, the person experiences conflicts with others around him and in order to continue to play the game, lies to them.

7.Problems: The person starts to experience problems in his school, work and social life due to excessive gameplay.

There are a number of studies on digital game addiction. Chiu, Lee and Huang (2004) have developed a game addiction scale which consists of nine criteria in order to measure game addiction on children and adolescents. In this scale the criteria used was different than that of DSM. A two-factor scale, under the name of game addiction and game interest, in which these nine criteria explains 60% of the total variance with a reliability of 0.86 in a two-factor structure, was developed. There has also been some comprehensive studies done in Turkey. A research conducted by Horzum, Ayas and Çakır (2007) in Trabzon with 460 elementary level education students in order to develop a valid and reliable scale is among them. As a result of this research, they developed a scale with psychometric qualities within acceptable limits.

A Qualitative Study On the Observation of the Role of Family Factor on Digital Game Addiction among Children

Family, although it is the smallest human community consisting of mother, father and children, is the corner stone of society. From the moment of birth, the individual meets the family and communicates with the members of the family. Thus the socialization process starts, experiences and knowledge about life are acquired. The first stage of socialization takes place within the family. Especially, the family members' characters, behaviors and perspectives on life have direct effect on the child's development process. In this respect, the importance of family on child development is incontrovertibly profound (Kırık, 2014: 337) The first education takes place within the family before the school education. Mothers and fathers give the child information about life.

There is a strong bond between the family and the child. In addition to this, the parents have a very wide sphere of influence on the child. In a way, during the 0-6 age period, parents are both the closest people the child to meet all his needs and also the first teachers of him/her. Considering the fact that the development of the human personality is founded at the age of 0-6, the role of parents in the determination of the educational identity can be understood better. The status the child gains, the value he earns and the identity he develops within the family is the determinant of the identity, status and value he will obtain within the society in the coming years (Gordon, 1993). Therefore, the family has a significant and profound role in the digital game addiction among children.



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Family is thought to be quite an important factor in the prevention of digital game addiction. For this reason, this study is focused on this subject.

Method

In this study, the in-depth interview technique, which is a one of the qualitative research methods, is used. As a frequently used data gathering technique, the in-depth interview provides the opportunity for the interviewees to express themselves and for the researcher to be able to understand the interviewees' interpretation of their worlds, life perspectives, feelings, thoughts and experiences about the specific conditions they are in with the help of their own expressions. Therefore, it is a very useful method in order to determine the role of family in the prevention of digital game addiction among children (McCracken, 1998: 8). The in-depth interview has a special place within qualitative research and it is one of the most powerful techniques of it. The in-depth interview, is a data gathering technique which includes all dimensions of the research subject. Since the questions asked are usually open ended, it allows to receive detailed answers. The interviews are done face-to-face and one-to-one using the in-depth interview, feelings, thoughts, knowledge, experience and observations of the interviewee are obtained. The most important advantage of in-depth interview is that it allows for a flexible, rich and detailed data gathering. Thanks to this technique, data, which cannot be received otherwise, could be obtained. All interviewees are asked the same questions in the same order, however, they are allowed to answer the questions as extensively as they like (Berg, 1998)

Universe and Sampling: The universe of the study comprises of families living in the Şişli District of Istanbul. In the determination of the participants “purposeful sampling” was used. In purposeful sampling, the universe is divided into kindred areas. The group that could represent the subject matter of the researcher the best is selected among them. Hence, it is the families with children having digital game addiction problem that matters in the study., The sampling group of the study comprised of families that reside in the Şişli District of Istanbul with children going to elementary school at the age group of 7-11. However, due to the fact that the population of Şişli is above 270 thousand and the inability to reach all participants in the sampling group, random sampling is also used. Within the frame of the study, face-to-face in-depth interviews were made with 50 families and it was assumed that they gave correct answers to the questions.

Data gathering tools: In order to determine the attitudes and awareness of the families towards their children's digital game addiction, 5 different questions were prepared and these questions were asked them directly.



Findings and Commentary

Five questions that were asked to the participants were categorized and grouped based on specific criteria and transformed to quantitative data. The first question asked to families was "**Which digital environment your children prefer to play on primarily?**" More than half of the families (32) stated that their children play digital games on mobile communication devices (smartphone, tablet), which corresponds to 64% of the participants. Other answers were; computer games (9 – 18%), game consoles such as Playstation, Xbox .. etc. (6 – 12%), games on Facebook (2 – 4%) and online games on internet browser (1 – 2%).

The second question asked to the participants was to determine the time that children spent playing digital games, with the aim of learning the addiction level of children. The question asked was "**How many hours do your children play digital games per day?**" 10 families answered this question as "less than 1 hour", corresponding to 20% of the participants. 25 families stated that their children play 1-3 hours per day (50%), 9 families said 4-6 hours (18%) and 6 participants said 7 hours or more (12%). Considering the fact that children go to school during weekdays, it can be seen that the duration of children's digital gameplay is quite high.

The participants were asked "**Do you prohibit your children to play digital games or do you limit the time that they play? What is their attitude or how do they react when you limit or prohibit digital game playing?**" This question was asked with the aim of analyzing the attitude of children against the prohibition. The answers to this question were quite remarkable. 14 families (28%) stated that they prohibit playing games, 28 families (56%) said that they limit the time. 8 families (16%) said that they don't prohibit or limit the gameplay in anyway. Therefore, the reaction and attitude of the children of 42 families towards the prohibitions and limitations were tried to be determined. 13 of the families (26%) stated that the children behave aggressively, 11 of them (22%) stated that children become sad and cry, 10 of them (20%) stated that their children lock themselves in their rooms, 5 of them (10%) stated that their children don't eat food and 3 of them (6%) stated that their children keep their silence and accept the decision.

The fourth question asked was "**What do you say to your children or how do you behave in order to prevent them from playing digital games?**". Majority of the families (20-40%) answered this question by saying "I prohibit the devices on which he/she plays the game". Other answers were respectively 13 families (26%) "I say that it is unnecessary to play games", 11 families (22%) "I tell that playing games has negative effects on his/her studies", 4 families (8%) "I try to spend time with my child", 2 families (4%) "I ensure that he/she is busy with other activities".

The fifth and the last question asked to the participants was "**Do you think that your child is addicted to digital games? If so, what are the precautions you are taking?**". 40 families (80%) said that their children are addicted to digital games, 10 families



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(20%) said the opposite. In order to save their children from digital game addiction, 14 families (28%) said “I don’t / can’t take any precautions”, 12 families (24%) said “I request support from the teachers”, 6 families (12%) said “I play games with my child”, 5 families (10%) “I have him/her get psychological support” and 3 families (6%) said “I read informative articles, talk in this way”. What needs to be emphasized here is that the families are not completely knowledgeable with the subject matter.

Conclusion and Suggestions

Digital games are electronic games in which players interact via an interface. Digital games can be played online or offline, as a single player against the artificial intelligence or as multiplayer against each other or against the artificial intelligence. Especially beginning with the 1990’s, there has been a rapid growth in game industry. With the increasing consumption rate, new and different types of games were released into the market. Game industry gains acceleration with each day and expands its coverage area. Digital games are played mostly by children. Especially the games that are played with the purpose of entertainment, have profound effects on children and cause the addiction problem.

Digital game addiction is defined as a situation in which the person cannot stop playing games on devices like computer, telephone, tablet etc., for long periods of time, relates the game with real life, ignores the daily tasks and duties because of gameplay and prefers playing digital games over other activities. The studies shows that, the children who play digital games at the level of addiction and cannot stop playing, are shier, more fatalist and with less belief that they can control their lives compared to other children. As a consequence, their daily lives are deeply affected.

It is surely beyond doubt that the family has profound contributions on the development of a child, because family is the smallest unit of society. The child’s position within the family is determined particularly with the communication of the parents to the child. The attitude towards the child effects the child’s socialization process profoundly. In the same way, any change in the children’s habits of games and toys are effecting the families and cause significant changes in the attitudes and behaviors of families.

It was aimed to determine the role and the effect of families on the use of digital games among children and for this reason, five different questions were asked to fifty families living in the Şişli District of İstanbul. In this way, it was tried to be determined whether their children are addicted to digital games or not and also families’ attitudes and behaviors against this problem were examined. The research revealed that children play digital games mostly on mobile communication devices (smartphone, tablet). Families stated that their children spent 1-3 hours to play games. They said that, in order to prevent their children to be addicted to digital gameplay, they prohibit the use of the devices that their children use to play the games. It is quite remarkable that 20 of the families gave this answer. However, it does not seem quite possible to claim that addiction can be prevented through prohibitions. 40 of the families stated that their



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children are addicted to digital games. This is quite a high number. In this regard, it is possible to argue that digital game addiction is a major issue. Another remarkable conclusion is that families, in general, don't know how to fight against digital game addiction.

In conclusion, particularly with the use of mobile communication devices, digital game addiction has become widespread and might have profound impact on children's lives. To this point, first of all, the awareness of families about digital game addiction should be raised, because it depends on attitudes and behaviors of families for children to be saved from this addiction. It is very important to inform families about digital literacy. To this end local authorities can organize educational programs and seminars. Psychological support against digital game addiction is also suggested. It will also contribute to the solution of this problem for families to spend more time with their children and stay away from the digital world.

References

- Anderson, K. J. (2001). Internet Use Among College Students: An Exploratory Study. *Journal of American College Health*, 50, 21-26.
- Berg, B. L. (1998). *Qualitative Research Methods for The Social Sciences*. Boston: Allyn & Bacon.
- Chiu, S., Lee, J.Z., Huang, D.H. (2004). Video Game Addiction in Children and Teenagers in Taiwan. *Cyberpsychology & Behavior*. 7(5), 571–581.
- Çankaya, S., Karamete, A. (2008). Eğitsel Bilgisayar Oyunlarının Öğrencilerin Matematik Dersine Ve Eğitsel Bilgisayar Oyunlarına Yönelik Tutumlarına Etkisi. *Mersin University Faculty of Education Journal*, 4(2). 115-127.
- Gordon, T. (1993). *Etkili Öğretmenlik Eğitimi*. (translated by Emel Aksay, Birsen Özkan), İstanbul: YA-PA Publishing.
- Gürcan, A., Özhan, S., Uslu, R. (2008). *Dijital Oyunlar Ve Çocuklar Üzerindeki Etkileri*. Ankara: Prime Ministry Directorate General of Family and Social Surveys.
- Hazar, Z., Hazar, M. (2017). Çocuklar İçin Dijital Oyun Bağımlılığı Ölçeği. *Journal of Human Sciences*, 14(1), 203-216.
- Horzum, M., Ayas, T., Çakır-Balta, Ö. (2008). Çocuklar İçin Bilgisayar Oyun Bağımlılığı Ölçeği. *Turkish Psychological Counselling and Guidance Journal*, 3(30), 76– 85.
- Irmak, A. Y., Erdoğan, S. (2015). Validity And Reliability Of The Turkish Version Of The Digital Game Addiction Scale. *Anatolian Journal Of Psychiatry*, (16), 10-18.



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Kaya, A. B. (2013). ÇEVİRİMİÇİ OYUN BAĞIMLILIĞI ÖLÇEĞİNİN GELİŞTİRİLMESİ: GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI. Tokat: Gaziosmanpaşa University, Institute of Education Sciences, Master’s Thesis.

Kırık, A. M. (2014). Aile ve Çocuk İlişkisinde İnternetin Yeri: Nitel Bir Araştırma. Education and Training Studies Journal, 3(1), 337-347.

Kuşay, Y., Akbayır, Z. (2015). Dijital Oyunlar ile Tüketim Yolculuk: Öğrenme Yaklaşımı Açısından Çocuk Kullanıcılara Yönelik Bir Araştırma. Akdeniz Communication Journal (23), 135-154.

McCracken, G. (1988). The Long Interview, London: Sage Publications.

Pala, F. K., Erdem, M. (2015). Dijital Oyun Tercihi Ve Oyun Tercih Nedeni İle Cinsiyet, Sınıf Düzeyi Ve Öğrenme Stili Arasındaki İlişkiler Üzerine Bir Çalışma. Ahi Evran University Kırşehir Faculty of Education Journal, 12(2), 53-71.

Toran, M., Ulusoy, Z., Aydın, B., Deveci, T., Akbulut, A. (2016). Çocukların Dijital Oyun Kullanımına İlişkin Annelerin Görüşlerinin Değerlendirilmesi. Kastamonu Education Journal,, 24(5), 2263-2278.

“Dijital Oyunların Olumsuz Etkileri”,
<http://www.guvenliweb.org.tr/dosya/wXK68.pdf/indir>, Erişim Tarihi: 29.03.2018.



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Analysis of Game Types, Game Addiction Played by Secondary and High School Students Playing Digital Games

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Abstract

Digital game addiction is an important threat to society and individual health, which is now spreading rapidly between children and young people. Therefore, it is a requirement to determine the causes and related variables of this dependence in order to take preventive measures for digital game addiction. Thus, various studies were carried out and these studies need to be diversified. In this context, the aim of this study is to determine the playing behavior of secondary school and high school students playing digital games, and to investigate the relationship between the digital game play and the digital game addiction behaviors. In this context, relational screening method was used in this study. Personal information form and digital game addiction scale were used to determine participants' play habits, preferred game types and levels of digital game addiction. With these instruments, data were collected from 293 students, 96 of whom were secondary school students and 197 of them were high school students. In the analysis of the collected data, mean and standard deviation in the analysis of descriptive data, t-test in two-group comparisons and one-way ANOVA in multiple comparisons were used. According to the findings of the study, it was found that the participants in the secondary and high school level showed low digital game addiction. When the data obtained from sub-dimensions of the scale were analyzed, it was found that the participants in both groups showed a low level of dependency in malfunctions and economic profit factors and a moderate dependency behavior in the success factor. When the most frequently played digital games of the participants were examined, it was observed that high school students preferred more battle/adventure games, sports games and information/strategy games. Secondary school students preferred sports games and battle / adventure games. When the least preferred games are examined, it is understood that both high school and secondary school students play less than educational and dress up / make up games. According to the findings of the study, it was determined that daily play time had a significant effect on digital game addiction. Accordingly, the level of digital game dependence of the participants, who devote time to the game for 1-3 hours and 4-6 hours, was found to be significantly higher than those who played less than 1 hour. Accordingly, it can be said that the risk of digital gaming addiction increases as the time devoted to daily digital game play increases. When the level of game addiction was examined according to the most frequently played game type, it was found that the students who played "multi-user games" had a higher level of addictive behavior than the others. On the contrary, the participants who played the



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games in the "educational games" category had a lower level of game addiction than the participants who preferred the other game categories. According to the ANOVA comparison, participants who prefer multi-user games, battle / adventure games and sports games have been found to have higher levels of digital game addiction than those who prefer educational games.

Introduction

The game is a natural tool that allows the development of various skills that affect social relationships and interactions of children (Sahin & Tugrul, 2012). Games are very important activities for child development (Mehmet Baris Horzum, 2011). Especially in K-12, it can be said that plays game a vital role in children's sociocultural, mental, psychological and biological development. Nowadays, games have been moved from digital media to physical media. Thanks to its constantly evolving features, the number of users of digital games is increasing day by day. With the rapid development of computer and network technologies, digital games are considered as the mainstream recreation activity between computer and internet users (Kim & Haridakis, 2009). The virtual world presented in digital gaming environments has become the second life of children. Therefore, digital games reach the level of dependency among children and young people in particular (Çakır, Ayas, & Horzum, 2011; Sahin & Tugrul, 2012). This intensive use leads to game addictions. Digital game addiction can be expressed as the individual's inability to control the game-playing behavior (Kim & Haridakis, 2009), to think about the game and to play continuously (Mehmet Baris Horzum, 2011; Mehmet Baris Horzum, Tuncay, & Balta, 2008). In addition, users who have access to digital games at all times are in constant interaction with other users. At this point, determining the gaming behavior of children and the level of digital game addiction will provide important data at the point of preventing children's addiction on digital games.

Purpose

The purpose of this research is to determine the gaming behaviors of middle school and high school students playing digital games and to play digital games (educational games, sports, simulation, strategy, online multi-user, battle / addiction behaviors). For this purpose, the following questions were asked:

1. What are the levels of digital game addiction for students?
2. What is the most popular type of digital game?
3. Does the duration of daily digital gaming affect the level of gaming addiction?



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4. Will the type of digital game played most often affect the level of game addiction?

Method

The present study was designed with relational screening method. A personal information form and a digital gaming addiction scale were used to determine participant gaming habits, the types of games they play, and their digital gaming addiction. In line with the aim of the study, in the spring semester of 2017-2018, a secondary school attached to the Ministry of National Education and 293 students studying in various high schools were implemented. The study group for the application was selected from the students who play digital games.

In this study, personal information form and online game addiction scale were used. Game addiction scale was developed by Başol and Kaya (2016). The game addiction scale consists of three sub-dimensions (9 items in malfunctions factor, 8 items in success factor and 4 items in economic profits factor) and 21 items. In the analysis of the quantitative data obtained in the study, t test and one way ANOVA were used. Analysis of the data was made using the SPSS program.

Findings

The Levels of Digital Game Addiction

Table 1 presents the statistical data on the scores of the game addiction scale and the scale sub-dimensions of secondary and high school students.

Table 1. Level of game addiction for middle and high school students

Cinsiyet	N	Alt boyutlar	X	Sd
		Game Addiction	2.38	.90
Secondary School	96	Economic Profit	1.87	1.13
		Success	3.35	1.18
		Malfunctions	1.75	1.04
		Bağımlılık	2.29	.94
High School	197	Economic Profit	1.66	1.03
		Success	3.11	1.22
		Malfunctions	1.84	1.02

When the game addiction behaviors were examined, it was found that the participant showed low game addiction ($X_{\text{secondary}} = 2.38$, $X_{\text{highschool}} = 2.29$) according to the scores obtained from the general scale (See. Table 1). Participants were found to exhibit moderate addictive behaviors at a low level of success ($X_{\text{secondary}} = 1.75$, $X_{\text{highschool}} = 1.84$) and economic profit ($X_{\text{secondary}} = 1.87$, $X_{\text{highschool}} = 1.84$) and at moderate level of success ($X_{\text{secondary}} = 3.36$; $X_{\text{highschool}} = 3.11$) when they were analyzed from the perspective of sub-dimensions.

The Most Popular Type of Digital Game

The distributions of the most frequently played digital games of participants at the high school and secondary school level are presented in Figure 1.

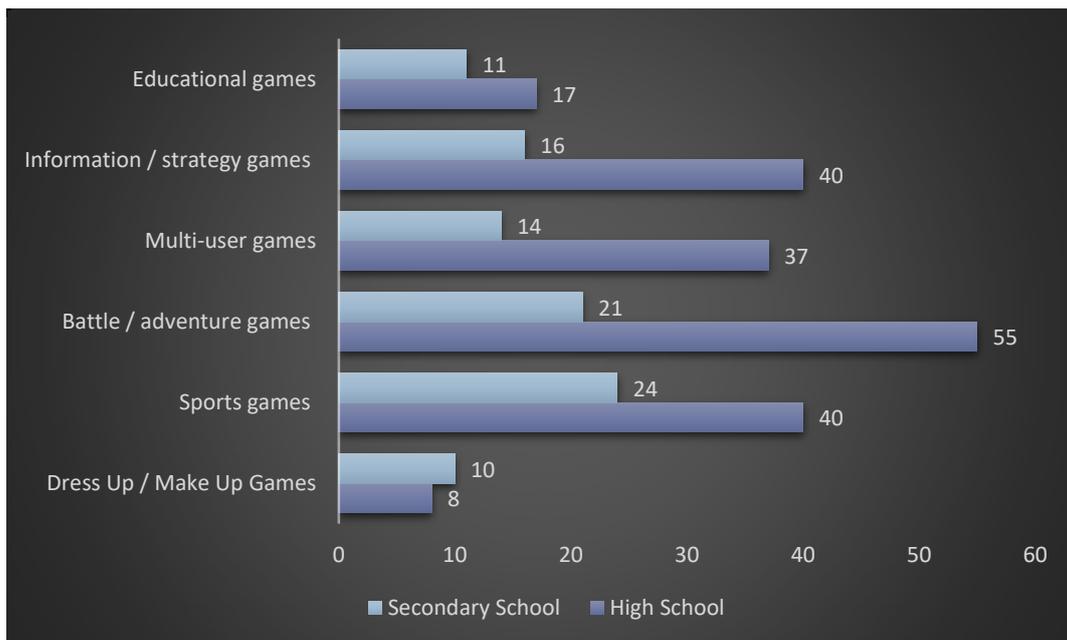


Figure 1. Most played digital game type

Participants of secondary school were most likely to prefer sports games (football, car racing, etc.) ($f = 24$) and battle / adventure games ($f = 21$). Participants of high school were most likely to prefer battle / adventure games ($f = 55$), sports games (football, car racing, etc.) ($f = 40$) and information / strategy games ($f = 40$).

Does the duration of daily digital gaming affect the level of gaming addiction?

In order to determine the effect of daily playing times on digital game dependence, single factor ANAVO test was applied. The findings are presented in Table 2.

Table 2. According to the duration of daily play, the level of game addiction is the single-factor ANOVA comparison

	Source of variance	Sum of squares	of df	Squares average	F	p
Malfunctions	Between Groups	75,443	2	37,722	46,914	,000
	Within Groups	233,180	290	,804		
	Total	308,623	292			
Success	Between Groups	52,316	2	26,158	20,178	,000
	Within Groups	375,939	290	1,296		
	Total	428,255	292			
Economic Profit	Between Groups	55,714	2	27,857	29,203	,000
	Within Groups	276,630	290	,954		
	Total	332,343	292			
Game Addiction	Between Groups	61,369	2	30,684	46,976	,000
	Within Groups	189,426	290	,653		
	Total	250,795	292			

According to the Table 2, comparison of the level of game addiction according to the duration of the daily play, the duration of playing has a significant effect on the game addiction ($F(2, 290) = 46.98, p < .01$). The Scheffe test was applied to determine which groups the resulting effect is between, and it was determined that the gaming addiction level was significantly higher than the gaming group less than 1 hour per day for 1-3 hours and 4-6 hours per day. The Scheffe test was applied to determine which groups the resulting effect is between, and it was determined that as the duration of daily play



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increases, the level of gaming addiction is significantly increased (less than 1 hours >1-3 and 4-6 hours per day, 1-3 hours per day > 4-6 hours per day).

Will the type of digital game played most often affect the level of game addiction?

Table 3 shows the single-factor ANOVA findings related to the comparison of game addiction levels according to the type of digital play that students play most frequently.

Table 3. Game addiction level single-factor ANOVA compared to the type of digital play that students play most frequently

	Source variance	ofSum of squares	ofdf	Squares average	F	p
Malfunctions	Between Groups	26,896	5	5,379	5,480	,000
	Within Groups	281,727	287	,982		
	Total	308,623	292			
Success	Between Groups	61,504	5	12,301	9,626	,000
	Within Groups	366,751	287	1,278		
	Total	428,255	292			
Economic Profit	Between Groups	16,585	5	3,317	3,015	,011
	Within Groups	315,758	287	1,100		
	Total	332,343	292			
Game Addiction	Between Groups	34,960	5	6,992	9,298	,000
	Within Groups	215,834	287	,752		
	Total	250,795	292			

When the level of game addiction was examined according to the most frequently played game type, it was found that the students who played "multi-user games" had a higher level of addictive behavior than the others. On the contrary, the participants who played the games in the "educational games" category had a lower level of game addiction than the participants who preferred the other game categories. A one-way ANOVA was used



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to determine whether the most common type of game play influenced the level of gaming addiction (See. Table 3). According to ANOVA result, there was a significant difference between the level of gaming addiction according to the preferred game type ($F(5,287) = 9.30, p <.05$). The Scheffe test was conducted to determine which groups the differences between the groups were between, and it was found that groups that prefer multi-user games, battle / adventure games and sports games have higher level of game addiction than those who play educational games. Also, it was found that the groups that prefer multi-user games and battle / adventure games have higher level of game addiction than those who play information / strategy games.

Conclusion

The conclusions of this study, in which the effects of secondary and high school students' gaming preferences and behaviors on gaming addiction levels are examined, can be summarized as follows:

- Given the participants' level of gaming addiction, it was determined that high and secondary school students participating in the study had low level of gaming addiction behavior. On the other hand, the achievement subscale of the scale was reached, and the result that high and secondary school students exhibited moderate game addiction.
- According to the results of the study, it was determined that high school students preferred the most battle / adventure games and secondary school students preferred the most sports and battle / adventure games.
- As the amount of time devoted to daily digital games increases, the level of game addiction has increased.
- According to the findings of the study, participants who prefer multi-user games have higher levels of game addiction than other participants. However, it was determined that participants who preferred educational games had lower levels of game addiction than the other participants.
- It is concluded that groups that prefer multi-user , battle/ adventure and sports games have higher level of game addiction than those who play educational games. Also, it is determined that the groups that prefer multi-user and battle/ adventure games have higher level of game addiction than those who play information / strategy games.

References



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Başol, G., & Kaya, A. B. (2016). Motives and Consequences of Online Game Addiction: A Scale Development Study. *Archives of Neuropsychiatry*, 55(3), 225.

Çakır, Ö., Ayas, T., & Horzum, M. B. (2011). An investigation of university students' internet and game addiction with respect to several variables. *Ankara University Journal of Faculty of Educational Sciences*, 44(2), 95-117.

Horzum, M. B. (2011). Examining computer game addiction level of primary school students in terms of different variables. *Eğitim ve Bilim*, 36(159), 56.

Horzum, M. B., Tuncay, A., & Balta, Ö. Ç. (2008). Computer game addiction scale for children. *Turkish Journal of Psychological Counseling and Guidance*, 3(30), 76-88.

Kim, J., & Haridakis, P. M. (2009). The role of internet user characteristics and motives in explaining three dimensions of internet addiction. *Journal of Computer-Mediated Communication*, 14(4), 988-1015.

Sahin, C., & Tugrul, V. M. (2012). Defining the levels of computer game addiction of the primary school students. *Zeitschrift für die Welt der Türken/Journal of World of Turks*, 4, 115-130.

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Investigation of Video Game Playing Habits and Addiction Levels of Secondary School Students

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Abstarct

Aim: Because of the rapid progress of technology and the widespread use of the internet, the frequency of playing video games which have sub-types such as console games, personal computer games and online games in the virtual environment has increased in recent years especially among children and teenagers. The purpose of this study is to investigate the frequency and variety of video game playing, its effect on daily activities and responsibilities, the levels of addiction on video games in secondary school students and determine the attitudes of their parents in this area.

Material and Methods: Our study was designed as a cross-sectional descriptive study. The study which was carried out between January 15, 2018 and February 15, 2018, included students from four secondary schools in different sociodemographic characteristics. A structured questionnaire was applied to the parents who agreed to participate in the survey. 'Videogame Addiction Scale for Children' was applied to children playing video games.

Results: Of the 311 students who participated in the study, 14 were excluded because they had a chronic illness. The mean age of 297 children (\pm SD) was $11,8 \pm 1,0$ years and 46,5% of them were male students. 82,5% (n = 245) of the students, 91,3% of the boys and 74,8% of the girls were playing video games (p <0.001). The age at which they started playing video game was similar for male and female students ($7,5 \pm 2,1$ years, $7,6 \pm 2,0$ years; p = 0,520, respectively). 11,8% of children playing video games had a game console. The mean score of addiction scale for children playing video games was $47,6 \pm 15,3$, while it was significantly higher in males ($52,7 \pm 15,7$) than females ($42,2 \pm 12,8$) (p <0.001). Children with gaming consoles had a higher score than those of their peers ($53,5 \pm 16,2$, $46,8 \pm 15,0$, p = 0.026). Playing with multi-player had higher scores on addiction ($50,7 \pm 15,5$, $45,9 \pm 15,0$, p = 0.018, respectively). The average score of VASC of online gamers was higher than those does not played online ($52,3 \pm 17,6$, $45,2 \pm 13,4$, p = 0.002). Those who played intelligence games had lower scores on VASC than their peers ($41,8 \pm 16,4$, $48,5 \pm 15,0$, p = 0.020, respectively). The scores of those who play war games were significantly higher than those who did not play it ($54,8 \pm 16,3$, $45,6 \pm 14,4$, p <0.001, respectively). The educational status of the mother (> 8 and \leq 8 years), the educational status of the father (> 8 and \leq 8 years), the place of residence, the birth order of the child (1 and >1), the status of sibling, and status of parents playing games did not



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affect the VASC score. When children's ages were controlled and analyzed, there was a negative correlation between the age of starting video game and the score of VASC in males ($r = -0.224$, $p = 0.012$) but not in girls. It was determined that 4 students whose VASC scores were above 90, have video game addiction.

Conclusion: According to our results, it is determined that the habit of playing video games in children is high and boys are playing more than girls. It has been shown that intelligence games are protected from addiction, as opposed to the fact that the risk of addiction to video games is higher in children who play online games and war games.

Keywords: Video game, Addiction, Online, War Game

Introduction

Video games are popular entertainment source among children and adolescents. Both video games and their results are increasing all around the world (1). Video game applications have reached both individual and social effects and have become a new method of entertainment with the inclusion of thinking, feeling and acting (2).

Parallel to the spread of video games, their effects on children and young people has begun to be questioned (3). Many studies on video games have attempted to define excessive use of video games and game addiction and to understand the differences between these two features (4). No matter what terminology is used, researchers agree on the overuse of computer and video games can lead to a behavioral addiction (5). Characteristics of the addictive behavior are extreme, compulsive, uncontrollable and psychologically or physically destructive. According to this definition, video game addiction is defined as excessive and compulsive use of computer and video game result in social and / or emotional problems and can not be controlled by the gamer even the excessive use leads to these problems (6). ‘Internet Gaming Disorder’ has been added as a temporary illness to the last edition (fifth edition) Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (7). For Turkish Children; Horzum at al. (8) developed the ‘Computer game addiction scales for children’ and Yılmaz at al. (9) developed the ‘Video game addiction scales for children’ based on the fact that video games can be played not only with computers but also with mobile phones, tablets and game consoles.

Because of the rapid progress of technology and the widespread use of the internet, the frequency of playing video games which have sub-types such as console games, personal computer games and online games in the virtual environment has increased in recent years especially among children and teenagers (10). The purpose of this study is to investigate the frequency and variety of video game playing and the levels of addiction on video games in secondary school students.



Material and Methods

Our study was designed as a cross-sectional descriptive study. The study which was carried out between January 15, 2018 and February 15, 2018, included students from four secondary schools in Afyonkarahisar Province with different sociodemographic characteristics. Permission to carry out the study was approved by Afyon Kocatepe University's Clinical Research Ethics Committee (No: 2018 / 1-14 dated 01.05.2018). A structured questionnaire was applied to the parents who agreed to participate in the survey. 'Videogame Addiction Scale for Children (9)' was applied to children playing video games. The VASC is a measure of 21 items. It consists of a likert type scoring scale, and only one of each of the items is marked 'none = 1, rarely = 2, sometimes = 3, generally = 4, always = 5'. The total score for each child is obtained by summing all scores and is in the range of 21 to 105. Students with a scale score above 90 were considered as video game addicts.

Descriptive statistics for the whole sample were generated as follows: frequency for categorical variables and mean and standard deviation for continuous variables. Chi-square test and Fisher's exact test were used to compare the percent distributions of categorical data between groups. In order to compare the averages between the groups, the normal distribution of the data was evaluated by the Shapiro Wilk test. In the *independent* groups; when means' *distributions* were normal, Independent Groups T Test was used and when means' distributions were not normal, Mann Whitney U and Kruskal Wallis tests were used to compare. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) 21.0 package program. Values of $P < 0.05$ were considered statistically significant.

Results

Of the 311 students who participated in the study, 14 were excluded because they had a chronic illness. The mean age of 297 children (\pm SD) was $11,8 \pm 1,0$ years and 46,5% of them were male students. 82.5% ($n = 245$) of the students, 91.3% of the boys and 74.8% of the girls were playing video games ($p < 0.001$). The age at which they started playing video game was similar for male and female students ($7,5 \pm 2,1$ years, $7,6 \pm 2,0$ years; $p = 0,520$, respectively). 11.8% of children playing video games had a game console.

The VASC scores for children were divided into 9 groups according to Sturges Rule (Figure-1). The mean score of addiction scale for children playing video games was 47.6 ± 15.3 , while it was significantly higher in males (52.7 ± 15.7) than females (42.2 ± 12.8) ($p < 0.001$). Children with gaming consoles had a higher score than those of their peers (53.5 ± 16.2 , 46.8 ± 15.0 , $p = 0.026$). Playing with multi-player had higher scores on addiction (50.7 ± 15.5 , 45.9 ± 15.0 , $p = 0.018$, respectively).

The average score of VASC of online gamers was higher than those does not played online (52.3 ± 17.6 , 45.2 ± 13.4 , $p = 0.002$). Those who played intelligence games had lower scores on VASC than their peers (41.8 ± 16.4 , 48.5 ± 15.0 , $p = 0.020$, respectively).



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The scores of those who play war games were significantly higher than those who did not play it (54.8 ± 16.3 , 45.6 ± 14.4 , $p < 0.001$, respectively).

The educational status of the mother (> 8 and ≤ 8 years), the educational status of the father (> 8 and ≤ 8 years), the place of residence, the birth order of the child (1 and > 1), the status of sibling, and status of parents playing games did not affect the VASC score. When children's ages were controlled and analyzed, there was a negative correlation between the age of starting video game and the score of VASC in males ($r = -0.224$, $p = 0.012$) but not in girls. It was determined that 4 students whose VASC scores were above 90, have video game addiction.

Discussion

The frequency of playing video games in adolescents was found in very high rates in MOST current published researches. In their study, Tejeiro Salguero et al. (11) found that 93% of 207 adolescents played video games within the past year and 50% of them plays regularly, at least once a week. Allahverdipour et al. (12) found that more than 93% of adolescents play video games in Iran; Lenhart et al. (13) found 72% of the adolescents playing video games in their study from Spain. A study from Netherlands showed that 95% of male adolescents and 81% of girl adolescents play video games (14). In 2016, Pontes et al. (15) found a frequency of playing video games as 82.1% in a multi-center study involving 1071 adolescents in Slovenia. We also found a similar frequency of playing video games as 82.5% in our study. These results show that the habit of playing video games among adolescents is quite common all around the world, and a large frequency of adolescent is at risk of the possible ADVERSE effects of this widespread habit.

According to literature, it is known that boys play video games more frequently than girls (14). Lenhart et al. (13) found that 50.9% of boys and 49.1% of girls play video games. In our study, we also found that the frequency of playing video games was 51.4% in males and 48.6% in females. We showed that the frequency of boys playing video games was significantly higher than girls ($p < 0.001$).

In studies investigating addiction on playing video games, addiction was shown to be higher in males compared to females (16,9,6). Griffiths has also shown that males significantly play video games more regularly, start playing earlier and play more war games (17).

In our study, we also found that video game addiction scale mean score of boys' was significantly higher than girls' ($p < 0.001$). In a study of adults, Michelle has SHOWN that the part of the BRAIN that generates rewarding feelings is MORE ACTIVATED in men than women during VIDEO-GAME play (18).

Allahverdipour et al. (12) found that the rate of playing war and violent games were 47%. In our study, action-adventure and strategy games were found as the most frequently played games with 26.5% among eight game types. Despite the frequent



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playing of action-adventure and strategy games, there was no significant relationship with the level of addiction score. A statistically significant relationship was found between war games and video game addiction.

Conclusion

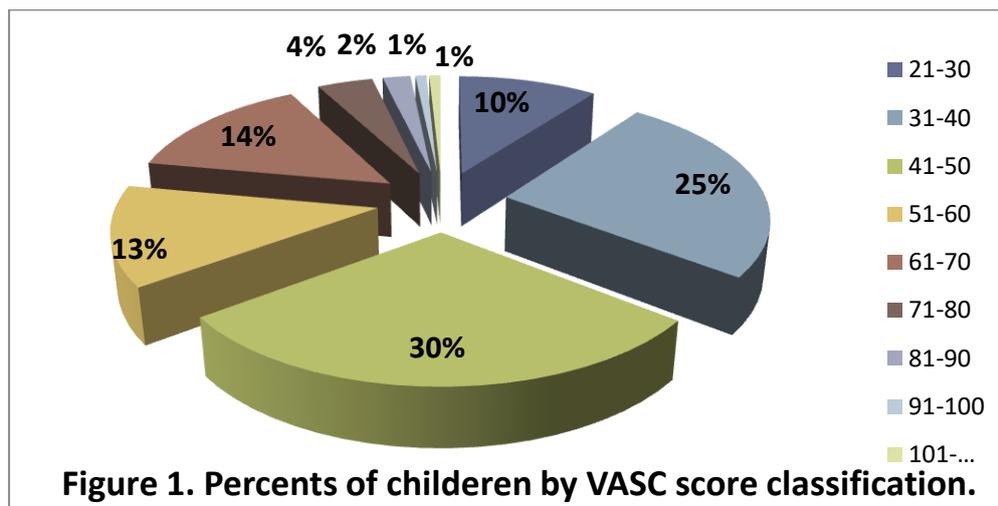
According to our results, it is determined that the habit of playing video games in children is high and boys are playing more than girls. It has been shown that intelligence games are protected from addiction, as opposed to the fact that the risk of addiction to video games is higher in children who play online games and war games.

Keywords: Video game, Addiction, Online, War Game

References

1. Kuss, D. J. (2013). Internet gaming addiction: current perspectives. *Psychology research and behavior management*, 6, 125.
2. Lemos, I. L., Abreu, C. N. d., & Sougey, E. B. (2014). Internet and video game addictions: a cognitive behavioral approach. *Archives of Clinical Psychiatry (São Paulo)*, 41(3), 82-88.
3. Ferguson, C. J. (2007). The good, the bad and the ugly: A meta-analytic review of positive and negative effects of violent video games. *Psychiatric Quarterly*, 78(4), 309-316.
4. Saquib, N., Saquib, J., Wahid, A., Ahmed, A. A., Dhuhayr, H. E., Zaghoul, M. S., Al-Mazrou, A. (2017). Video game addiction and psychological distress among expatriate adolescents in Saudi Arabia. *Addictive Behaviors Reports*, 6, 112-117.
5. Griffiths, M. D., & Davies, M. N. (2005). Videogame addiction: does it exist?
6. Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2009). Development and validation of a game addiction scale for adolescents. *Media Psychology*, 12(1), 77-95.
7. Association, A. P. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*: American Psychiatric Pub.
8. Horzum, M., Ayas, T., & Cakir-Balta, Ö. (2008). Computer game addiction scale for children. *Turkish Psychological Counseling and Guidance Journal*, 3(30), 77-88
9. Yilmaz, E., Griffiths, M. D., & Kan, A. (2017). Development and Validation of Videogame Addiction Scale for Children (VASC). *International journal of mental health and addiction*, 15(4), 869-882.

10. Akçay, D., & Özcebe, H. (2012). Okul öncesi eğitim alan çocukların ve ailelerinin bilgisayar oyunu oynama alışkanlıklarının değerlendirilmesi. *Çocuk Dergisi*, 12(2), 66-71.
11. Tejeiro Salguero, R. A., & Morán, R. M. B. (2002). Measuring problem video game playing in adolescents. *Addiction*, 97(12), 1601-1606.
12. Allahverdipour, H., Bazargan, M., Farhadinasab, A., & Moeini, B. (2010). Correlates of video games playing among adolescents in an Islamic country. *BMC public health*, 10(1), 286.
13. Lenhart, A., Smith, A., Anderson, M., Duggan, M., & Perrin, A. (2015). Teens, Technology and Friendships. Pew Research Center, August. In.
14. The Netherlands National Gamers Survey; 2009. http://www.newzoo.com/press/TodaysGamers_SummaryReport_NL.pdf. Accessed December 6, 2010.
15. Pontes, H. M., Macur, M., & Griffiths, M. D. (2016). Internet gaming disorder among Slovenian primary schoolchildren: Findings from a nationally representative sample of adolescents. *Journal of Behavioral Addictions*, 5(2), 304-310.
17. Griffiths, M. (1997). Computer game playing in early adolescence. *Youth & Society*, 29(2), 223-237.
18. Michell, B. (2008) Video Games Active Reward Regions of Brains in Men More Than Women. Stanford Study Finds. Stanford Med website.





Use Of Information Communication Technology By Children Aged 3-7 Years And The Factors Affecting It

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Abstract:

Introduction: The rate of use of today's childrens' information communication technologies (ICT: television, smartphone, computer, tablet) is expanding. Particularly with smart phones and touch screen technologies, children begin to use ICT from their early ages on. Whether this condition is beneficial or harmful in terms of child health is still controversial. It can be said that there are two different ideas in this issue. The first one of these ideas is that technology is necessary and useful for children, and that children should meet technological tools from an early age. Another view is that children ought to be acquainted with the technological tools as late as possible because these tools can cause physical and mental problems. At this point it is important how and for what purpose technological devices are used. Our aim in this study is to determine the prevalence of ICT use among children between 3-7 years and to examine parents' attitudes and factors that affect the children's ICT use.

Materials and Methods: The study was conducted on the data collected from the mothers of children aged 3-7 years. Data collected from 100 mothers were presented as preliminary results of our study. The information was collected through a questionnaire consisting of 35 questions prepared by the researchers. The questionnaires were applied to the mothers who referred to Cumhuriyet University Hospital Pediatrics Polyclinic. In the analysis of the data, t test, Mann Whitney U test and chi-square test were used. 49 of children (49 %) were girls and 51 (51%) were boys. The average age of children was 5.9 ± 1.2 years (36-94 months). 15% of mothers and 9% of fathers were primary / secondary school graduates while 85% of mothers and 91% of fathers were high school / college graduates. 92% of the families live in the city center. 37% of the mothers were housewives. 13% of the families have a monthly income of less than 2000 TL, while 32% were between 2000-5000 TL and 55% were more than 5000 TL. The families have an average of 2.08 ± 0.7 (1-5) children. Children watch television (TV) approximately 115.2 ± 77.9 minutes on weekdays and on average 156.0 ± 80.6 minutes on weekends. Using smartphones, computers and tablet (SPCT) except for TV for children are an average of 68.4 ± 62.8 minutes on weekdays and 101.4 ± 77.4 minutes on weekends. The parents spend an average of 96.9 ± 26.2 minutes per day as an individual with their children. Children watch on TV mostly cartoon (89%), kids films (70%) and TV series (25%). 33% of children watch the inappropriate programs for their ages 1-2 times a week on TV. The aims of use SPCT for children often are to play and watch the



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cartoons or videos. Seventeen percent of children play violent games in SPCT. 43% of the families stated that they had strict rules on SPCT and 57% stated that they did not enforce any rules or enforce the rules. 43% of families use ICT as a punishment or a reward most often for food and study. There was no significant difference between girls and boys in terms of TV and SPCT monitoring time. In families where parents were high school or college graduates, weekday TV watching and weekday ATBT use of children were found to be significantly lower than those whose parents' have graduated from primary / secondary school. (respectively 105.2 ± 71.6 versus 172.0 ± 89.6 $p < 0.05$, 62.1 ± 53.8 versus 104.0 ± 96.1 $p < 0.05$). Children of working mothers watch TV on weekdays and weekends significantly shorter than the children of housewife mothers. (respectively, weekdays: 93.80 ± 63.9 versus 151.6 ± 86.6 minutes; $p < 0.05$, weekend: 138.6 ± 77.2 versus 185.7 ± 78.4 minutes; $p < 0.05$). Children whose parents are primary / secondary school graduates play 3 times more violent games than those whose parents are high school / college graduates. While paternal education is not effective on the rules of the SPCT, as the mother education increases, there are clearer rules in this respect. In a similar way, while the education of the father is not effective in monitoring the violent programs of the child, the children in the families where the mother is a primary / secondary school graduate are watching 2.46 times more violent programs. When parents spend more than 2 hours per day on TV and SPCT, the duration of children's weekday and weekend SPCT use also significantly increases. 82% of the parents think that ICT is harmful, and 35% say that ICT causes mental and physical health problems in children. **Conclusion:** According to our study, children aged 3-7 years use ICT more than 2 hours a day. The most important factor affecting the length of time children spend on the screen is the level of education of their parents. In this regard, appropriate programs should be chosen adapted to child's age and children should be followed up on ICT within certain rules.

Key words: Children Aged 3-7 Years, Information Communication Technology

Introduction:

The rate of use of today's childrens' information communication technologies (ICT: television, smartphone, computer, tablet) is expanding. Particularly with smart phones and touch screen technologies, children begin to use ICT from their early ages on (1). Whether this condition is beneficial or harmful in terms of child health is still controversial. It can be said that there are two different ideas in this issue. The first one of these ideas is that technology is necessary and useful for children, and that children should meet technological tools from an early age. Another view is that children ought to be acquainted with the technological tools as late as possible because these tools can



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cause physical and mental problems (2, 3). At this point it is important how and for what purpose technological devices are used.

Our aim in this study is to determine the prevalence of ICT use among children between 3-7 years and to examine parents' attitudes and factors that affect the children's ICT use.

Materials and Methods:

The study was conducted on the data collected from the mothers of children aged 3-7 years. Data collected from 100 mothers were presented as preliminary results of our study. The information was collected through a questionnaire consisting of 35 questions prepared by the researchers. The questionnaires were applied to the mothers who referred to Cumhuriyet University Hospital Pediatrics Polyclinic. In the analysis of the data, t test, Mann Whitney U test and chi-square test were used. 49 of children (49 %) were girls and 51 (51%) were boys. The average age of children was 5.9 ± 1.2 years (36-94 months). 15% of mothers and 9% of fathers were primary / secondary school graduates while 85% of mothers and 91% of fathers were high school / college graduates. 92% of the families live in the city center. 37% of the mothers were housewives. 13% of the families have a monthly income of less than 2000 TL, while 32% were between 2000-5000 TL and 55% were more than 5000 TL. The families have an average of 2.08 ± 0.7 (1 - 5) children. 99% of the families have television at home, 95% have a smart phone, 68% have tablets, 58% have a laptop and 26% have a computer. 40% of the children have their own tablet or computer, 4% have a TV in the room. While 40% of the houses had TV in the kitchen, 31% stated that the TV was open while eating. Children watch television (TV) approximately 115.2 ± 77.9 minutes on weekdays and on average 156.0 ± 80.6 minutes on weekends. Using smartphones, computers and tablet (SPCT) except for TV for children are an average of 68.4 ± 62.8 minutes on weekdays and 101.4 ± 77.4 minutes on weekends. The parents spend an average of 96.9 ± 26.2 minutes per day as an individual with their children. Children watch on TV mostly cartoon (89%), kids films (70%) and TV series (25%). 33% of children watch the inappropriate programs for their ages 1-2 times a week on TV. The aims of use SPCT for children often are to play and watch the cartoons or videos. Seventeen percent of children play violent games in SPCT. 43% of the families stated that they had strict rules on SPCT and 57% stated that they did not enforce any rules or enforce the rules. 8% of children play 1-2 times a week, 4% play 3-4 times a week, 5% play violent games every day. 43% of families use ICT as a punishment or a reward most often for food and study. There was no significant difference between girls and boys in terms of TV and SPCT monitoring time. In families where parents were high school or college graduates, weekday TV watching and weekday SPCT use of children were found to be significantly lower than those whose parents' have graduated from primary/secondary school. (respectively 105.2 ± 71.6 versus 172.0 ± 89.6 $p < 0.05$, 62.1 ± 53.8 versus

104.0±96.1 p<0.05). Children of working mothers watch TV on weekdays and weekends significantly shorter than the children of housewife mothers. (respectively, weekdays: 93.80±63.9 versus 151.6±86.6 minutes; p<0.05, weekend: 138.6±77.2 versus 185.7±78.4 minutes; p<0.05) (Table 1). Children whose parents are primary/secondary school graduates play 3 times more violent games than those whose parents are high school/college graduates. While paternal education is not effective on the rules of the SPCT, as the mother education increases, there are clearer rules in this respect. In a similar way, while the education of the father is not effective in monitoring the violent programs of the child, the children in the families where the mother is a primary/secondary school graduate are watching 2.46 times more violent programs. 56% of the families stated that the use of ICT did not affect the daily life of their children. However, 26% stated that ICT use caused the child's sleepiness, 26% had daily routines, 23% had trouble with meal times and 20% had social problems. When parents spend more than 2 hours per day on TV and SPCT, the duration of children's weekday and weekend SPCT use also significantly increases. 82% of the parents think that ICT is harmful, and 35% say that ICT causes mental and physical health problems in children. The problems the parents have mentioned are often asociality, stubbornness and irritability in the child, tendency to violence, lack of attention, dependence on technological tools, and spinal-eye problems.

Table 1: Factors affecting the use of ICT

	Weekday daily SPCT time (minute)	Weekend daily SPCT time (minute)	Weekday daily TV time (minute)	Weekend daily TV time (minute)	Time spent with the child (minute)
Gender of the child					
Girl	58.2±54.9	88.8±74.3	110.2±76.8	149.4±76.1	100.2±25.7
Boy	78.2±68.7	113.5±79.2	120.0±79.4	162.3±84.9	93.7±26.6
r	0.08	0.102	0.55	0.46	0.142
Mother's job					
Housewife	78.6±79.8	106.2±84.4	151.6±86.6	185.7±78.4	103.8±21.1
Working	62.4±50.0	98.6±73.6	93.8±63.9	138.6±77.2	92.8±28.2
r	0.543	0.587	0.001	0.006	0.058
Monthly income					
< 5000 TL	83.3±80.1	94.7±79.6	142.0±82.7	162.7±80.0	103.6±23.7
> 5000 TL	56.2±40.8	106.9±75.9	93.3±66.7	150.5±81.3	91.4±27.1
r	0.135	0.135	0.002	0.469	0.009
Mother education					
Primary/secondary	104.0±96.1	110.0±89.8	172.0±89.6	186.0±82.7	102.0±96.1
High school/university	62.1±53.8	99.9±75.5	105.2±71.6	150.7±79.5	96.0±27.4
r	0.017	0.643	0.002	0.11	0.417
Father education					
Primary/secondary	126.7±118.8	120.0±106.0	190.0±82.1	196.7±83.7	104.4±21.8
High school/university	62.6±52.1	99.6±74.5	107.8±73.9	151.9±79.6	96.1±26.6
r	0.165	0.453	0.002	0.113	0.368
Mother's ICT time					
< 2 hours/day	61.1±55.1	92.3±74.1	110.5±76.0	149.6±79.3	96.2±27.2
> 2 hours/day	95.7±81.9	135.7±82.0	132.9±84.1	180.0±82.7	99.3±22.7
r	0.046	0.022	0.24	0.125	0.609
Father's ICT time					
< 2 hours/day	59.0±48.8	86.7±66.2	112.8±79.6	147.1±79.7	98.6±26.1
> 2 hours/day	84.3±79.6	126.5±88.9	119.1±75.6	171.1±80.9	94.0±26.6
r	0.147	0.014	0.69	0.152	0.409

ICT: Television, smartphone, computer, tablet
 SPCT: Smartphone, computer, tablet



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Discussion:

It was not found any studies in Turkey, about the preschool children's that how long average use devices such as TV, tablets, smartphones and computer. According to the study of Turkey Statistical Agency made between 6-15 years, use of computer and internet starts respectively 8 and 9 years old in Turkey. It was reported that 24.4% of the children in this age have their own computer (4). In our study, although the age range is 3-7 years, the proportion of children with have their own computer is 40%. Different results are obtained in different studies with the use of ICT. Sanders et al. stated that 99.5% of children aged between 3-7 years have at least one screen (TV, smart phone, computer, tablet or video game) in USA (5). In our study, similarly, 99% of families have at least one display device. Sanders et al. reported that the boys ages of 3-7 years spent 8 hours and the girls of the same age spent 7 hours a week across the screen (5). Studies conducted in our country have shown that Turkish children spend more time across the screen. Konca et al. stated that their study that made on kindergarten students, children spent an average of 115 minutes on TV and 28 minutes on computer a day (6). In the study by Genç 37.6% of preschool children use 2 hours on TV and nearly one hour on smartphones on weekdays. In the same study it was stated that 41.2% of the same children use 3-4 hours on TV and 58.8% of them about one hour on smartphone on weekend (7). Akçay and Özcebe found that children aged 4-6 years played computer games for about half an hour on weekdays and about 1.5 hours on weekends (8). In our study, the weekly TV watching times of female and male children between 3-7 years were 110 and 120 minutes respectively and the weekend TV watching times were 149 and 162 minutes respectively. The same children according to their gender, 'girls and boys' spend respectively 58 and 78 minutes on TV on weekdays and 88 and 113 minutes on TV on weekends. These results are similar to the studies in our country. However, in our study, there was no significant difference between the sex of the child and the time spent on the screen.

The American Academy of Pediatrics (AAP) recommends that 18-month-old children should not be introduced to the screen, and that between 18-24 months, parents should watch short-term high-quality programs with their children. At the same time, the AAP recommends that children aged 2-5 years should not exceed 1 hour of daily screen time (9). Similar to the results of our study, Asplund and colleagues found that children aged 0-5 years spent longer time on the screen than recommended (10). According to the results of our study, the level of education of the parents, the working status of the mother, the monthly income level of the parents and the duration of the parents' use of the ICT are influential on the ICT use of the children. In the study of Akçay and Özcebe, parents' playing computer significantly increases the child's computer playing (8). One of the notable findings in our study is the effect of parental education level on the monitoring of the child's violent programs. When the parents are high school/college



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graduates, children's violence-related program monitoring is reduced by 3 times. While father's education is not effective in the implementation of the rules in the ICT context, 1.6 times more strict rules apply to the use of ICT in high school/college graduated mothers. While in our study, the rate of use of ICT as punishment or reward was 43%, the same proportion was determined as 61% in another study in our country on kindergarten students (1). In our study, 82% of the mothers indicated that they think the BIT is harmful, while in the case of Kaya's study, this rate is similarly 84% (1).

Conclusion:

According to our study, children aged 3-7 years use ICT more than 2 hours a day. The most important factor affecting the length of time children spend on the screen is the level of education of their parents. In this regard, appropriate programs should be chosen adapted to child's age and children should be followed up on ICT within certain rules.

References:

1. Kaya,İ.(2017). The Relationship Between Parents' Approach Toward Their Children's Using Information And Communication Technologies (Ict) And Children's Habits Of Using These Technologies. Turkish Studies, International Periodical for the Languages, Literature and History of Turkish or Turkic, 12/18, 173-186.
2. Plowman, L., & McPake, J. (2013). Seven myths about young children and technology. *Childhood Education*, 89(1), 27-33.
3. Plowman, L., McPake, J. and Stephen, C. (2010). The technologisation of childhood? Young children and technologies at home. *Children and Society*, 24(1), 63–74.
4. Türkiye İstatistik Kurumu (TÜİK) (2013) 06-15 Yaş Grubu Çocuklarda Bilişim Teknolojileri Kullanımı ve Medya. <http://www.tuik.gov.tr/PreHaberBultenleri.do?id=15866>. Date of access: 07.11.2018.
5. Sanders, W., Parent, J., Forehand, R., Sullivan, A. D., & Jones, D. J. (2016). Parental perceptions of technology and technology-focused parenting: Associations with youth screen time. *Journal of applied developmental psychology*, 44, 28-38.
6. Konca, A.S. (2014) Anaokulu öğrencilerinin bilgi ve iletişim teknolojileri kullanımı. Unpublished post graduate thesis. İnönü University, Institute of Educational Sciences.
7. Genc, Z. (2014). Parents' perceptions about the mobile technology use of preschool aged children. *Procedia-Social and Behavioral Sciences*, 146, 55-60.



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8. Akçay, D., & Özcebe, H. (2012). okul öncesi eğitim alan çocukların ve ailelerinin bilgisayar oyunu oynama alışkanlıklarının değerlendirilmesi. Çocuk Dergisi, 12(2), 66-71.
9. American Academy of Pediatrics (2016) American academy of pediatrics announces new recommendation for children’s media use. <https://www.aap.org/en-us/about-the-aap/aap-press-room/pages/american-academy-of-pediatrics-announces-new-recommendations-for-childrens-media-use.aspx>
10. Asplund, K. M., Kair, L. R., Arain, Y. H., Cervantes, M., Oreskovic, N. M., & Zuckerman, K. E. (2015). Early childhood screen time and parental attitudes toward child television viewing in a low-income Latino population attending the special supplemental nutrition program for women, infants, and children. Childhood Obesity, 11(5), 590-599.



Awareness Of Digital Media Use Of Parents Who Have Children In Pre-School Period

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Introduction And Aim: The parent is the individual who protects and guides the child in any environment that allows a child to be physically, emotionally, and socially. It is also the parents' responsibility to guide children in the early childhood period who are not yet literate in the use of rapidly developing and changing digital media. This study aimed to assess parents' awareness of the use of digital media by their children in preschool period.

Metod: A questionnaire consisting of 20 questions evaluating some sociodemographic features and digital media usage was applied to 124 parents who have children aged 4-6 in a kindergarten in Ankara.

Results: All mothers and fathers who have accepted to participate in the research have graduated from higher education and have no income below the poverty line. The average age of the mothers is 32.7 years, the fathers is 36.7 years. Half of the children were 5 years old, 42% were 4 years old and the ratio of girls / boys was similar. All of the children and their parents are reported to be use digital media, and what tools they use and how often they are used are shown in Table 1.

38.4% of the children and 23.2% of the parents were playing digital games. It is stated that the parents spend most of their time playing games with their children, the second most often they watch television. While parents do not do daily sports activities with their children, the duration of digital gaming together is 9.6 minutes / day. When parents are asked to rate their concerns about their children, such as health, safety, nutrition, sleep, and self-help; most often they stated that their children are concerned about health and safety, and at least they are concerned about their intellectual skills. The use of digital media is scored similarly to the social environment and effective communication skills.

92% parents indicated that digital media posed a problem between parents (eg time lost, stealing from each other, violation of family duty sharing). However, 94.4% of parents stated that the digital media facilitated their lives because the child spent time on their own. Half of the parents said their children could not set a limit on the timing of digital media use. All parents stated that digital media had risks, and 72.8% stated that they are not aware of the safety of children in the digital environment



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Table 1. Frequency of children and their parents using digital media

Digital media tool	hour/day
Television	
Child	2,29±1,9
Parent	3,37±1,15
Phone	
Child	1,48±0,51
Parent	4,76±0,96
i-pad	
Child	1,47±0,40
Parent	-
Computer	
Child	0,15±0,36
Parent	2,18±1,54

Conclusion:

Parents play an important role in supporting the healthy living, protection of risks and psychosocial development in the community. Children internalize and implement what they learned from their parents by taking role models. Nowadays, digital media is developing very fast and it is very difficult to keep up with this development. Parents wondered when their children were outside the home, for example, playing with their friends on the street, and nowadays they worry when their children are at home. Parents are required to know and use digital media better than their children so that they can guide their children in the virtual world outside the real world.

In our study, it is seen that all families and children with high socioeconomic level and educational level use different areas of digital media. Families are aware of digital media, but their knowledge and attitudes about the risks posed by the digital media are not enough. In this regard, programs should be developed to guide wider studies and families to identify needs. The implementation of these programs can increase the parents' digital literacy and enable children to use digital media effectively and safely.



Exposure To And Use Of Mobile Devices In Children Aged 1-60 Months

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Abstract

Aim: The use of mobile media devices has become very common in childhood. There are no particular pediatric guidelines for the use of mobile devices, although such use is not recommended before the age of 24 months. For children aged ≥ 24 months there is a need for warnings and precautions to avoid their potential harmful effects. The present study aimed to determine the frequency of mobile device use, and the purposes of such use in children aged 1-60 months, and to detect the relationship between the frequency of mobile device use and family socioeconomic status. In addition, the study sought to determine which devices play an important part in the life of children, so as to make well-informed suggestions about children's use of such devices to families, health service providers, and society at large. To the best of our knowledge, the present study is the first in our country and one of the rare studies in literature to examine the use of mobile devices in children aged 1-60 months.

Materials and methods: The study included 422 parents that presented with children aged 1-60 months to the pediatric outpatient clinics at Dr. Sami Ulus Maternity and Children's Health and Diseases Training and Research Hospital, Ankara, Turkey, between 01 June 2016 and 01 August 2016. Parents whose children had neuromotor retardation were excluded from the study. A questionnaire with 21 items adapted from earlier studies was administered to the parents via face-to-face interview. Mobile devices were divided into 3 categories (cellphones, tablets, and computers). Monthly income was categorized as below or above the national poverty threshold (1777 Turkish liras, or approximately \$500).

Results: In all, 50.2% of their children were female ($n = 212$). Among the children, 24.4% ($n = 103$) had never used a mobile device, and among the children that had used a mobile device 20.6% ($n = 66$) were aged 1-12 months, 24.5% ($n = 78$) were aged 13-24 months, 18.2% ($n = 58$) were aged 25-36 months, 21.3% ($n = 68$) were aged 37-48 months, and 15.4% ($n = 49$) were aged 49-60 months. The youngest child that used a mobile device was 6 months old. The median age at first-time use of a mobile device was 12 months.



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Among the 422 children, 15.9% (n = 67) had a tablet in their room, 0.7% (n = 3) had a computer in their room, 0.7% (n = 3) had a cellphone in their room, and 1.6% (n = 7) had both a tablet and computer in their room. The most commonly owned device among mobile devices was tablets with a frequency of 83.7%. The frequency of using a tablet increased significantly after age 25 months ($P < 0.001$). In total, 25.7% (n = 82) of the children that used mobile devices used multiple devices simultaneously (media multitasking).

The frequency of tablet use significantly decreased as the parental level of education increased ($P < 0.01$); this was strongly correlated with the mother’s level of education ($P < 0.01$).

The most frequent activity the children used mobile devices for was watching videos (70.8%, n = 226), followed by playing games (56.7%, n = 181), use of other applications (28.5%, n = 91), watching television (16.6%, n = 53), and reading books (1.2%, n = 4).

The parents reported that 38.6% (n = 123) of the children usually received help when using mobile devices, 21.6% (n = 69) received help sometimes, 17.6% (n = 56) rarely received help, and 22.3% (n = 71) never received help. As the age of the children increased the frequency of receiving help using mobile devices decreased ($P < 0.01$)

In total, 59.6% (n = 190) of parents gave their children permission to use mobile devices while they (parents) are doing daily tasks, 28.8% (n = 92) let their children use mobile devices while the family is visiting others’ homes and shopping, and when parents use their own mobile devices or leave the home. Among the parents, 91.5% (n = 386) had never been informed by a doctor about the effects of their children’s exposure to mobile devices.

Conclusion: Although it is recommended not to use mobile devices in children under twenty- four months and limited and controlled use in children older than twenty-four months, uncontrolled and independent mobile device use regardless of income level was detected in our study even in children less than twenty-four months. Parents should be trained by health care providers to make children have conscious and beneficial interactions with mobile media devices.

Keywords: Child, mobile media devices, tablets, smartphones, tutorial application

Introduction

Mobile phones and other similar mobile devices play an increasingly important role in the rapidly changing and developing information technology sector.¹ Use of mobile devices is a contemporary factor affecting human behavior.² Exposure to mobile devices affects infants and children to a greater degree than children aged ≥ 6 years. There are no particular pediatric guidelines for the use of mobile devices, although such use is not



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recommended before the age of 24 months. For children aged ≥ 6 years there is a need for warnings and precautions to avoid their potential harmful effects.³

According to the WHO, good health results from a combination of psychological, physical, and social wellbeing. Currently, data available on the effects of mobile device usage on the health of children and infants are insufficient.⁴

The present study aimed to determine the frequency of mobile device use, and the purposes of such use in children aged 1-60 months, and to detect the relationship between the frequency of mobile device use and family socioeconomic status. In addition, the study sought to determine which devices play an important part in the life of children, so as to make well-informed suggestions about children’s use of such devices to families, health service providers, and society at large. To the best of our knowledge, the present study is the first in our country and one of the rare studies in literature to examine the use of mobile devices in children aged 1-60 months.

Patients and Method

The study included 422 parents that presented with children aged 1-60 months to the pediatric outpatient clinics at Dr. Sami Ulus Maternity and Children's Health and Diseases Training and Research Hospital, Ankara, Turkey, between 01 June 2016 and 01 August 2016. Informed consent was obtained and institutional review board approved the study. Parents whose children had neuromotor retardation were excluded from the study. A study-specific questionnaire with items adapted from earlier studies^{1,5} was administered to the parents (Table 1) via face-to-face interview conducted by Dr. A.O.K. The parents were not given any assistance answering the questionnaire items.

Mobile devices were divided into 3 categories (cellphones, tablets, and computers). Data were collected on the age and gender of the children, parental level of education, household monthly income, and to be owner of mobile devices. Monthly income was categorized as below or above the national poverty threshold (1777 Turkish liras, or approximately \$500). The age at which the children first used mobile devices was determined, as was how the children used mobile devices, which was based on answers to questionnaire items related to watching television, watching videos, playing games.

Additionally, the questionnaire included items related to children’s simultaneous use of multiple mobile devices, how the use mobile device affected family time, whether or not mobile devices were kept in the children’s rooms, whether or not the children received help while using mobile devices, and whether or not the parents had been informed by a doctor about the effects of their children’s exposure to mobile devices. The questionnaire also collected data regarding in which circumstances parents permitted their children to use mobile devices (during daily works, while visiting others’ homes, to



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keep children calm when parents were out of the home or using their own mobile devices) and the frequency of use (usually, sometimes, rarely, and never).

Data were analyzed using IBM SPSS Statistics for Windows, v.20 (IBM Corp., Armonk, NY). Quantitative data are expressed as mean \pm SD and median (range), and categorical data are shown as frequency and percentage. Categorical variables were compared using the chi-square test. The level of statistical significance was set at $P < 0.05$.

Results

The questionnaire was administered to 422 parents. In all, 50.2% of their children were female ($n = 212$) and 49.8% were male ($n = 210$). Parental demographic and socioeconomic findings are shown in Table 2. Among the children, 24.4% ($n = 103$) had never used a mobile device, and among the children that had used a mobile device 20.6% ($n = 66$) were aged 1-12 months, 24.5% ($n = 78$) were aged 13-24 months, 18.2% ($n = 58$) were aged 25-36 months, 21.3% ($n = 68$) were aged 37-48 months, and 15.4% ($n = 49$) were aged 49-60 months. The youngest child that used a mobile device was 6 months old. The median age at first-time use of a mobile device was 12 months. The frequency of using a tablet increased significantly after age 25 months ($P < 0.001$) (Table 3). In total, 25.7% ($n = 82$) of the children that used mobile devices used multiple devices simultaneously (media multitasking).

Among the 422 children, 15.9% ($n = 67$) had a tablet in their room, 0.7% ($n = 3$) had a computer in their room, 0.7% ($n = 3$) had a cellphone in their room, and 1.6% ($n = 7$) had both a tablet and computer in their room. The frequency of tablet use significantly decreased as the parental level of education increased ($P < 0.01$); this was strongly correlated with the mother's level of education ($P < 0.01$) (Table 3). The parents reported that 38.6% ($n = 123$) of the children usually received help when using mobile devices, 21.6% ($n = 69$) received help sometimes, 17.6% ($n = 56$) rarely received help, and 22.3% ($n = 71$) never received help. As the age of the children increased the frequency of receiving help using mobile devices decreased ($P < 0.01$) (Table 3).

The most frequent activity the children used mobile devices for was watching videos (70.8%, $n = 226$), followed by playing games (56.7%, $n = 181$), use of other applications (28.5%, $n = 91$), watching television (16.6%, $n = 53$), and reading books (1.2%, $n = 4$) (Table 4). In total, 59.6% ($n = 190$) of parents gave their children permission to use mobile devices while they (parents) are doing daily tasks, 28.8% ($n = 92$) let their children use mobile devices while the family is visiting others' homes and shopping, and when parents use their own mobile devices or leave the home (Table 4). Among the parents, 91.5% ($n = 386$) had never been informed by a doctor about the effects of their children's exposure to mobile devices.



Discussion

The American Academy of Pediatrics (AAP) recommends that children not use mobile media devices before age 24 months and recommends restricted access after age 24 months.^{6,7} In the present study 45% of children began using mobile devices before age 24 months and median age at first-time use of mobile devices was 12 months. Furthermore, 1 child had access to a mobile device at age 6 months. Parents in the present study introduced mobile devices to their children at early ages. Kabali et al.¹ reported that 92% of children aged 6 months to 4 years had access to mobile devices in 2015, versus 10% in 2011 and 38% in 2013 among children aged ≤ 24 months, according to Rideout et al.⁵ These data show that the frequency of mobile device use increase even at a very young age despite intercommunal differences.

In the present study 16% of children used tablets, as compared to 20% in 2013 (5) and 36.2% in 2015.¹ The difference between the frequency of tablet use in the present and in Kabali et al.'s ¹ study might be due to the differences in socioeconomic and cultural conditions. Mobile devices became available later in Turkey than in the West. Moreover, the fact that mobile devices are less expensive in the West than in Turkey may have affected this result. In the present study the frequency of families that let their children use tablets decreased as socioeconomic status increased, which indicates that as parental level of education increases supervision of children's access to mobile devices increases.

In the present study approximately 25% of the children were reported to simultaneously use multiple mobile devices (media multitasking), whereas Kabali et al.¹ reported this as 33%. According to AAP, simultaneous use of multiple mobile devices by children is associated lack of attention, decrease in participating activities, daily works and school performance.⁷ The parents in the present study reported that 41.3% of the children aged 1-24 months never or rarely received help while using mobile devices, which we find troubling, as AAP and other researchers recommend no use of mobile devices by children aged < 24 months.^{2,4,7,8}

Another important finding of the present study is that children most frequently used mobile devices for watching videos. Kabali et al.¹ reported that 76% of children watched videos on mobile devices. Rideout et al.⁵ observed that 47% of older children watched videos and 63% played games on mobile devices. It is likely that children of school age prefer playing games to watching videos on mobile devices and that among children aged < 6 years the passive activity of watching videos may be preferred to active game play, as the motor capabilities in young children are not sufficiently developed for them to enjoy digital gameplay.⁹ Playing games with peers is fundamental to neurodevelopment.¹⁰ As with watching television, the passive activity of watching videos on mobile devices may have a profoundly negative effect on brain development



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during the preschool period in which vital neurodevelopmental milestones need to be achieved.¹¹⁻¹³

The most frequent reason the parents in the present study permitted their children to use mobile devices was to keep them occupied while they (parents) were performing daily tasks or domestic chores. Parental inability to adequately supervise children while performing such tasks and chores can lead to exposure to unsuitable content and excessive duration of use.

Reduced parent-child interaction due to a child’s use of mobile devices can also negatively affect a child’s development.⁹ Most of the parents in the present study replied negatively to the questionnaire item, “Do you let your children use mobile devices while you are using mobile devices in order to prevent them from distracting you?”, whereas a remarkable number of parents answered the same question positively in a study from the US.¹ Our finding may be coherent with the overprotective behavior patterns of Turkish family.¹⁴

The restrictions about mobile device access must be placed on children regarding when and where mobile devices can be used, including content and duration; however, the educational potential of mobile devices should not overlooked.⁷ Parental use of mobile media devices together with their children (co-viewing), which may be a beneficial way of monitoring and preventing children from accessing unsuitable content.⁸

Families must be educated about how to improve the quality time spent using mobile devices, how to minimize the negative effects of such use, and how to improve the beneficial effects of such use.⁸ In the present study 91.5% of the parents reported that they had not been informed by a doctor about their children’s use of mobile devices, which indicates that physician awareness about this issue must be improved. Pediatricians and family doctors must be provided with in-service training about the costs and benefits of mobile devices, and encouraged to educate parents.

Conclusion

The present findings show that children’s use of mobile devices must be considered in the context of public health. It is essential that children learn how to effectively use mobile devices, so that their mobile device experiences benefit their social, cognitive, and emotional development. Attempts to increase women’s educational level may be targeted first to reach this goal.

References

1. [Kabali, H.K., Irigoyen, M.M., Nunez-Davis R,](#) et al. (2015). Exposure and Use of Mobile Media Devices by Young Children. *Pediatrics*, 136, 1044-1050.



International Child and Information Safety Congress
“Digital Games”
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FULL TEXT BOOKLET

2. [Hinkley, T., Verbestel, V., Ahrens, W., et al. \(2014\). IDEFICS Consortium. Early Childhood Electronic Media Use as a Predictor of Poorer Well-being: a prospective cohort study. *JAMA Pediatr*, 168, 485-492.](#)
3. Radesky, J.S., Schumacher, J., Zuckerman, B., (2015). Mobile and Interactive Media Use by Young Children: The good, the bad, and the unknown. *Pediatrics*, 135, 1-3.
4. Radesky, J.S., Christakis, D.A. (2016). Increased Screen Time: Implications for early childhood development and behavior. *Pediatr Clin North Am.*, 63, 827-39.
5. Rideout, V., Saphir, M., Pai, S., Rudd, A. (2013) Zero to eight: Children’s media use in America 2013. Common Sense Media. Available at: <https://www.commonsensemedia.org/research/zero-to-eight-childrens-media-use-in-america-2013>
6. [Anderson, C.A., Bushman, B.J. \(2001\). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: a meta-analytic review of the scientific literature. *Psychol Sci.*, 12, 353-9.](#)
7. [Strasburger, V.C., Hogan, M.J., Mulligan, D.A., et al. \(2013\). Council on communications and media. Children, adolescents, and the media. *Pediatrics*, 132, 958-961.](#)
8. Gentile, D.A., Reimer, R.A., Nathanson, A.I., Walsh, D.A., Eisenmann, J.C. (2014). Protective effects of parental monitoring of children's media use: a prospective study. *JAMA Pediatr.*, 168, 479-484.
9. [Radesky, J., Christakis, D., Hill, D., et al. \(2016\). Council on communications and media. Media and Young Minds. *Pediatrics*, 138, e20162591.](#)
10. [Ginsburg, K.R. \(2007\). American Academy of Pediatrics Committee on Communications; American Academy of Pediatrics Committee on Psychosocial Aspects of Child and Family Health. The Importance of play in promoting healthy child development and maintaining strong parent-child bonds. *Pediatrics*, 119, 182-91.](#)
11. [Jordan, A.B., Hersey, J.C., McDivitt, J.A., Heitzler CD. \(2006\). Reducing children's television-viewing time: a qualitative study of parents and their Children. *Pediatrics*. 118, e1303-10.](#)
12. [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 Dev.* 80, 1350-9.](#)



International Child and Information Safety Congress
“Digital Games”
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13. [LeBourgeois, M.K.](#), [Hale, L.](#), [Chang, A.M.](#), [Akacem, L.D.](#), [Montgomery-Downs, H.E.](#), Buxton, O.M. Digital media and sleep in childhood and adolescence. *Pediatrics*. **140**, S92-S96.
14. The research of family values in Turkey. Ankara 2010. TR Prime Ministry Directofrequency General of Family and Social Research, pp 171-173,

Table legends

Table 1: Questionnaire

Table 2: Sociodemographic data

Table 3: Features of mobile media usage

Table 4: Circumstances in which parents let their children use mobile media device

Table 1: Questionnaire

Open-ended questions

- What is your child’s age?
- Age at first use of mobile media devices?
- Monthly household income?

Yes-no questions (Media exposure)

- Smartphone
- Computer
- Tablet

Multiple choice questions

- Parental Educational levels
- Circumstances in which parents let their children use mobile media device
- Whether the children had mobile media devices in their own rooms
- In which activities children participated on mobile media devices
- Whether the children received any help while using mobile media devices
- Whether the children used multiple mobile devices simultaneously
- Whether the parents had been informed about this subject by a doctor or not

Table 2: Sociodemographic data

	(n)	(%)
Sex/gender		
Female	212	50.2 (212/422)
Male	210	49.8 (210/422)
Age of children (month)		
1-12	121	28.7 (121/422)
13-24	111	26.3 (111/422)
25-36	65	15.4 (65/422)
37-48	74	17.5 (74/422)
49-60	51	12.1 (51/422)
Maternal educational level		
Illiterate	6	1.4 (5/422)
Primary school	168	39.8 (168/422)
High School	156	37 (156/422)
Education of high school	75	17.8 (75/422)
University and beyond	17	4 (17/422)
Paternal educational level		
Illiterate	5	1.2 (5/422)
Primary school	136	32.2 (136/422)
High School	173	41 (173/422)
Education of high school	86	20.4 (86/422)
University and beyond	22	5.2 (22/422)
Monthly income		
Below the national poverty	213	50.5 (213/422)
Above the national poverty	209	49.5 (209/422)

Table 3: Features of mobile media usage

Child ability with mobile media device	n	%
Almost	123	38.5 (123/319)
Sometimes	69	21.6 (69/319)
Rare	56	17.6 (56/319)
Never	71	22.3 (71/319)
Activities with media devices*	n	%
Watching videos	226	70.8 (226/319)
Playing gamea	181	56.7 (181/319)
Uing other applications	91	28.5 (91/319)
Watching TV	53	16.6 (53/319)
Reading books	4	1.2 (4/319)
Mobile media exposure	n	%
1-12 months	66	20.6 (66/319)
13-24 months	78	24.5 (78/319)
25-36 months	58	18.2 (58/319)
37-48 months	68	21.3 (68/319)
49-60 months	49	15.4 (49/319)

* More than one option can be choosed

Table 4: Circumstances in which parents let their children use mobile media device

Activity	n	%
During daily tasks		
Almost	40	12.6 (40/319)
Sometimes	90	28.2 (90/319)
Rare	60	18.8 (60/319)
Never	129	40.4 (129/319)
During home visits		
Almost	17	5.2 (17/319)
Sometimes	45	14.1 (45/319)
Rare	30	9.4 (30/319)
Never	227	71.2 (227/319)
During house keeping		
Almost	34	10.7 (34/319)
Sometimes	76	23.8 (76/319)
Rare	43	13.5 (43/319)
Never	166	52 (166/319)
Public places		
Almost	13	4.1 (13/319)
Sometimes	43	13.5 (43/319)
Rare	35	10.9 (35/319)
Never	228	71.5 (228/319)
when their parents were out of the home or using smart devices		
Almost	6	1.9 (6/319)
Sometimes	25	7.8 (25/319)
Rare	27	8.5 (27/319)
Never	261	81.8 (261/319)



Internet Security of the Children of Parents Employed in Health Sector and Their Information, Attitudes and Behaviours towards Digital Games

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Introduction

Today the internet has come to be an important means of meeting one's daily needs of every sort as a result of the rapid developments in computer, internet and digital games as well as the economic sector regarding them (Günlü & Ceyhan, 2017). Individuals use the facilities offered by the internet today for most of their shopping, needs, habits or behaviours. Parallel to the global case, the use of the internet has become common and widespread in Turkey, as well. According to the results of TUIK's (Turkish Statistics Institution) Survey for the Use of Information Technologies within the Family in 2012, 8 out of 10 families have an access to the internet and also while the rate of access to the internet was 47.2% then, it rose to 66.8% in 2017 (TÜİK, 2017). According to the TUIK's survey on the 16-74 age group people in 2014, the use of internet was found to be the highest (73%) in the age group of 16-24 (TÜİK, 2014). Viewed from this perspective, social concerns are generated by the fact that especially the children and the young are densely interested in this technology and that they very much outpace the adults in a short time (1). Such reasons as non-planned urbanization, insufficiency of the fields for children, parents' preference to keep their children in the eye control within the house due to the child abuse and neglect have increased the children's interest in digital games and changed their habits of playing and socialization.

Turkish Language Institution (TDK) defines the game as a means of entertainment with certain rules for having a good time that improves ability, skill and intelligence and the toy as a means of game (Bekmezci, Atatürk, Sağlık, & Fakültesi, n.d.). With the developed technology, traditional games and toys have come to be replaced by the digital games on the internet today, especially in cities. However, the debate as to whether digital games are useful or harmful to children and adolescents is on the increase in the world and in our country. The studies in recent years have attempted to shed light on this issue. The common view in these studies is that the content of the game is of importance (Yılmaz, Griffiths, & Kan, n.d.).

There are a lot of studies showing that playing digital games enhances visual skills and concentration, contributes to quick decision-making and strategy-developing, and develops their social skills. There are also some studies that show that digital games can help develop the learning skills and spatial abilities of the children with autism, attention-deficit disorder and disabilities (MD, 2002). On the other hand, there are a lot



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of studies to reveal that these games not only cause depression, anxiety, uninterrupted worry, inappetency, sleeping disorder and neglect of physical activities among the children but also cause them to isolate themselves from their friends and family into a solitary/isolated virtual world (Yilmaz et al., n.d.). The studies have demonstrated a relationship between the children’s gender, age and parents’ education levels and the time they spend playing digital games (Pe N, n.d.). It has been found that male children spend more time playing digital games than female children do, that the children in the 12-15 age group spend more time playing digital games than those in the other groups, and that the children of the parents with a lower education level spend more time playing digital games than those of the other parents.

This study is intended to determine the information, attitudes and behaviours of the children of parents employed in health sector with a high education level towards digital games and internet security. It also aims to enhance the health-staff parents’ awareness of the positive and negative effects of digital games.

Materials and Methods:

This study was conducted with the participation of 299 health-staff parents (doctor, nurse and other health staff) employed at Dr. Abdurrahman Yurtaslan Ankara Oncology Training and Research Hospital and Gülhane Training and Research Hospital affiliated to University of Health Sciences in March 2018.

The participants were informed that they should answer the questions if they have children between the ages of 5 and 18. Once the participants had been given necessary information about the study, their written permissions were taken; then a survey was applied to them concerning their socio-demographic qualities and questioning their children’s information, attitudes and behaviours towards digital security. It was conducted on a voluntary basis. The ethics committee approval was taken from the Health Sciences University’s Non-Invasive Clinical Research Ethics Committee. The data about the study were transferred to the SPSS programme and analysed statistically.

Results

299 parents who were also health staff were included in the study. 210 (70%) of the participants were female and 89 (30%) were male. The average age of the participants was 41.3 ± 4.7 (min-max: 30-60). Women’s mean age was 40.8 ± 4.5 (min-max: 30-58), while men were 42.6 ± 5.1 (min-max: 30-60). On the basis of professional groups, 51 (17%) of the participants were doctors, 165 (55%) of them were nurses and 83 (28%) of them were other health-staff. The median of the participants’ number of children was 2 (min-max 1-4), and their average number of children was 1.76 ± 0.7 .

Children’s mean age was determined as 12.9 ± 0.7 for the first child and 5.04 ± 0.3 for the second child. Of the digital-security measures taken by the parents while using computer in daily life both for themselves and for their children, the highest rate was 75% on anti-virus software programmes; for their children, however, besides the



existing measures, 56% of them reported that they tried to ensure the digital security by personally following the internet pages and websites visited by their children. 20% (61) of the participants said that they themselves played digital games, while 70% (197) of reported that their children played them. The rate of parents who played or watched digital games with their children at varying frequencies was determined as 54% (151). On the other hand, the rate of parents who talked about digital games in daily talks with them was 55% (195) and that of those who did not do so was 45% (104). Most of those who reported that they did not talk with their children about digital games said that they did not want their children to play digital games and so they did not even want to talk with them about that issue. 78% (234) of the participants reported that they knew which games were in their children’s mobile phones or computers.

The rate of parents who intervened in their children choosing digital games was 72% (214). The parents employed in the health sector said that they mostly made their choices and decisions about the games on the basis of the content of the game (42%) and the age of the child (39%). Considering the views of the participants as regards digital games; their most striking answers over the negative aspects of the digital games were that the children playing digital games would be less socialized by 17% (165) and that playing digital games would affect children’s health negatively by 14% (142). While there appeared no striking difference between the answers given to the negative aspects of digital games, the parents born in and after 1980, also called digital native, agreed on the positive aspects of digital games at a higher rate. However, no statistically significant difference was found. 62% (183) of the participants reported that they children did not spend more time than acceptable for digital games, and 88% (262) of them said that their children did not spend money over digital games.

Conclusions

This study reveals that health professionals, though mindful of health and cognizant of the health risks, do not have much information and awareness of digital games though they think and feel that digital games can be harmful. For the required measures to be taken against digital games and internet security, having come to be a public health problem these days, the studies on this issue should be conducted with the collaboration of different professional groups; and this is largely expected to form a basis for these measures.

Key Words: Health staff, parent, child, digital game.

References

- Bekmezci, H., Atatürk, H. Ö., Sağlık, Ü., & Fakültesi, B. (n.d.). Oyun ve oyuncağın çocuk sağlığına etkisi The effect of games and toys on child health. <https://doi.org/10.5222/buchd.2015.081>
- Günlü, A., & Ceyhan, A. A. (2017). Investigating Adolescents’ Behaviors on the Internet and Problematic Internet Usage. *Addicta: The Turkish Journal on Addictions*, 4(1).



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<https://doi.org/10.15805/addicta.2017.4.1.0016>

MD, G. (2002). Mark Griffiths The educational benefits of videogames Videogames have great positive potential in. *Education and Health*, 20(3), 47–51. <https://doi.org/10.1145/950566.950583>

Pe N. (n.d.). Ouderlijke zorgen over het “gamen” van hun kinderen. Retrieved from http://en.aup.nl/wosmedia/3559/vol_23_nr_4_-_ouderlijke_zorgen_over_het_%5Cgamen%5C_van_hun_kinderen.pdf

TÜİK. (2014). İstatistiklerle Çocuk 2014, 149.

TÜİK. (2017). Türkiye İstatistik Kurumu, Hanehalkı Bilişim Teknolojileri Kullanım Araştırması, 2017. *Türkiye İstatistik Kurumu*. Retrieved from <http://www.tuik.gov.tr/PreHaberBultenleri.do?id=24862>

Yılmaz, E., Griffiths, M. D., & Kan, A. (n.d.). Development and Validation of Videogame Addiction Scale for Children (VASC). <https://doi.org/10.1007/s11469-017-9766-7>



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POSTER PRESENTATIONS



Gençlerin Görsel Etkileniminin Pupil Yanıtı İle Değerlendirilmesi

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Giriş

Pupil (göz bebeđi) irisin orta kısmında, ışığın gözün içine girdiđi yuvarlak bir açıklıktır. Pupil açıklığı göze yansıyan ışığın şiddetine bađlı olarak deđişir. Aynı zamanda psikolojik stimülasyonun sonucu olarak otonom sinir sisteminin etkisiyle sürekli osilasyonlar da gösterir.

Pupil çapını etkileyen ilk ve öncelikli mekanizma parlaklığın etkisidir. Parasempatik sinir lifleri parlaklığın fazla olduđu durumlarda retina üzerine ışık akışını azaltmak için pupili daraltırken parlaklığın yüksek olduđu ortamlarda pupil çapını genişletir.

Pupil çapını artıran ikinci durum, yoğun duygusal uyarılardır. Görsel ya da işitsel yoğun duygusal uyarılar kişinin içsel uyarımı ile pupil çapını artırır. Pupil çapını artıran bir diđer durum kişinin zihinsel eforunun arttıđı durumlardır. Ayrıca sürpriz gibi beklenmedik bir durumla karşılaşmak ve yukardan aşıđı işleme (algılarımızın ve davranışlarımızın beklentilerimiz tarafından etkilenmesi) durumunda da pupil çapında artma görülür.

Pupil çapının duygusal uyarılar sonucunda deđişiyor olması özellikle görsel ve işitsel şiddetle karşılaşan bireylerde pupil çapını etkileyebilir. Bu çalışmanın amacı gençlerin karşılaştıkları şiddet görüntülerinden etkilenme durumlarının pupil çaplarının ölçümü ile değerlendirilmesidir.

Materyal ve Metod

Çalışmaya 15 üniversite öğrencisi alınmıştır. Öğrencilere 20’si nötral özellikte (günlük hayatta rutin olarak karşılaştıkları) 20’si olumsuz duygular oluşturabilecek, içinde şiddet içeren ya da şiddetin sonucu olabilecek görüntüler de bulunan fotoğraf setleri Şekil 1’de görülen bir deney süreci içinde gösterilmiştir. Deneyde kullanılan tüm fotoğraflar International Affective Picture System’de (IAPS) kayıtlı fotoğraflar arasından seçilmiştir. Fotoğraf seçiminde fotoğrafların IAPS de kayıtlı olan duyuşsal deđer, uyarılmışlık ve baskınlık deđerleri dikkate alınmıştır.



Nötral

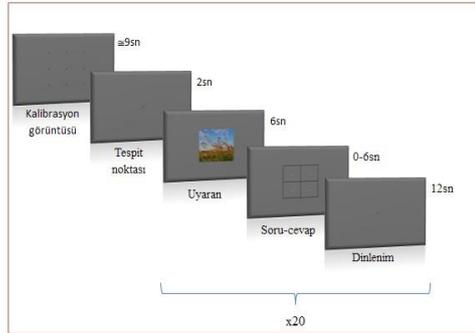


Olumsuz

Fotoğraflar bilgisayar ekranından gösterilmiştir. Fotoğraflar arasındaki parlaklık farkının pupil çapına etkisini nötralize etmek için tüm fotoğrafların parlaklık derecesi birbirine yakın değerlerde olacak şekilde filtre uygulanmıştır.

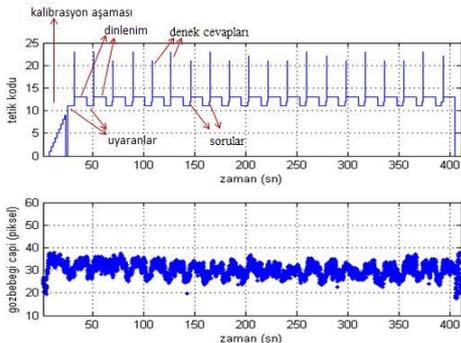
Öğrencilere ilk önce nötral fotoğraflardan oluşan 1. Set gösterilmiş daha sonra 120 saniyelik bir sürede öğrencilerin anksiyete düzeylerini değerlendirmek için PANAS test uygulanmıştır. Ardından olumsuz fotoğrafları içeren 2. Set fotoğraflar gösterilmiştir.

Deney paradigması

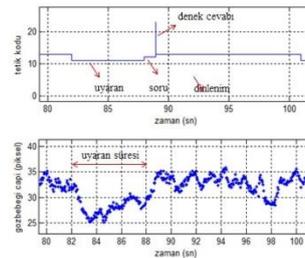


Deneyin gerçekleşme sürecinde pupil çaplarındaki değişim, araştırmacılardan biri tarafından geliştirilen bir kamera tarafından kaydedilmiş ve bu kayıtların analizleri sonucu belirlenmiştir.

DeneySEL ölçüm verisi



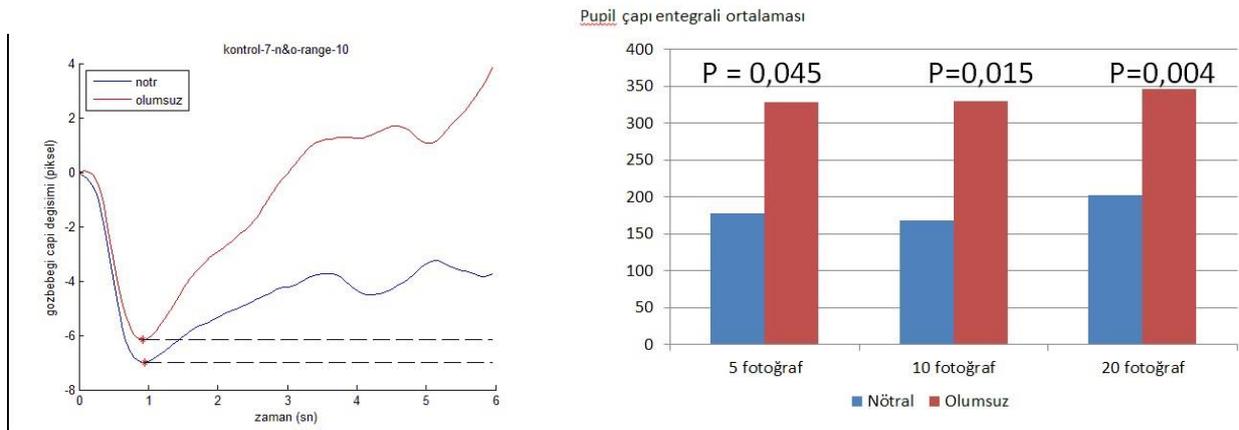
DeneySEL ölçüm verisi (detay)



Elde edilen verilerin analizinde; pupil çapının büyüklüğünü değerlendirmek için deney sürecinde pupil çapındaki değişimi gösteren eğrinin altında kalan alan hesaplanmıştır. Öğrencilerin farklı özelliklerdeki (1. Set nötral fotoğraflar, 2. Set olumsuz fotoğraflar) fotoğraflara verdikleri yanıtı karşılaştırmak için bu veri kullanılmıştır.

Sonuç

Bir öğrencinin nötral ve olumsuz fotoğrafa pupil yanıtı resim 2’de görülmektedir. Grafikte ilk düşüş değeri ışıkla karşılaşma sonu oluşan pupil çapındaki küçülmeyi göstermektedir. Daha sonraki artış pupil çapındaki ondulan artışın göstergesidir.



Tüm öğrencilerin 1. ve 2. Set fotoğraflardan ilk 5, ilk 10 ve 20 fotoğrafı izledikten sonraki pupil çapı integral değerlerinin ortalamaları grafikte görülmektedir.

Tartışma

Şiddet günümüzde yaygın ve kanıksanan bir form kazanmıştır, Üstelik keyif ve eğlenme amaçlı etkinliklerin de içine kadar işlemiştir, Bu bağlamda dijital oyunlardaki şiddet görüntülerinin otonom sinir sistemini etkileme ve buna bağlı nöronal değişiklikler oluşturma riski vardı,

Halen bir çok dijital oyunun augmented reality teknikleri ile görüntüleniyor olması , animasyonun yerini gerçeğe çok yakın görüntülerin alması şiddeti gerçek hayatta olduğundan daha yoğun ve ağır şekilde algılamaya neden olabilir, Kişi oyun oynarken bir kurmacanın içinde olduğunu düşünse de gerçeğe çok yakın görüntüler otonom sistemin kişinin denetiminden bağımsız olarak etkilenmesine neden olabilir, Bu da oyunlardaki şiddet görüntülerinin özellikle çocuklarda ve gençlerde santral sinir sisteminin etkilenmesine ve henüz yapılanmasını tamamlamamış genç beyinlerin karşılaştığı stresten olumsuz şekilde etkilenmesine neden olur.



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Kaynaklar:

1. Feinberg, M. E., Jones, D. E., Hostetler, M. L., Roettger, M. E., Paul, I. M., & Ehrenthal, D. B. (2016). Couple-focused prevention at the transition to parenthood, a randomized trial: Effects on coparenting, parenting, family violence, and parent and child adjustment. *Prevention science*, 17(6), 751-764.
2. Ulukol B, Kahilogulları A, Sethi D. Adverse childhood experiences survey among university students in Turkey. 2014, WHO Publication
3. Shonkoff, J. P., Garner, A. S., Siegel, B. S., Dobbins, M. I., Earls, M. F., McGuinn, L., ... & Committee on Early Childhood, Adoption, and Dependent Care. (2012). The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*, 129(1), e232-e246.
4. Bucci, M., Marques, S. S., Oh, D., & Harris, N. B. (2016). Toxic stress in children and adolescents. *Advances in pediatrics*, 63(1), 403-428.
5. Bradley, M. M., Miccoli, L., Escrig, M. A., & Lang, P. J. (2008). The pupil as a measure of emotional arousal and autonomic activation. *Psychophysiology*, 45(4), 602-607.
6. Geangu, E., Hauf, P., Bhardwaj, R., & Bentz, W. (2011). Infant pupil diameter changes in response to others' positive and negative emotions. *PloS one*, 6(11), e27132.
7. Hanson, J. L., Chung M. K., Avants B. B., Rudolph K. D., Shirtcliff, E. A., Gee J. C., Davidson R. J., Pollak, S. D. (2012) Structural Variations in Prefrontal Cortex Mediate the Relationship between Early Childhood Stress and Spatial Working Memory. *Journal of Neuroscience*,; 32(23): 7917 DOI: 10.1523/JNEUROSCI.0307-12.2012.
8. Toxic Stress: The Facts. (2012). Center on the Developing Child at Harvard University. Retrieved February 2013, from http://developingchild.harvard.edu/topics/science_of_early_childhood/toxic_stress_response/



A Software Application For Parents to Identify the Internet and Computer Use Characteristics of Their Children and Perform Parental Mediation Based on It

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Abstract

The use of computers and Internet has grown exponentially and has become an almost indispensable part of daily life. The use of the pair; many advantages, conveniences and positive implications and effects aside, has been associated with many negative and unwanted outcomes and consequences relating to psychosocial and physiological health, such as Internet Addiction and obesity. There are many other negative outcomes especially for children, which include privacy and security violations, exposure to sexual material and social interaction. Parents, therefore, find themselves in a challenge during which they act as a mediator between their children and their children’s computers and Internet use. They try to maximize the advantages of their children’s experience while seeking ways to eliminate negative effects that some content or contact might have on their children’s safety or behavior. Such efforts has been coined as parental mediation and there are different parental mediation strategies and approaches including rule-making and restrictions, social or active co-viewing and parental monitoring. Rule-making and restrictions allow parents to regulate, direct and keep children’s computer and Internet use under control. A significant restriction is called screen time. Organizations such as American Academy of Pediatrics (AAP) establish guidelines on parental mediation strategies that help parents. In their parental mediation on children’s media use guideline’s latest version, AAP proposed, based on scientific evidence, a classification of screen time for children. This classification brings a new approach for parents; to identify their children’s media use and establish a mediation based on it. Considering all the evidence, facts and new policy approaches, there is a growing need for an application software to help parents implementing an all-in-one parental mediation strategy. In this study, we aim to develop an application software that will help parents performing and organizing parental mediation activities as a whole. The application will help parents (i) increase their awareness of the risks their children may face while accessing the Internet, (ii) monitor and regulate children’s, both online and offline moves, (iii) learn about and recognize their children’s media use characteristics for parental bonding purposes and (iv) establish, apply and change, where and when necessary, their parental mediation strategy based on children’s short and long term Internet use characteristics. The implementation of the application adopts AAP’s classification of screen time approach and is equipped with modules with both operating system specific and parental mediation specific functionalities that makes it possible for parents to apply their policy as a whole. This paper presents application’s modules, functions and abilities.



Keywords: parental mediation, screen time, Internet use, Internet addiction, software application.

Introduction

The use of computers and Internet has grown exponentially and has become an almost indispensable part of daily life. The rapid spread of Internet use with respect to years shows, in Figure 1, that as of 2016 an estimated 45.96% of total world population had had access to Internet according to International Telecommunication Union [1]. This can be perceived as a simple indicator for the computers and Internet pair, becoming the major medium of many daily activities (e.g. communication) and how the pair has interpenetrated our lives.

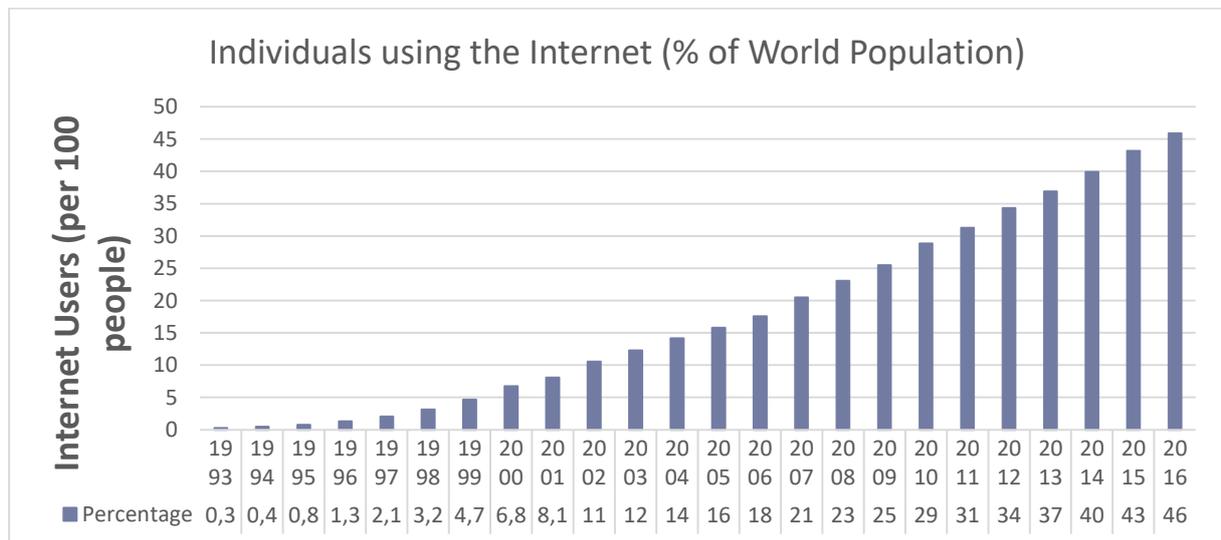


Figure 1. Global spread of Internet use.

Excessive Internet Use and Its Major Consequences

The use of the pair; many advantages, conveniences and positive implications and effects aside, has been associated with many negative and unwanted outcomes and consequences. Some studies have noted a relationship between people’s Internet use and psychosocial health [2-9]. There were efforts that focused on out-of-purpose, uncontrolled and excessive use of computers and Internet. Scholars coined different terms to describe the condition of people who engage in such use of computers and the Internet that results in negative outcomes. These terms include but are not limited to Internet Addiction [3], Problematic Internet Use [4] and Pathological Internet Use [5,6]. Young coined the term Internet Addiction and defined it as “an impulse-control disorder which does not involve an intoxicant” [2]. A number of scholars have raised concerns



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and criticized Young’s addiction framework. As one of them, Caplan has labelled the condition as Problematic Internet Use and defined it as “behaviours and cognitions associated with Internet use that result in negative personal and professional consequences for the user” [4].

Some studies aimed to manifest the factors correlating to negative effects and outcomes of excessive and uncontrolled use of computers and Internet on children [10-13]. In their study with a large Taiwanese adolescent student sample, Yen et.al. stated that lower family function and higher parental-adolescent conflict were contributing factors of a predictive model for Internet Addiction [10]. Young has noted that the absence of an Internet access control or restriction method to be operated by parents is among the factors which causes misuse of Internet by children [11]. Similarly, Yen and colleagues identified low family monitoring as a discriminative factor for Internet addiction [12]. However, in a relatively recent study, Siomos and colleagues has classified parental bonding variables, but not parental security practices, as the best predictor variables for Internet and computer addiction [13].

Other Risks Children May Face

Excessive and uncontrolled or not, access to and use of Internet per se has significant potential to expose children to various risks, which include privacy and security violations, exposure to sexual material and social interaction.

In their follow-up study, Siomos et.al. examined if parents were aware of the risks their children face for Internet or computer addiction by applying Adolescent Computer Addiction Test (ACAT) to adolescents and ACAT’s parent version to each adolescent’s parents (both mother and father). Surprisingly, the children consistently reported higher values for themselves than their respective parents did, which implies parents may be underestimating the problem [13].

Parental Mediation

Parents, at times, find themselves in a challenge during which they act as a mediator between their children and their children’s computers and Internet use. They try to maximize the advantages of their children’s experience while seeking ways to eliminate aforementioned negative effects that some content or contact might have on their children’s safety or behavior. Such efforts has been coined as parental mediation in studies. Livingstone and Helsper define parental mediation as “the parental management of the relation between children and media” [15]. Studies reported different parental mediation strategies and approaches including rule-making, restrictions, social or active co-viewing and parental monitoring [15]. For instance, a study conducted by European Opinion Research Group revealed seven rules set by the parents most for their children’s computers and Internet use [16]. Figure 2 depicts these seven rules with their percentages. The study revealed that “blocking access to specified sites” as the most common rule referred by the parents.

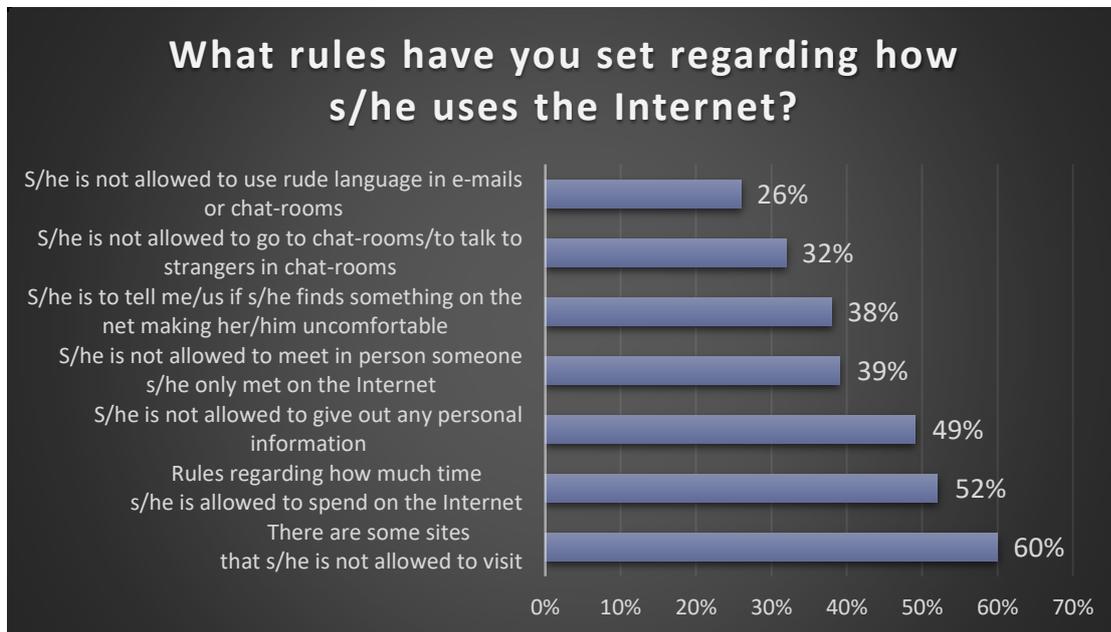


Figure 2. Rules regarding the use of Internet

In their study dated 2015, Livingstone and Duerager found that rule making and restrictions approach reduces the risks to encounter cyberbullying, pornography and meeting strangers on the Internet. However, in the same study, they also noted that rule making and restrictions approach might cause children to have less opportunities for improving communication and socializing skills [17].

Parental Monitoring

Parental monitoring involves the acts of tracking and checking children’s online activities (e.g. checking bookmarks and browser history for visited Web sites periodically) through the traces they would leave behind.

There are several software tools that help parents apply rules and restrictions on children’s computers and Internet use. Some of these tools focus on single functionality such as “Time-limiting, “Monitoring” and “Filtering and Blocking”, whereas there are some applications that pair up these functionalities. Using time-limiting application softwares, parents can set limits on how much time they allow their children to use computers. Monitoring softwares may be called informants about children’s online activity. They mainly record information on children’s moves (e.g. visited Web sites) and display warning messages in case the content children would attempt to access is inappropriate. Filtering and blocking tools enables parents to limit children’s access to some content (e.g. Web sites or pages).

Guidelines on Media Use



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There are some other efforts, by organizations such as American Academy of Pediatrics (AAP) [18], in the form of a guideline that present policies with recommendations on implementing parental mediation based on evidence acquired within a set of conducted studies. In these guidelines, one of the most important recommendations is regarding how long a child could use a device with a screen. In their guideline dated 2013, AAP defined and used the term “screen time for children” [19]. It refers to a recommended total duration based on age that children could use media per day (e.g. television, computers, and cellphones). Screen Time recommendations are made based on the sum of all screen-related activities. However, there is emerging evidence that suggests that computer use and video game play should not be classed as the same type of activity as TV viewing [20]. Consequently, there has been a significant change in parental mediation policy guidelines. In their guideline’s latest version, AAP proposed a classification of screen time for children [21]. The Australian Government proposed another classification approach, which shows similarities with AAP’s []. These classifications bring a new approach for parents; to identify their children’s media use and establish a mediation based on it.

Aim of the Study

A study by Siomos et.al. [13] has concluded that parental safety measures on Internet browsing have only a small preventive role and cannot protect adolescents from Internet addiction . They also add that the best predictor variables for Internet and computer addiction were parental bonding variables and not parental security practices. Considering all the evidence, facts and new policy approaches, there is a growing need for an application software to help parents implementing an all-in-one parental mediation strategy.

In this study, we aim to develop an application software that would help parents performing and organizing parental mediation activities as a whole. The application will help parents

- Increase their awareness of the risks their children may face while accessing the Internet,
- Monitor and regulate children’s, both online and offline moves,
- Learn about and recognize their children’s media use characteristics for parental bonding purposes
- Establish, apply and change, where and when necessary, their parental mediation strategy based on children’s short and long term Internet use characteristics.

The implementation of the application adopts AAP’s classification of screen time approach and is equipped with modules with both operating system and parental mediation specific functionalities that makes it possible for parents to apply their policy as a whole. This paper presents system architecture and desktop application’s modules, functions and abilities. The rest of this paper is structured as follows; the functionalities, system architecture and methods which were adopted and applied for the development



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of the application, with necessary materials are explained in the next section. The last section summarizes the limitations, features planned to be added to the desktop application and effectivity and usability investigations.

Materials and Methods

System Architecture

The system has been designed and implemented to operate on two modes; offline and online. In the offline operation architecture, the major component is a target computer that parents allow their child to use and access the Internet. Along with the target computer, the offline architecture incorporates an application software that will be configured to run on that computer and a local database to enable that application software perform its several functions embedded in its modules. Parents can perform all types of mediation activities (i.e. restrictive, monitoring and co-use) through the use of the application for and on the computer that system components are installed.

The online operation architecture, however, involves several elements enabling parents to monitor their children’s computer use and Internet access status and make changes in their strategy if necessary, remotely at any instant. The online operation mode involves a server-side application running on a server, a Web server and a database, along with any number of target (client) computers that are registered to online database as those computers children are allowed to use and access the Internet. The software application, which is also a component of offline operation mode, has to be installed and configured to run on each target computer with a local database in order for the online operation architecture to function.

This two-mode operation architecture also makes the system to continue to run offline, whenever the online operation mode fails to operate. As soon as our system’s application software is started on a computer, it defines its operation mode depending on the availability of network connection and executes in the background, as a background process.

Tools

Throughout the design and implementation of application software, Object-Oriented Methodology was adopted. The application was implemented on Visual Studio 15.3.0 with .NET Framework 4.7.02556 using C# programming language. The server-side components were developed on the same platform, using the same programming language. The data models of online and offline databases were designed based on the Entity-Relationship Model. For the implementation of these data models, different database management system softwares are adopted. The relational schema of online database was obtained on MySQL, whereas for the implementation of offline (local) database, SQLite was preferred due to optimized performance (i.e. SQLite provides better throughput than MySQL for running SQL statements).

Application Modules and Their Functions

Application software has been designed to have several modules, each of which is assigned a set of functions. For each function assigned to a module, a submodule is designated. Each submodule has been implemented to run as a separate thread.

Screen Time Management Module (STMM)

This module is designed and implemented for parents to apply screen time rules declared in guidelines of organizations such as American Academy of Pediatrics (AAP). The module consists of three submodules.

The first submodule, Screen Time Control Submodule (STCS) enables parents to set total screen time per day. The screen time unit is minutes per day. In STCM, parents are asked to determine and input a value for screen time based on child’s age. However, STCM also helps parents determine the appropriate screen time for their child. For this purpose, STCM asks parents to input their child’s date of birth, the submodule calculates child’s age and informs parents about the recommended screen time (in minutes per day) depending on child’s age as recommended by AAP. Parents can change the screen time through this submodule whenever they want to. The graphical user interface (GUI) of STCS is shown in Figure 3.

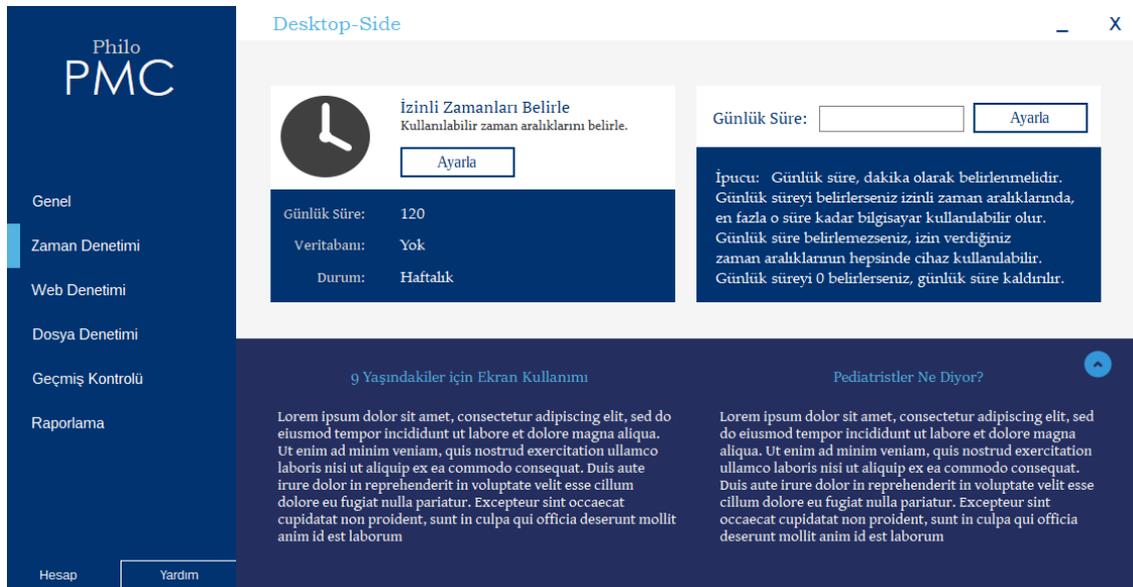


Figure 3. GUI for STCS.

STCS is also responsible for checking periodically, in real-time, to make sure the total time child spends using registered computers that day does not exceed screen time. For this purpose, every time child logs in on a registered computer on the same day, STCS saves the time of login operation in the local database, reads the total number of minutes (from the local database) that child has spent for using any registered computer



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on that day and starts a timer. Using that timer, STCS starts to perform the following algorithm periodically;

- Calculate the current length of the session (i.e. current session duration, total time child has made use of the registered computer since child has logged in on that computer),
- Add the total number of minutes that child has spent for using any registered computer on that day (read from the database) and current session duration (i.e. to calculate the total number of minutes child has spent at that instant on that day)
- Finally, it compares whether the total number of minutes child has spent until that instant on that day is less than the total screen time set by parents.

Thus, using the above algorithm, STCS checks whether child has reached designated screen time limit. Whenever it detects that the total screen time is reached, it stops child by logging out implicitly. STCS also incorporates a mechanism to allow instant computer use at a forbidden hour. This mechanism, simply, asks user to input a password, which is predefined by parents.

Using the second submodule, Computer Use Management Submodule (CUMS), parents prepare a timetable to specify when their child may and may not use registered devices. Basically, through this submodule’s interface, parents can mark those time periods that they allow and they disallow their child to use registered computers. Parents can configure this timetable through this submodule’s user interface for each day in a week on an hourly basis and make necessary changes on timetable whenever they want to. In addition, whenever child tries to login on one of the predefined computers, CUMS checks whether the time at that instant is within a preset hour that parents has marked as “allowed”. If not, the login operation fails and CUMS warns child via a message box with the text “Not an allowed hour to use computer”. Figure 4 presents an instance of GUI for CUMS.



Figure 4. GUI for CUMS.

The third submodule, Internet Access Management Submodule (IntAMS), makes it possible for parents to setup the Internet access timetable. Simply, parents mark the time periods, during which they allow and disallow their child to access the Internet. Using the IntAMS's interface, parents prepare a Daily Internet Access Plan (DIAP) for each day in a week. DIAP defines Internet Access on a 24-hour basis. For each hour on a day, parents decide whether to allow or disallow to access the Internet by clicking a two-mode button. At the hours of each day that parents allowed Internet access, child can run any application requiring any type of network operation. Within the rest of the hours, the third module blocks all types of network operations (e.g. view or download Web content). The third submodule achieves blocking by creating a rule on Windows Firewall. It runs and terminates the execution of this rule by following a simple two-step looped algorithm; (i) read the local host time and (ii) check if the current time is within the allowed hours in the Internet access timetable. Fundamentally, the rule shuts down both incoming and outgoing data traffic at the transport layer through TCP and UDP protocols if the current time is not within the allowed hours in the timetable. Therefore, even if there is active physical network connection, no data traffic will be technically possible.

The submodules CUMS and IntAMS work in cooperation. The cooperation is based on the input. In case parents do not set a timetable in one of these submodules, they have to set using the other submodule, so that both submodules use the same input. “Using the same input” means allowing child to both use registered computers and access the

Internet at the same hours of days of a week. Besides, in case parents’ input for hours to use computers and hours to access the Internet have non-overlapping points (e.g. on Mondays between 08:00 and 08:59, parents have allowed their child to access the Internet, but not allowed to use the computer), IntAMS warns about such errors and asks parents to correct their input.

Web Content Restriction Module (WCRM)

WCRM is the rule-making module for parents to manage children’s access to Web content. Figure 5 depicts an instance of GUI for WCRM with its two submodules.

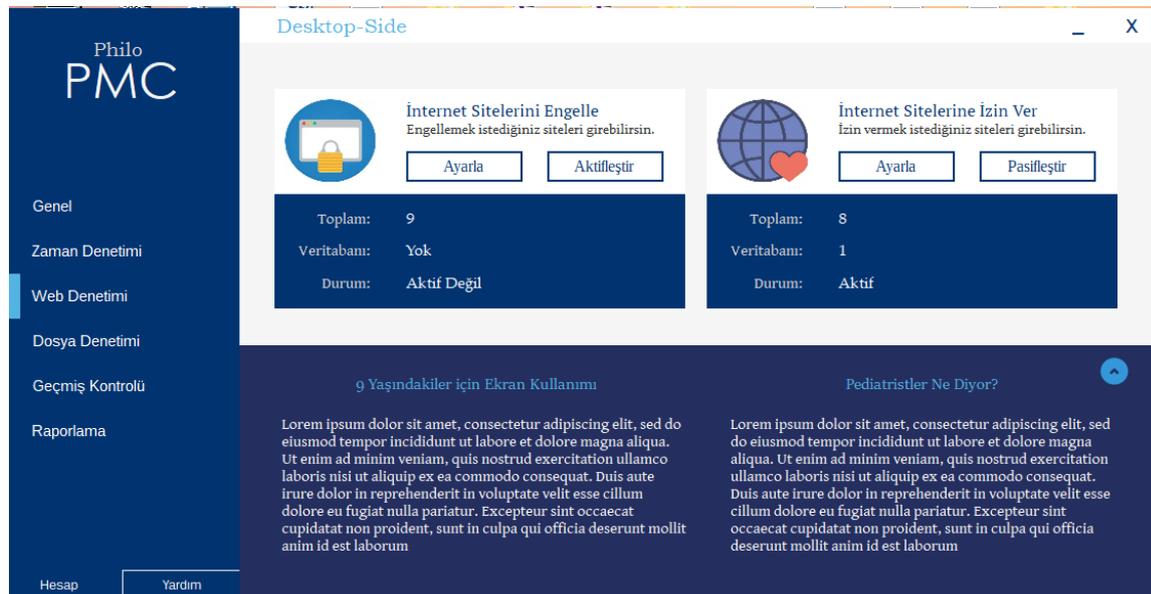


Figure 6. GUI for WCRM.

The first submodule enables parents to block access to the Web content that they find harmful or inconvenient. The parents can block access to any content by inputting its Uniform Resource Identifier (URI). In case parents would like to block the whole content on a Web site, they just need to input the Uniform Resource Locator (URL). The first submodule achieves blocking by making use of the Domain Name System (DNS). Simply, it writes URL to be blocked and a dummy Internet Protocol (IP) address pair in the “hosts” file. The “hosts” file is a Windows operating system file that contains (URL, IP address) pairs. Whenever a network operation request with a URL is generated by a software application (e.g. Web Browser), Windows operating system first checks whether the URL is available with its IP address in the hosts file. If it finds a match with the URL, then it reads the IP address next to it and tries to initiate the communication using that IP address for that application. Subsequently, due to the use of dummy IP address, any software application attempting to connect to a server for a forbidden content would fail to communicate. Using this submodule, parents can also view the current list of restricted URLs and cancel the restriction anytime whenever they want to.

The second submodule, called Only-Allowed-Content (OACS), operates on a more restrictive approach. This submodule enables parents to allow their child to view only those URLs (Web sites) which they think is harmless or inoffensive. Permitted URLs of Web content should be input one by one by parents. Each permitted URL input by parents is stored in the system databases. In order to ensure that child does not view or access any unpermitted Web content, the submodule, primarily, reads the permitted URLs from system databases and then starts to periodically run a three-step algorithm. In the first step, the submodule checks whether one or more Web Browser windows are open. If so, in the next step, the submodule acquires access to Web Browser’s database where it stores necessary information about each open tab, including URL, for which the tab displays the content. In the final step, it reads all URLs of open tabs and compares each one with the permitted URLs it has read from system database to check whether URL of that open tab is one of the permitted URLs. In case the URL of an open tab is not one of the permitted URLs, the third submodule immediately terminates the related tab displaying the forbidden Web content. By running this algorithm repeatedly every 2 seconds, the submodule assures that child cannot view any unpermitted Web content. A snapshot of GUI for the OAC can be seen In Figure 7.

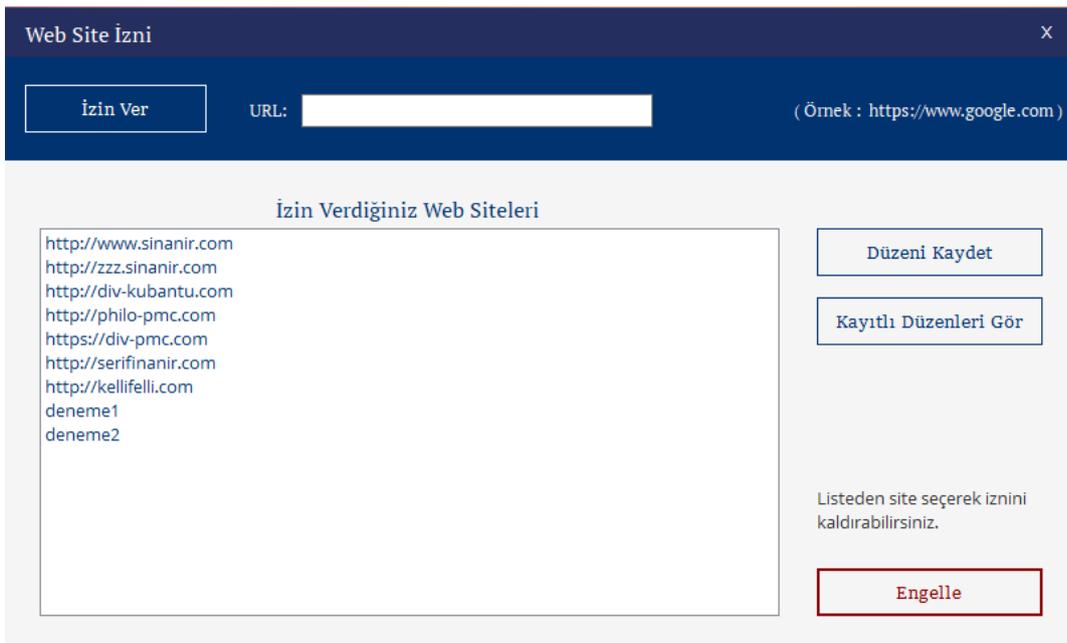


Figure 7. A GUI snapshot of OACS.

It should be noted that the two submodules of WCRM cannot be run concurrently. In other words, parents should choose only one of these submodules, which fits their strategy, and run appropriately.

Local Host Resource Access Control Module (RAMCM)

The computers, which parents allow their children to use, might have many resources (e.g. files, application softwares) stored or installed that parents would not like their

children to access. RAMCM is the system module that makes it possible for parents to manage children’s access to such resources. The resource types that RAMCM deals with include files, directories, application softwares and system programs (e.g. task manager). RAMCM is composed of four submodules, each of which enables parents operate on these different types of resources. Figure 8 shows module’s graphical user interface with its submodules.

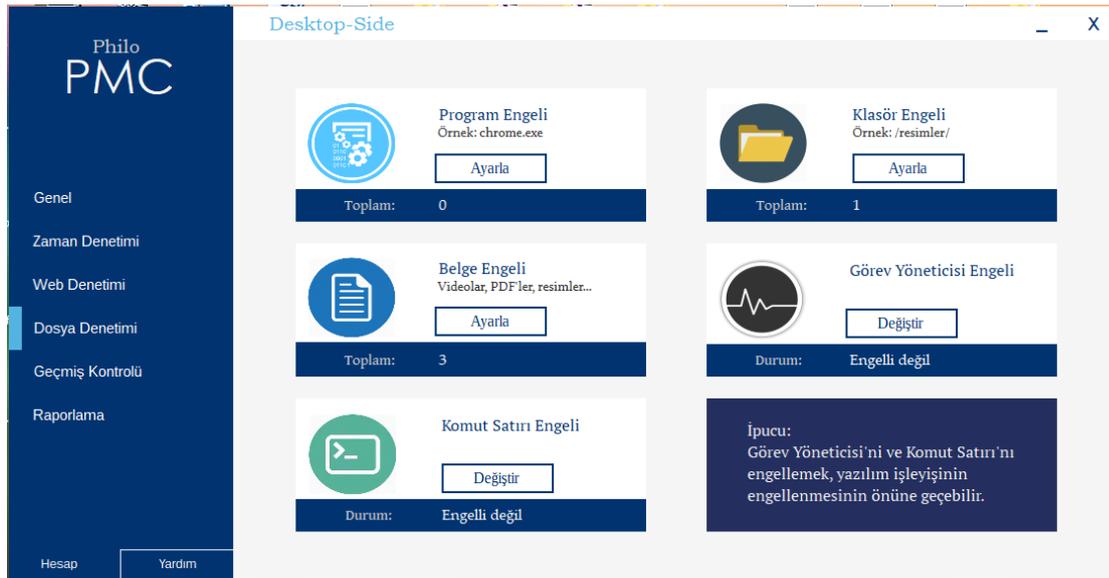


Figure 8. RAMCM with its submodules.

The Application Execution Control Submodule (AECS) aims to restrict access to and execution of any installed application that parents find offensive or harmful for their child. For instance, some computer games might be harmful to psychological or psychosocial development of children at certain ages and must be restricted. The submodule, simply, asks parents to locate .exe files or shortcuts to applications that they don’t want their child to execute. In order to restrict the execution of an application, AECS traverses and finds its entry in the operating system’s registry database. AECS simply edits the execution permission of application for child’s user account so that child cannot execute it. Parents can later cancel or inactivate any execution restriction by choosing the related .exe file or shortcut of an application and clicking the cancel button.

Another submodule, File Access Restriction Submodule (FARS), makes it possible for parents, in a two-step operation, to block child’s access to files and directories, which parents may think is dangerous. In the first step, parents select a file or a directory. In the next step, FARS edits the selected file’s permissions to read and write for child’s user account so that child cannot open, view, move, delete or change the contents of a file or a directory. FARS makes use of system calls to access and edit registry database of Windows operating system for its operations. Figure 9 depicts the GUI for FARS.

The third and fourth submodules are critical to the operation of the system and might become necessary to use when children’s ability to use computers improve. Through the

use of the submodule called Task Manager Access Control Submodule (TMACS), parents can block execution of task manager by their child. Blocking the task manager might become necessary in case children discover that they can terminate any running application using it. Blocking the task manager will prevent children terminate our system’s application software while running on the background. Similarly, the Command Line Access Control Submodule (CLACS) helps parents block their child’s access to command line. Both submodules use system calls targeting the registry database to block the execution of related system program.

Activity History Monitoring Module (AHMM)

In order to identify children’s characteristics to use computers and access Internet, their history of use and Internet access might be a helpful tool for parents. Activity History Monitoring Module is designed and implemented to provide significant information regarding children’s past activity both on computer and the Internet. For this purpose, AHMM is formed of three submodules, each of which, as soon as child performs an activity, saves relevant information into the local database about it, such as type of activity and time of activity.

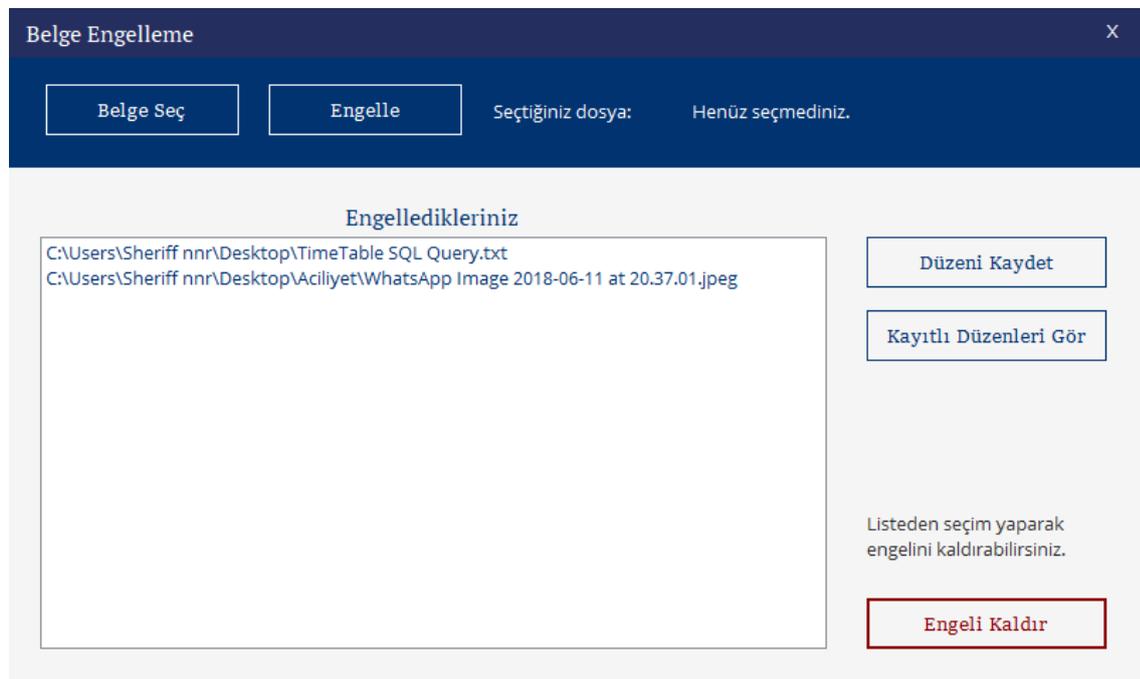


Figure 9. GUI instance for FARS.

As a submodule, Web Content History Monitoring Module (WCHMM) provides a list of visited URIs and URLs for the last 30 days. WCHMM, by making calls to relevant system calls, gains access to Web browsers’ database (if child is running browsers) and (I



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checks and reads new entries to Web browser’s history database, (ii) reads relevant information, such as local time of visit, about each new entry and (iii) calculates visit frequencies for visited URLs.

The Download History Module (DHM) shows parents the files that children would download from the Internet using installed browsers. To do so, DHM periodically acquires access to browsers’ database, where browsers save information about each file download operation, such as download success and download finish time. DHM periodically checks whether new download entries to browsers’ database exist and if so, it saves related information into local database. Through DHM, parents can list and instantly block their children’s access to any of these files or simply delete them. To block access to a file, DHM gets the path of the file and perform a system call to change the permissions of child’s account for that file.

The Executed Application History Submodule (EAPS) keeps track of applications that child executes. For this purpose, EAPS reads Process Control Block (PCB) of each user process currently registered by operating system periodically (every two seconds) and saves execution related information such as application name, execution start time and total time of execution, whenever it detects a new application is run by children.

Future Work

The system architecture and application software presents an “all-in-one” solution for both monitoring problematic behaviors that children could face and exhibit and building a strategy in relation with their use of computers and Internet. However, the system both poses some serious limitations and lacks some serious features and functionalities. For instance, concurrent use of more than one registered computer is a problem. Single sign-on should be added. Additionally, the system should incorporate a module that is able to manage children’s access to devices, such as disk drives and flash memory sticks, since there might be cases in which children should be blocked to use such devices. Furthermore, keeping track of files that children had accessed on applications they run might help parents to build a robust strategy and broaden it. Therefore, the functionality to monitor the history of executed applications with accessed files should be added to AHMM. Finally, a module to help parents categorize their children’s screen time is designed and will be added. This module, for instance, will help parents to predict how many minutes of total screen time is spent (I) actively (i.e. child in motion while using the computer) and passively, and (ii) for recreational and essential purposes (i.e. educational).

The authors plan to design and conduct a series of studies that will investigate the effectiveness and usability of the application software. The studies will focus on answering the following questions;



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- How effective is the application software in terms of monitoring and enabling parents to establish a media use policy and change it whenever necessary for their children?
- How does children’s media use characteristics change after the use of application?
- How satisfied are parents while using the application software?

References

1. International Telecommunications Union, ICT Facts and Figures 2016, accessed 10.02.2018, <https://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2016.pdf>
2. Young, K. S. (1996). Internet Addiction : The Emergence of a New Clinical Disorder. Published in *CyberPsychology and Behavior*, 1(3), 237–244. <https://doi.org/doi:10.1089/cpb.1998.1.237>.
3. Young, K. S. (1996). Psychology of computer use XI: addictive use of the Internet: a case study that breaks the stereotype. *Psychological Reports*, 79, 899–902.
4. Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: Development of a theory- based cognitive–behavioral measurement instrument. *Computers in Human Behavior*, 18, 553-575.
5. Davis, R. A. (2001). A cognitive–behavioral model of pathological Internet use. *Computers in Human Behavior*, 17, 187–195.
6. Morahan-Martin, J., & Schumacher, P. (2000). Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior*, 16, 13-29
7. Beard, K. W., & Wolf, E. M. (2001). Modification in the proposed diagnostic criteria for Internet addiction. *Cyberpsychology and Behavior*, 4, 377–383.
8. Young, K. S., & Rogers, R. C. (1998). The relationship between depression and Internet addiction. *CyberPsychology and Behavior*, 1(1), 25–28.
9. Sanders, C. E., Field, T. M., Diego, M., & Kaplan, M. (2000). The relationship of Internet use to depression and social isolation among adolescents. *Adolescence*, 35, 237–242.
10. Yen JY, Yen CF, ChenCC, Chen SH, KoCH(2007) Family factors of internet addiction and substance use experience in Taiwanese adolescents. *CyberPsychology & Behavior* 10(3):323–329.



International Child and Information Safety Congress
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11. Young, K. S. (2004). Internet addiction: A new clinical phenomenon and its consequences. *American Behavioral Scientist*, 48(4), 402-415.
12. Yen CF, Ko CH, Yen JY, Chang YP, Cheng CP (2009) Multi dimensional discriminative factors for Internet addiction among adolescents regarding gender and age. *Psychiatry Clin Neurosci* 63(3):357–364.
13. Siomos, K., Floros, G., Fisoun, V., Evaggelia, D., Farkonas, N., Sergentani, E., ... Geroukalis, D. (2012). Evolution of Internet addiction in Greek adolescent students over a two-year period: The impact of parental bonding. *European Child and Adolescent Psychiatry*, 21(4), 211–219. <https://doi.org/10.1007/s00787-012-0254-0>.
14. Livingstone, Sonia and Haddon, Leslie (2009) Introduction. In: Livingstone, Sonia and Haddon, Leslie, (eds.) *Kids online: opportunities and risks for children*. The Policy Press, Bristol, UK, pp.1-6.
15. Livingstone, S., Helsper, E. J. (2008). Parental mediation of children’s internet use. *Journal of Broadcasting and Electronic Media*, 52(4), 581–599. <https://doi.org/10.1080/08838150802437396>.
16. European Opinion Research Group (2004). *Illegal and Harmful Content on The Internet*, URL http://ec.europa.eu/public_opinion/archives/ebs/ebs_203_en.pdf
17. Livingstone, S., Duerager, A. (2012). *How can parents support children’s internet safety?* London, UK: Eu Kids Online.
18. American Academy of Pediatrics (AAP), www.aap.org, 08.04.2018.
19. American Academy of Pediatrics (AAP) (2013). *Children, Adolescents and the Media*, Policy Statement.
20. Sweetser, P., Johnson, D., Ozdowska, A. (2012). Active versus passive screen time for young children. *Australasian Journal of Early Childhood*, Vol. 37, No. 4, Dec 2012: 94-98.



The Requirement for the Preparation of Digital Games in the Context of Teaching Principles

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Abstract

The target group of digital games is children and young people. In this study, digital games, which are determined as the target group of children between 04-06 and 06-12 years of age, provide educational support for permanent learning by providing learning, hand and eye coordination while having fun with interesting things. The conceptual framework of digital games and their use in classroom applications are included in the studies of digital games. In class applications, student and teacher opinions are frequently taken and topics such as viewpoints of the target group and those who play the digital game application, the expectations from the games and the play habits are analyzed. However, the teaching principles of games are ignored.

However, while digital games require visual, auditory stimulating elements and animations, there is a need for construction of basic teaching principles within a holistic approach. This requirement brings up the fact that the process of designing, planning, application, assessment and development of digital games should be prepared according to the basic teaching principles for educational function. For that reason, in this study, “The requirement for the preparation of digital games in the context of teaching principles” is handled as the problem case.

The main purpose of the study is to reveal the educational functions and principles of preparation of digital games. Since the study, which is carried out with the data based on descriptive literature, is dealt with within the existing conditions of its nature, the situation is described through an approach from general to particular and then the details are explained.

In the study, digital games are widely constructed away from the achievements, content and application elements that are suitable for children's levels. It is concluded that digital games are not able to reflect the teaching principles of step-by-step, and therefore, do not fully reflect the teaching principles from close to far, from concrete to abstract and from known to unknown. In the study, digital games should include visual, audio messages, animation, story, sound, examples, graphics, diagrams that will facilitate the perception of children and should be prepared in the design where children can use hand-eye coordination in harmony.

Keywords: Digital games, teaching principles



1. Introduction

In this study, **The Requirement for the Preparation of Digital Games in the Context of Teaching Principles** is discussed. Research is systematized as headings of (1) Introduction, (2) Problem situation, (3) Objectives, (4) Reason and Significance, (5) Limitations, (6) Method, (7) Findings and Comments, (8) Conclusions and Recommendations.

2. Problem situation: Digital games, whose target audience is children and young people, is effective learning while having fun and providing hand and eye coordination. In the studies related to digital games, the conceptual framework, types, use of applications, taking student and teacher opinions, determining the perspectives of the target audience and the applications of the digital game applications to the games, examining the expectations of the games and examining the play habits are analyzed however, it is observed that the size of the teaching principles of the games is ignored.

However, digital games require visual, auditory stimulating elements and animations, while basic teaching principles need to be constructed in an educational and holistic approach. This requirement raises the fact that design, planning, implementation, evaluation and development of digital games are prepared according to basic teaching principles for educational functionality. This is the reason why the subject “The requirement for the preparation of digital games in the context of teaching principles” is considered as a problem situation.

3. Objectives: The main purpose of the study is to reveal the educational functions and principles of preparation of digital games. In order to realize this basic objective, the following questions are being answered:

1-What are the educational functions of digital games?

2-What are the requirements for basic teaching principles in the preparation of digital games?

3- How should digital games be prepared in the context of basic teaching principles?

4. Reason and Significance: It is important that the study can contribute to the following aspects in the following directions:

- The educational functions of digital games can be demonstrated.
- In digital games, the need for teaching principles can be taken attention.
- The principles of teaching in the preparation of digital games will be able to explain.



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5. Limitations: The study is limited to; as a level with the first childhood and middle childhood level, as a subject with the basic teaching principles of digital games, as data collection tools bibliography with printed materials.

6. Method: The research was conducted within the framework of the scanning model [8], [9]. The study was based on the literature and based on quantitative data. In the findings of the study, the educational functions and requirements of digital games are first explained and then, how the digital games are prepared according to the teaching principles are explained.

7. Findings and Comments: In this section of the study, based on the literature (1) The functions of digital games in the early and middle childhood periods, (2) The requirements for digital games in the context of the teaching principles, and (3) the principles of teaching required in the preparation of digital games.

7.1. The functions of digital games in early and middle childhood periods

Children in the early childhood period (02-06 years); show the features of Learning the physical differences between the sexes, creating concepts for defining social and physical reality, learning the language, getting ready to read, distinguishing right and wrong, and starting the development of conscience.

Children in the middle childhood period (06-12 years); have the features of learning the physical skills necessary for everyday games, learning to live with peers, learning the appropriate masculine and feminine social role, basic skills related to reading, writing and calculating and having the necessary concepts for everyday life, developing a system of conscience, morality and values and reaching personal independence.

According to these developmental characteristics, digital games for children whose target audience is in preschool and middle childhood are expected to show the following functions, both can be entertaining and provide learning:

- should be appropriate for their discovery.
- should be relieving their curiosity.
- should be suitable for cooperation.
- should develop their problem solving skills.
- should develop their communication skills.
- should improve hand-eye coordination.

7.2. The requirements for digital games in the context of the teaching principles



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In this study, it was aimed to determine the target group of children between 04-06 and 06-12 age groups; in digital games, visual, auditory stimulating elements and animations are included, while basic teaching principles need to be constructed in an educational and holistic approach. In addition to activities in digital games, there is a need to include children's hand-eye coordination skills.

7.3. The principles of teaching required in the preparation of digital games: The teaching principles are explained below separately:

Principle 1- Digital games must be suitable for outcomes: The outcomes of Preschool Education Programme are the answer to the question of “Why are we educating children?” Outcomes are the desired features to be given to the student. In other words, it is desirable to be available in children to be trained, which can be gained through education [4], [5]. Outcomes are the objectives of teaching, a syllabus or a course. In other words, as the outcomes are the characteristics and behaviors that are required to be acquired by children, Digital games must have educational value as being an activity and that they must be suitable for the outcomes.

Example outcomes:

- S/he plays in harmony with his/her friends.
- S/he uses hand-eye coordination in games in harmony.

Principle 2- Digital games must have content that is appropriate for the outcomes: The messages in digital games must be set up based on outcomes. The benefit of delivering messages / content in a meaningful whole is to make the outcomes more effective. The lack of appropriate activities for children in the selection of messages is seen as an important problem.

Principle 3- Digital games should be appropriate for the child's level: The principle of relativity to the child is to recognize the student and to act according to his needs. Because every child has different features in terms of hereditary characteristics, environmental factors, speed and duration of learning, mental, physical and emotional development characteristics, socio-economic status, interests and expectations, age and intelligence. In case that the aforementioned factors, which affect readiness, are above the child's level of development, digital games can create a sense of failure in the child [1]. Playing a game far below the power of the child, with the idea of repeating known things, can blunt and even destroy the child's interest. Therefore, “the principle of relativity to the child” requires that children take into account the (1) Individual, (2) Social and (3) Educational readiness levels [11].

Principle 4- Digital games should be appropriate for the basic teaching principles: Teaching principles are pioneering ideas that guide and assure accuracy in the realization of the objectives, in planning and implementation of activities. When the



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digital games are prepared in accordance with the basic teaching principles, the following educational contributions are obtained:

- Outcomes can be achieved effectively.
- It guides to selecting, organizing, implementing and evaluating activities related to digital games.
- It enables digital games to be prepared according to the principle of phasing from concrete to abstract, known to unknown, simple to complex and step by step.

Principle 5- Digital games should be consistent with the basic elements of games:

The consistency of digital games depends on the integrity of the basic elements that make up the games. Games made in the understanding that only activity do not have educational value, as well as non-economic efforts in terms of time and labor. An example of the consistency of digital games in terms of basic elements is given in the table.

CHART

THE CONSISTENCY OF DIGITAL GAMES BETWEEN ITEMS

Basic Items	Outcome	Content	Educational Backgrounds/Activities	Evaluation
Scope	S/he recognizes body organs.	Heading organs	Finger game Chin, mouth, nose, eyebrows, eyes, forehead and hair are introduced with hand and finger movements and metaphors.	Heading organs with fingers 1.Their names are requested by showing. 2. The organs are asked to be shown by the given names.

When the table is analyzed, it is necessary to conduct the content that is suitable for the outcome, the following educational backgrounds and the evaluation in a complete and coherent manner. Thus it is understood that “Outcomes cannot be achieved with a non-standard educational flow”.

Principle 6- Digital games should be appropriate for the child's step-by-step progress:

The principle of step-by-step progress of digital games is to make the activities progressively in small steps. With step-by-step progress; the knowledge and experience of the previous step shall be established relationship. Permanent tracked learning increases by establishing links between what they have already learned and new steps. Therefore, digital games should include a sequential development and each



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new experience should be built on the previous one. This order should be from simple to complex, from abstract to concrete and from known to unknown.

Principle 7- Digital games should stimulate the child's sense of achievement:

According to Bruner; "information is not product; it is process." So learning is not a phenomenon. Therefore, instead of giving children ready information; by making them active, teaching processes should be followed to enable them to find information in examples, questions and activities. Because, instead of getting children ready for information; the effect of this approach is increased by organizing, taking advantage of, and taking into consideration the motives of being together with others [3].

Principle 8- Digital games should be appropriate for the learning speed of the child:

Learning is an inherent consequence of heredity, environment and time factors. Because, in all circumstances, learning is an individual process. For this reason, while the digital games that play an important role in child's learning life are planning, it is necessary to be arranged, gained and ranked according to the individual speed of the child.

Principle 9- Digital games should be able to improve the problem-solving skills of the child:

Contemporary education systems are aimed at providing problem solving skills. In this understanding, according to the principle of John Dewey's "School is life itself.", problems related to real life should be included in the preparation of digital games as with any educational activity. "The process design", which is widely used in pre-school education in the target group of digital games, cares to be gained "problem solving" skills to the child [6], [12].

According to Barry Beyer, the main goal in process design is; to provide a common environment for children to learn in the best way. The most important product of this approach is problem solving and critical thinking. Educational activities such as collaborative learning, creative thinking and decision making are also used in the process design.

Principle 10- Digital games should support children's sociability outcomes:

Children socialize with games. Digital games provide cognitive, mental and affective outcomes in children. Peer communication and interaction with digital games take place in the social environment. Social environment is important in cognitive development of children. Because; social environment is the basis of information, concepts and facts that children have learned. The social environment needs to be supported by digital games that will enable children to engage in social interactions [14].

Principle 11- The images and symbols used in digital games should be free of aggressive behaviors:

In visual design, images are the sensuous forms that are spontaneously animated in the minds of children. Symbols are a representation of symbols or symbols on a case or concept. Children learn while having fun with educational games [7]. The images and symbols to be included in the learning units should be chosen according to the level of the child and should not be violent. Because;

aggression is the most advanced and extreme form of behavior that disregards the wishes and social values of children. Children exhibiting aggressive behavior; they have a disrespectful and belligerent attitude in the form of tense and frustrated behavior, inability to establish relationships that are compatible with their peers and people around them, to live with other children. Therefore, images and symbols used in games should not contain offensive behavior.

Principle 12- Digital games should include animation, story, sound, examples, graphics and diagrams appropriate for the child's visual memory: According to the senses, the learning style, including visual, auditory and tactile, is of three types. According to individual differences in human memory, one learns according to all three learning styles. Visual learning memory is the kind of memory that every child uses intensively. Visual memory encodes and organizes the visual messages, which are presented to it, more permanently. Because children get the permanent traces from 30% of visual stimuli, 10% of reading and 20% of hearing [2]. In addition, digital games consisting of visual elements; it makes it easier for children to remember, to follow rules, to be regular and to follow a process with their eyes [10].

Principle 13- Digital games should develop children's imaginations: Imagination is the ability of the mind to create imagination, fantasy, phantasy. Phantasy is that people can visualize what they want. Relationships between past and present experiences are established by the imagination. The imagination increases with the fantasy. Even though objects are not seen by their imagination and they are not opposite, the ability to design them as if they were opposite and to see increases. For this reason, digital games should include elements that are designed to promote children's imaginations.



Figure: Elements Which Develops Children's Imagination

As seen in the figure, creative behavioral results should be revealed by using motivation, fantasy and psychological factors in developing children's imagination. Because; since 75% of gamification is psychology and 25% of it is new technologies, game mechanics must be a psychological and emotional reference in their designs and constructs [7], [13], [15].

Principle 14- Digital games should ensure that children use hand-eye coordination: Each child uses hand-eye coordination in his / her daily life. Hand-eye coordination facilitates compliance with existing environments, events and situations. Hand-eye coordination; as in every human being, in children, it is important and valuable in performing certain tasks in an activity, in nutrition, in eating, in drinking and in playing games. Because; it is necessary ability to follow the stimulus at the correct



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speed and intensity. Making pictures, writing and drawing is basically necessary skills for Hand-Eye Coordination. Children's hand eye coordination can be enhanced with banners, charts, boards that will be designed for digital games, illustrated and narrated with visual materials.

Principle 15- Digital games should allow children to self-assess: Self-assessment is an assessment by herself or himself. Self-assessment ensures an individual level of performance as an integral part of the self-review process. Self-evaluation is not a reward, inspection, compelling and mechanical process. Self-evaluation is based on the accuracy of learning outcomes as it is on the basis of innovative and development. Considering the educational benefits of self-assessment; children should be provided with self-evaluation through digital games.

8. Conclusions

In consideration of the data obtained from the study, the results are:

1-In the present literature on digital games, while the types of digital games, application examples, visual and auditory features are given, educational functions are ignored.

2-There is a lack of an approach related to the preparation of digital games according to basic teaching principles.

3-Digital games are widely constructed away from the outcomes, content and application elements which are suitable for children's levels.

4-Digital games do not reflect holistically the children's step-by-step progress, and therefore, the teaching principles from close to far, from concrete to abstract and from known to unknown.

Recommendations

According to the conclusions of the study, the followings are suggested:

1-Digital games should include visual and audio messages to facilitate the perception of children.

2-Digital games should support children's sociability gains.

3-Digital games should include animation, story, sound, examples, graphics and diagrams appropriate to the child's visual memory.

4-Digital games should be prepared in a design in which children can use hand-eye coordination in harmony.



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Bibliography

- [1] Akkoyunlu, B.(1998). Öğretim Yazılımları. **Çağdaş Eğitimde Yeni Teknolojiler**. Ünite: 4. Eskişehir: Anadolu Üniversitesi Yayınları : 1021; 49-63.
- [2] Alkan, C. (1998). **Eğitim Teknolojisi**. Ankara: Anı Yayıncılık.
- [3] Bruner, J. (1985). **Models of the Learner**. Educational Researcher. Cambridge Harward University Press. 14.
- [4] Demirel, Ö. (2004). **Kuramdan Uygulamaya Eğitimde Program Geliştirme** (7. Baskı), Ankara: Pegem A Yayıncılık.
- [5] Ertürk, S. (1972). **Eğitimde Program Geliştirme**. Ankara: Yelken Tepe Yayıncılık..
- [6] Glasgow, N.A. (1997). **New Curriculum for New Times. A Guide to Student-Centered Problem-Based Learning**. U.S.A. California: Corwin Press Inc. California 91320.
- [7] Groh, F. (2012). **Gamification: State of the Art Definition and Utilization**. In Proceedings of the 4th seminar on Research Trends in Media Informatics, 39-46.
- [8] Kaptan, S. (1983). **Bilimsel Araştırma Teknikleri ve İstatistik Yöntemleri**. Ankara: Tekışık Matbaası.
- [9] Karasar, N. (1991). **Bilimsel Araştırma Yöntemi**. Ankara: 3A Araştırma Eğitim Danışmanlık Ltd. Şti.
- [10] Karaağaçlı, M. (2017). **Öğretimde Teknolojiler ve Materyaller**. Ankara: Sonçağ Mataacılık Yayıncılık Reklam San. ve Tic. Ltd. Şti.
- [11] MEB (2015). **Okul Öncesi Eğitim Programları**. MEB. Talim ve Terbiye Kurulu Başkanlığı.
- [12] Savery, J.R. and Duffy, T.M. 1995; **Problem Based Learning: An Instructional Model and Its Constructivist Framework**. Educational Technology, 35, 31-38.
- [13] Williams, J. (2012). **The Gamification Brain Trust: Intrinsically Motivating People to Change Behavior (part 2)**. Gamesbeat, Panel discussion, Wallace, M. [chair]
- [14] Vygotsky, L.S. (1997). **Educational Psychology**. Boca Raton, FL: St. Lucie Press. Webster’s Encyclopedic Unabridged Dictionary of the English Language. New York, NY: Gramercy Books: 155-172.



International Child and Information Safety Congress
"Digital Games"
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[15] Zichermann, G. and Cunningham, C. (2011). **Gamification by Design Implementing Game Mechanics in Web and Mobile Apps**. Sebastopol, CA O'Reilly Media.



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Examination of Digital Game Habits of High School Students

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Abstract

Digital games are becoming more and more popular among today's students. Digital games are used directly or indirectly in many areas such as marketing and communication. In terms of education, digital games allow students to socialize and also provides students with the development of motivation and self-regulation skills. Digital games have become an important pedagogical tool thanks to such benefits. It is important to know the habits and preferences of the students who play digital games to get the best benefit in education. Because the habits and preferences of individuals playing digital games are seen as a cultural phenomenon. So it is necessary to know the preferences and the habits of learners in the target culture. The aim of this research is to analyze the digital gaming habits of high school students. This study is based on survey model. It was conducted in a province in Western Black Sea Region. It was carried out an Anatolian High School students. Participants of this research consist of 418 high school students. The survey was conducted by means of a questionnaire developed by researchers. This questionnaire contains questions about the demographic information of students and determination of the habits of playing digital games. In the analysis phase the percentage, frequency, mean and standart deviation were used. 49.2% of male students and 50.8% of female students participated in the research. 97.3% of the students have a smartphone but 2.7% of the students do not have a smartphone. Also 81.8% of the students have the smartphones with internet connection. When it comes to the frequency of playing digital games 33.7% of the students play digital games everyday, 14.1% play digital games three or four days a week, 25.3% play digital games one day or two days a week, 16.2% play digital games a few times a month. When it comes to the frequency of daily digital gaming 20.5% of students play digital games less than an hour, 21.7% of students play one or two hours, 9.6% of students play three or four hours, 1.2% of students play for five or six hours and 1.2% of students play 7 hours and more. When students are asked where to play their digital games, 50% of students play their digital games on the smartphone, 3.3% of students play digital games on tablet, 3.3% of students play digital games on game console, 6.2% of students play digital games on PC, 34.4% of students play on their laptops. 72.2% students who play digital games say that they play single-user digital game. 27.3% of students say that they play multi-user digital games. When it comes to multi-user digital games, 0.7% of



students say that they play with their parents, 23.4% of students say that they play with their friends, 75.9% of students say that they play with unfamiliar people on the internet. 19.1% of students say that they go to the internet cafe to play digital games. When the findings obtained from research are examined, it is understood that the most majority of high school students have a smartphone with internet connection. Also half of the students play their digital games through the smartphones. These findings can be considered as an important opportunity for the applicability of mobile learning and mobile educational games. When the frequency of students playing digital games is examined, it is determined that one of every three students play a digital game everyday. While most of the students are playing single-user digital games, multi-user digital games are played with unfamiliar people on the internet. There is a possibility that students will be able to cope with unwanted situations and behaviors such as bullying while playing unfamiliar people on the internet. There is not a lot of students who play multi-user digital games with their family. This finding points to the inadequacy of parental control in multi-user digital gaming environments. As a result of research findings, it has been discussed what can be done about the digital game playing habits of students and various suggestions have been made to families, applicants and policy makers.

Keywords: High school students, Digital game playing, habits

1.Introduction

Playing games is a very important activity for children as well as being a tool to express themselves comfortably (Sormaz & Yüksel, 2012). During playing games, children gain experience to support the development of social, emotional and motor skills (De Grove, Bourgonjon, & Van Looy, 2012). In parallel with the digitalization of almost everything in our age, it is seen that games and game tools are affected by this change and take place in children's lives (İnan & Dervent, 2016). Digital games have become used directly or indirectly in many areas such as marketing, communication. It is seen that today's children are rapidly adapting to this development in technology (Pala & Erdem, 2011).

In terms of education, it can be said that games attract more attention of new generation children according to traditional learning methods. In their study Sarı and Altun (2016) found that in courses with elements of gamification students' interest and motivation towards the courses increased and their wishes about their participation in the course increased. Considering the positive effects of digital games on children, it can be said that educators are more interested in using games in teaching (Çağlar & Arkün Kocadere, 2015). Yildiz Durak, Karaoglan Yilmaz and Yilmaz (2017) have determined that they play Dress Up / Make Up Games, Information / Logic Games, Car / Racing / Sports Games, Strategy / War / Adventure Games, Educational Games, Build, Multiplayer Games, Card Games and Simulation Games. In addition, it was examined whether or not the students have changed their computational thinking skills according to the type of play they play. Research findings indicate students' algorithmic thinking, cooperativity



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and problem solving levels display a statistically significant difference based on the type of game that they play. To make the best use of digital games as a teaching method, it is important to know the habits and preferences of the learners to play. Because the habits and preferences of individuals playing digital games are seen as a cultural phenomenon. So it is necessary to know the preferences and the habits of learners in the target culture. The aim of this research is to analyze the digital gaming habits of high school students.

2. Method

In this part of the study, it's given the model of the researcher, the data collection tools, the analysis of the data and the interpretation of the data.

Research Model

This study is based on survey model. Survey model studies are the researches that aim to collect data to determine specific characteristics of a group. These studies are determining the various characteristics of the participants such as opinions, interests, skills, attitudes etc. related to a subject or event (Büyüköztürk et al., 2016). This study was conducted on Anatolian High School students in a province center in Western Black Sea Region during the spring semester of 2016/2017 academic year. Participants of this research consist of 418 high school students.

Data Collection Tools

The survey was conducted by means of a questionnaire developed by researchers. This questionnaire contains questions about the demographic information of students and determination of the habits of playing digital games

Analysis of Data

The data were analyzed by descriptive statistical method and the percentage, frequency, mean and standart deviation were used.

3. Results

Purpose of this study is to analyze the digital gaming habits of high school students. In this section, the distribution of the students by gender, the status of having a smart phone, the status of internet connection in their smart phones, the frequency of digital game play, the devices in which they play digital games and the type of digital games they play are analyzed.

The distributions of the students participating in the study by gender are shown in Figure 1. As seen in Figure 1, 50.8% of the students are female and 49.2% are male.

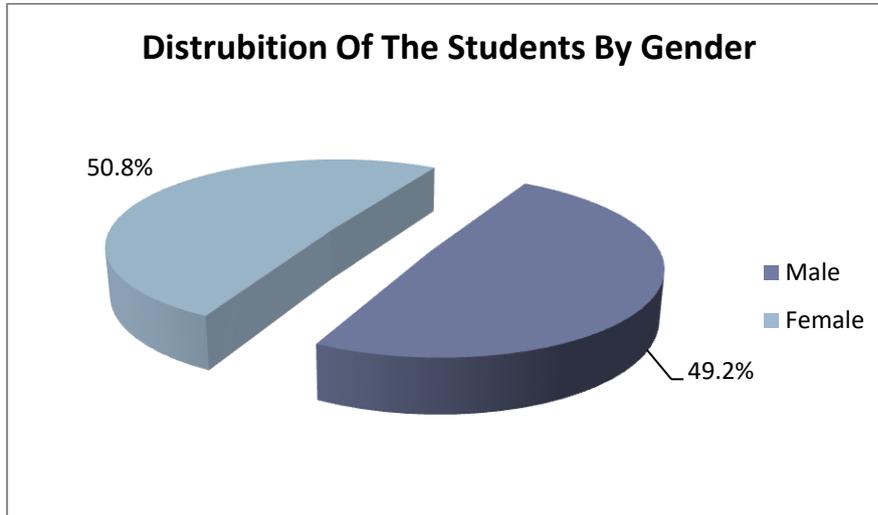


Figure 1. The distributions of the students by gender

The rate of students who have a smart phone is as shown in the Figure 2. According to the figure, almost all of the students (97.3%) have smart phones. Only 2.7% of students do not have a smartphone.

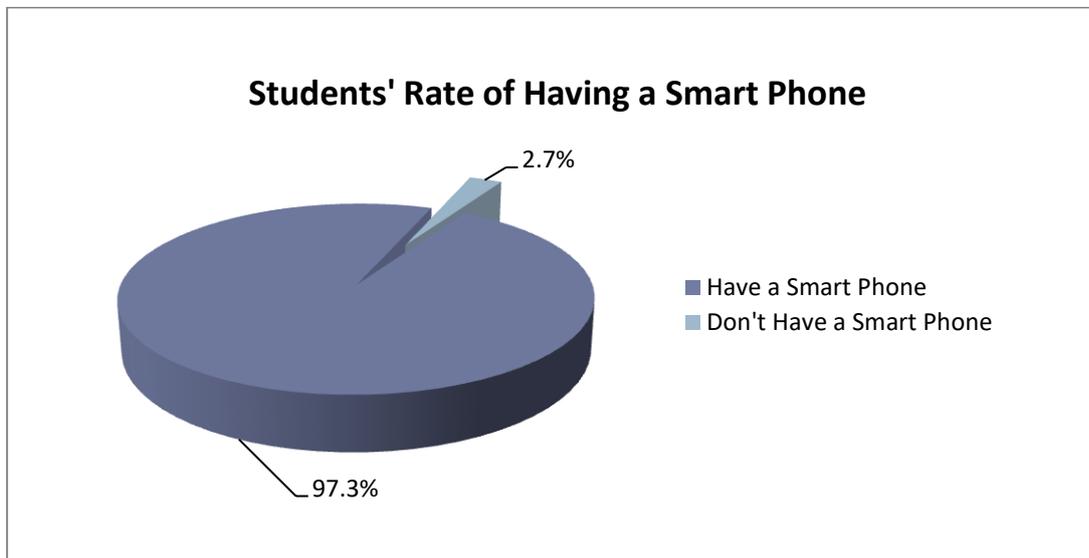


Figure 2. Students' rate of having a smart phone

Internet connection status on students smartphones are shown in Figure 3. According to the figure, more than half of the students have an internet connection on their smart

phones (81.8%). 18.2% of students do not have internet connection on their smart phones.

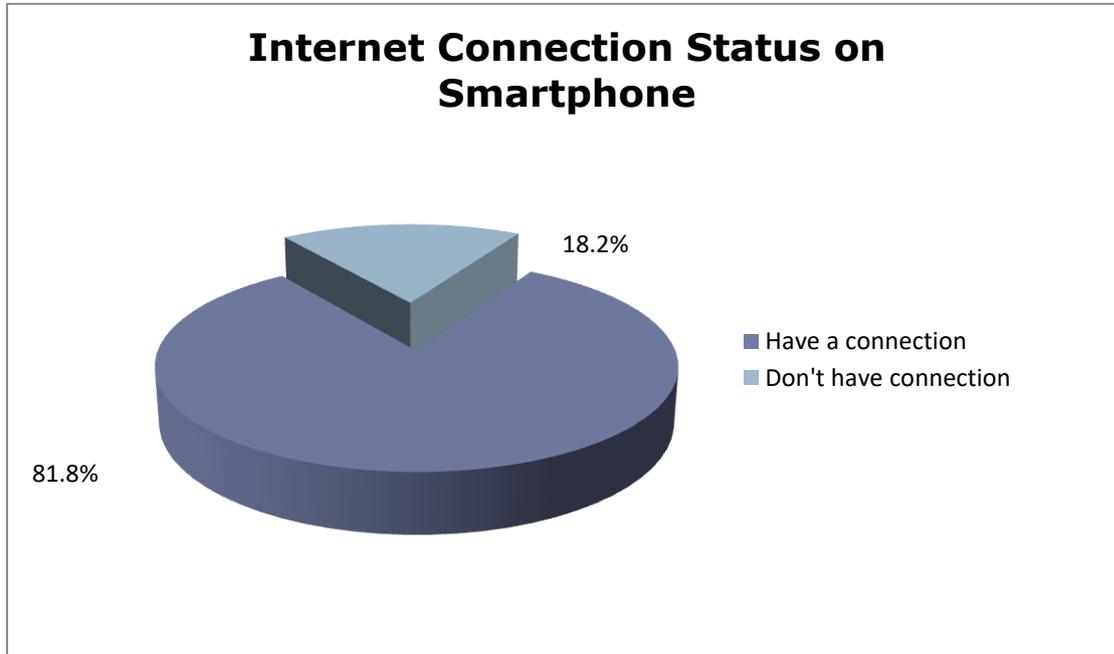


Figure 3. Internet connection status on students smartphones

Distribution of students according to their digital play frequency are shown in Figure 4. According to the figure, 33.7% of the students play digital games everyday, 14.1% play digital games three or four days a week, 25.3% play digital games one day or two days a week, 16.2% play digital games a few times a month.

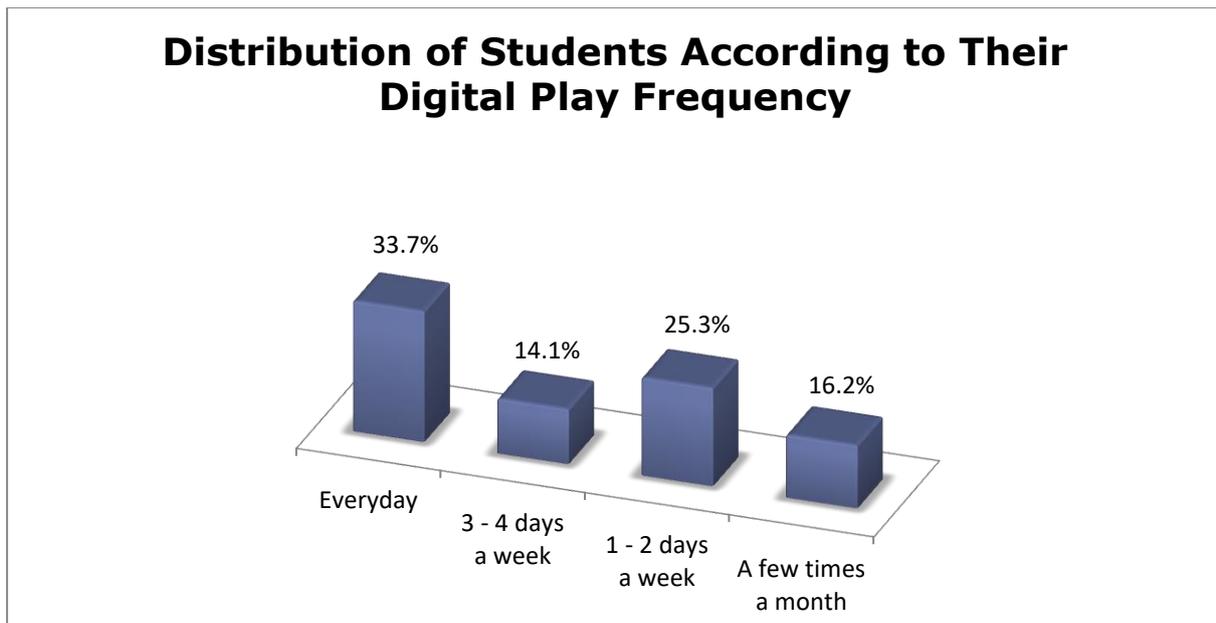


Figure 4. Distribution of students according to their digital play frequency

Distribution of students according to their daily digital gaming frequency are shown in Figure 5. According to the figure, 20.5% of students play digital games less than an hour, 21.7% of students play one or two hours, 9.6% of students play three or four hours, 1.2% of students play for five or six hours and 1.2% of students play 7 hours and more.

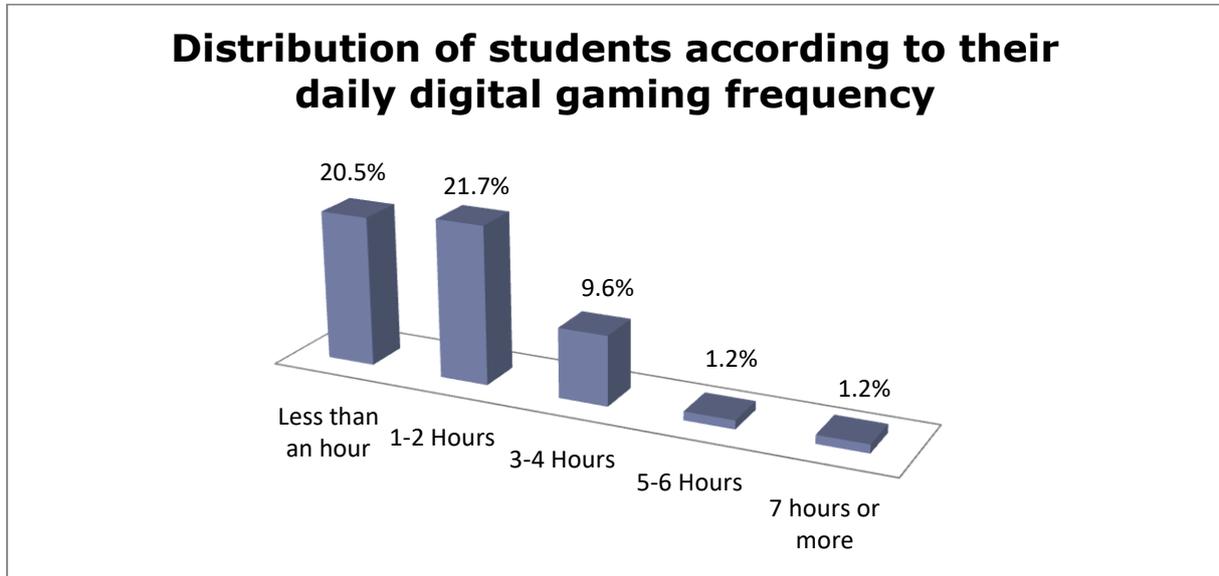


Figure 5. Distribution of students according to their daily digital gaming frequency

Distribution of devices where students play digital games are shown in Figure 6. 50% of students play their digital games on the smartphone, 3.30% of students play digital games on tablet, 3.30% of students play digital games on game console, 6.20% of students play digital games on PC, 34.40% of students play on their laptops.

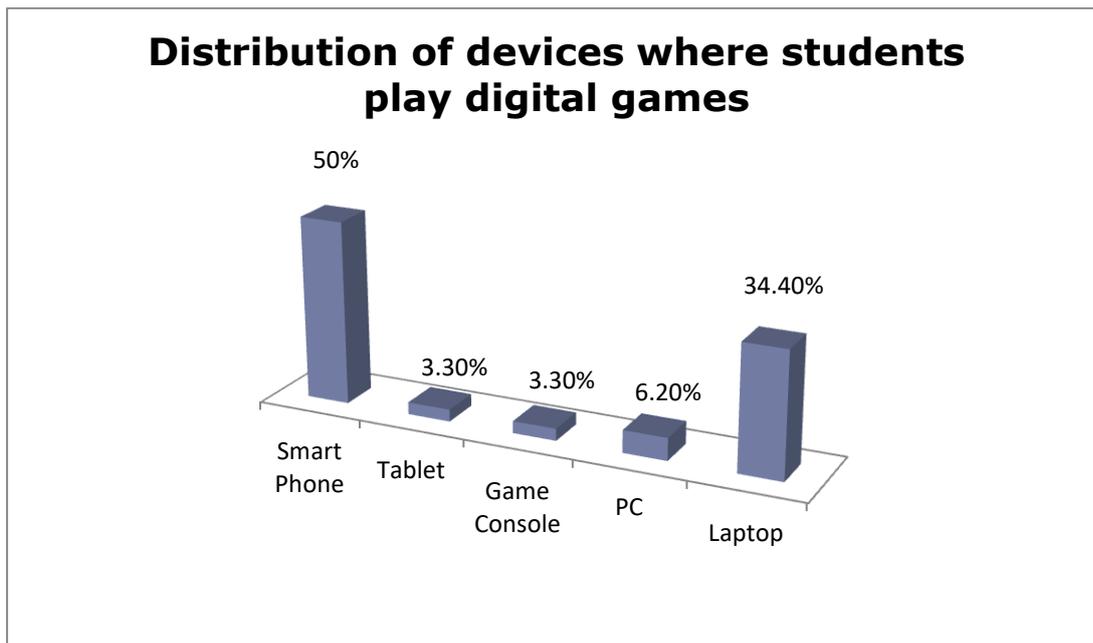


Figure 6. Distribution of devices where students play digital games

Distribution of single-user or multi-user digital game type are shown in Figure 7. According to the figure, 72.2% students who play digital games say that they play single-user digital game. 27.3% of students say that they play multi-user digital games.

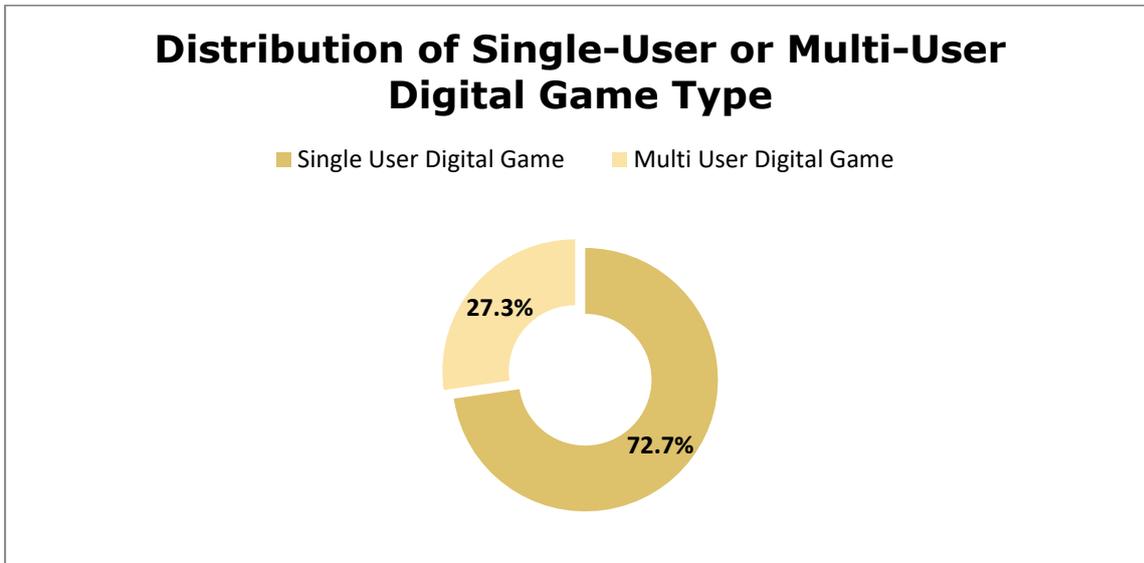


Figure 7. Distribution of single or multi user digital game type

The following findings have been reached when multi-user digital games are reviewed. 0.7% of students say that they play with their parents, 23.4% of students say that they play with their friends, 75.9% of students say that they play with unfamiliar people on the internet. Distribution of with whom the students play the multi-user games are shown in Figure 8.

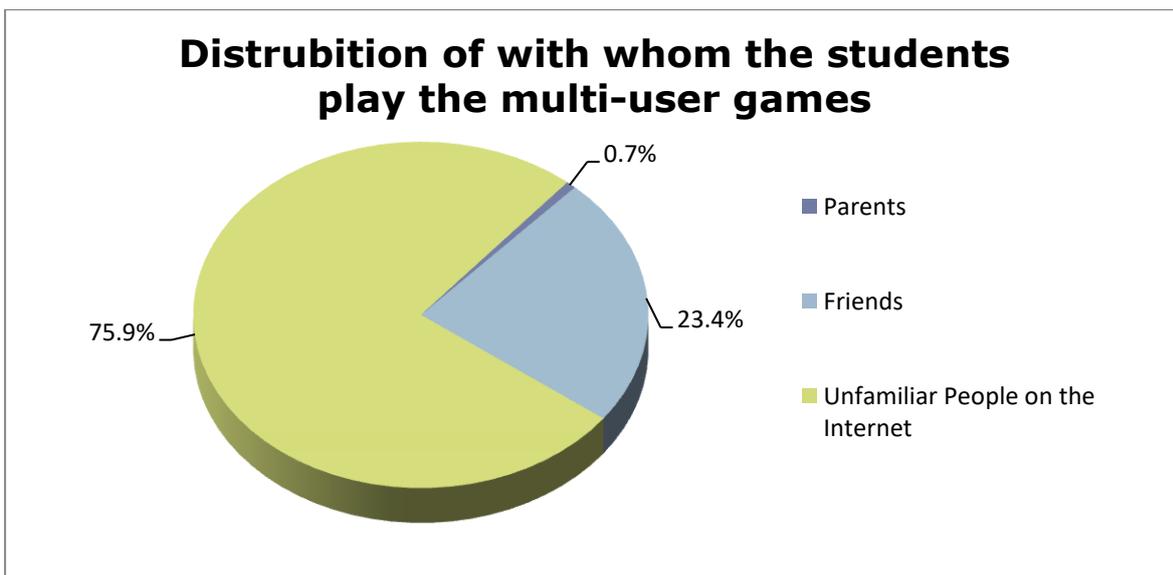


Figure 8. Distribution of with whom the students play the multi-user games



4. Discussion and Conclusion

The aim of this research is to analyze the digital gaming habits of high school students. This study is based on survey model. It was conducted in a province in Western Black Sea Region. It was carried out an Anatolian High School students. Participants of this research consist of 418 high school students. The main results obtained from the research are as follows. 97.3% of the students have a smartphone but 2.7% of the students do not have a smartphone. Also 81.8% of the students have the smartphones with internet connection. Karaođlan Yılmaz, Dilen and Durmuş (2018) determined that 88.7% of high school students had internet access. This shows that most of today's students have internet access. These findings are important opportunities for self-directed learning with technology. These chances can be evaluated and learning opportunities can be provided with self-directed learning with technology. Research shows that self-directed learning with technology is an important predictor of academic motivation (Yılmaz, Karaoglan Yılmaz, & Cavus Ezin, 2018). In addition, Karaođlan Yılmaz (2016) did not find a significant difference in self-directed learning with technology in his study of whether he had made a difference in students with deep and surface learning approach. In the future, learning environment designs can be made by considering these findings in studies to be performed with high school students. When it comes to the frequency of playing digital games 33.7% of the students play digital games everyday, 14.1% play digital games three or four days a week, 25.3% play digital games one day or two days a week, 16.2% play digital games a few times a month. When it comes to the frequency of daily digital gaming 20.5% of students play digital games less than an hour, 21.7% of students play one or two hours, 9.6% of students play three or four hours, 1.2% of students play for five or six hours and 1.2% of students play 7 hours and more. When students are asked where to play their digital games, 50% of students play their digital games on the smartphone, 3.3% of students play digital games on tablet, 3.3% of students play digital games on game console, 6.2% of students play digital games on PC, 34.4% of students play on their laptops. 72.2% students who play digital games say that they play single-user digital game. 27.3% of students say that they play multi-user digital games. When it comes to multi-user digital games, 0.7% of students say that they play with their parents, 23.4% of students say that they play with their friends, 75.9% of students say that they play with unfamiliar people on the internet. 19.1% of students say that they go to the internet cafe to play digital games. When the findings obtained from research are examined, it is understood that the most majority of high school students have a smartphone with internet connection. Also half of the students play their digital games through the smartphones. These findings can be considered as an important opportunity for the applicability of mobile learning and mobile educational games. When the frequency of students playing digital games is examined, it is determined that one of every three students play a digital game everyday. While most of the students are playing single-user digital games, multi-user digital games are played with unfamiliar people on the internet. There is a possibility that students will be able to cope with unwanted situations and behaviors such as bullying while playing unfamiliar people on the internet. There is not a lot of students who play multi-user digital games with their family. This finding points to the inadequacy of



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parental control in multi-user digital gaming environments. Karaođlan Yılmaz and Çavuş Ezin (2017) indicate that through the necessary institutions and organizations to prevent damage to parents and children, preventing and raising awareness is required.

References

Büyüköztürk, Ş., Çakmak, E. K., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2016). *Bilimsel araştırma yöntemleri* (22 b.). Ankara: Pegem Akademi.

Çağlar, Ş., & Arkün Kocadere, S. (2015). Çevrimiçi öğrenme ortamlarında oyunlaştırma. *Eğitim Bilimleri ve Uygulama*, 14(27), 83-102.

De Grove, F., Bourgonjon, J., & Van Looy, J. (2012). Digital games in the classroom? A contextual approach to teachers' adoption intention of digital games in formal education. *Computers in Human Behavior*, 28(6), 2023-2033.

İnan, M., & Dervent, F. (2016). Dijital bir oyunun hareketli hale dönüştürülmesi: öğrencilerin uyarlanmış hareketli versiyona verdiği tepkilerin incelenmesi. *Pegem Eğitim ve Öğretim Dergisi*, 6(1), 113-132.

Karaođlan Yılmaz, F. G. (2016). Examining self directed learning with technology based on different learning approaches. Presented at the *International Academic Conference on Teaching, Learning and E-learning*, Budapeşte.

Karaođlan Yılmaz, F. G., & Çavuş Ezin, Ç. (2017). Ebeveynlerin bilgi güvenliği farkındalıklarının incelenmesi. *Eğitim Teknolojisi Kuram ve Uygulama*, 7(2), 41-57, <https://doi.org/10.17943/etku.288874>.

Karaođlan Yılmaz, F. G., Dilen, A., & Durmuş, H. (2018). Lise öğrencilerinin mobil öğrenme araçlarını kullanma öz-yeterlik düzeylerinin incelenmesi [The examination of high school students' self-efficacy levels of mobile learning tools]. *SDU International Journal of Educational Studies*, 5(1), 1-12.

Pala, F., & Erdem, M. (2011). Dijital oyun tercihi ve oyun tercih nedeni ile cinsiyet, sınıf düzeyi ve öğrenme stili arasındaki ilişkiler üzerine bir çalışma. *Ahi Evran Üniversitesi Eğitim Fakültesi Dergisi*, 12(2), 53-71.

Sarı, A., & Altun, T. (2016). Oyunlaştırma yöntemi ile işlenen bilgisayar derslerinin etkililiğine yönelik öğrenci görüşlerinin incelenmesi. *Turkish Journal of Computer and Mathematics Education*, 7(3), 553-577.



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Sormaz, F., & Yüksel, H. (2012). Değişen çocukluk, oyun ve oyuncağın endüstrileşmesi ve tüketim kültürü. *Gaziantep Üniversitesi Sosyal Bilimler Dergisi*, 11(3), 985-1008.

Yildiz Durak, H. , Karaoglan Yilmaz, F. G., & Yilmaz, R. (2017). Examining the Relationship between digital game preferences and computational thinking skills. *Contemporary Educational Technology*, 8(4), 359-369.

Yilmaz, R., Karaoglan Yilmaz, F. G., & Cavus Ezin, C. (2018). Self-directed learning with technology and academic motivation as predictors of tablet pc acceptance. In *Handbook of Research on Mobile Devices and Smart Gadgets in K-12 Education* (pp. 87-102). IGI Global.



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Identity Seeking in Digital Games

Dijital Oyunlarda Kimlik Arayışı

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Abstract: Identity is a term that clearly or implicitly implies who the person is in general. Prior to today’s digital transformation, identity development was being built in a relatively restricted area based on existing physical realities and past experiences. The widespread use of social platforms has allowed individuals to interact more with other peoples. These social platforms can be real physical worlds as well as virtual. The boundaries between real and virtual are increasingly blurred with today’s technology. Thus, virtual world users can create new virtual identities by formatting their images (avatars and profiles etc.) according to their wishes. Virtual platforms with no limitations, such as physical facts, constraints or penalties, create an environment in which individuals can create their virtual identity as they desire.

The virtual identity has a wide range of effects on digital games as well as on virtual worlds. In digital games, players who creating their own virtual identity through avatars can use different symbolic materials as they wishes. Therefore, the virtual identities used mostly in children’s digital games have an undeniable precaution in the examination of children’s identities. For this reason, it is necessary to examine not only the physical identities that appear in the examination of children’s psycho-social developments but also the virtual identities in digital games. What is crucial here is how the virtual identity will hold the difference between the true-identity and the identity-represented to others. It is thought that the virtual identity created in digital games was created no to reflect the real physical characteristics of the individual, but to take steps in different worlds with different capacities and features. Virtual identities which used in digital games can be online or offline. Virtual identities created in offline games allow different identities to be created completely independent of the real world. In addition, in online games type of Massively Multiplayer Online Role-Playing (World of Warcraft etc.), players could found in share in connection with their real identity via online on social networks. This difference in online and offline virtual identities has also affected the ability of players to create avatars, depending on the connection between physical identities and virtual identities. On the basis of this situation, it is thought that the experience of interaction based on mutual-influence and influence in games is considered. The taking of experience as a basis for identity formation removes the differences of experience in the virtual world from the real world. In digital games, allowing players to manage their own avatar, determining new targets based on reactions from other players and moving towards this goal; provides players with the experience to gain experience and develop their identity depending on experience. It is



stated that the identity that develops due to the interaction and experimentation in the digital games arises from the union between the individual and the avatar, not from the source but from the unification. In other words, choosing an avatar independent of their gender in a player’s digital vote does not reflect the tendency to be the other gender. The reason for this preference, the mission in the game may require such an avatar selection.

Another dimension to be examined for virtual identity in digital games is the ability to make the behaviors that they are away from their Daily lives through virtual identities due to freedom and anonymity in virtual worlds. Individuals who do not commit crimes in the real world are experiencing criminal activity with the freedom of their virtual identities and the gaming environment in games (GTA etc.) that have experienced criminal experiences. This experience helps people to reveal their repressed feelings and provide them with pleasure. It is thought that this situation normalizes the crime which can be easily processed in the virtual environment. Within this period, it is thought that the individual can internalize dangerous virtual identities in digital games and may lead to criminal experience in the real world. In sum, it is thought that the difference between the real identity, which keeps away from the crime in the real world, and the virtual identity that enjoys the crime in the digital games may lead to the division of identities of the players. In such a case, the players can manage the real identity and virtual identity according to the needs of the environment. Therefore, it is important to investigate the virtual identity that is influenced by experiences in digital games and how they reflect on the real identity of the players and it should be examined empirical studies.

Keywords: Digital game, identity, virtual identity.

Özet

Kimlik, genel anlamda kişinin kim olduğuna ilişkin açık veya örtük anlamları içeren bir kavramdır. Günümüzde yaşanan dijital dönüşümün öncesinde, kimlik gelişimi mevcut fiziksel gerçeklikler ve geçmiş deneyimlere dayalı olarak; nispeten kısıtlı bir alanda inşa edilmekteydi. Sanal ortamların yaygınlaşmasıyla birlikte, bireylerin başkalarıyla sanal ortamda daha çok etkileşime girerek deneyim yaşamalarına olanak sağlamış ve kimlik gelişimi sanal ortama da taşınmıştır. Bu sosyal ortamlar; gerçek fiziksel dünyalar olabileceği gibi sanal dünyaları da içermektedir. Günümüzde teknoloji ile gerçek ve sanal arasındaki sınırlar giderek bulanıklaşmaktadır. Böylece sanal dünya kullanıcıları sanal ortamdaki imajlarını (avatar ve profil vb.) kendi isteklerine göre biçimlendirerek yeni sanal kimlikler oluşturabilmektedirler. Fiziksel gerçekler, kısıtlamalar veya ceza gibi sınırlamaların olmadığı sanal ortamlar bireylere sanal kimliklerini istedikleri şekilde oluşturabilecekleri bir ortam yaratmaktadır.

Sanal kimliğin; sanal dünyalara olduğu gibi dijital oyunlara da geniş yansımaları bulunmaktadır. Dijital oyunlarda avatarlar yardımıyla kendi sanal kimliğini oluşturan oyuncular, farklı sembolik materyalleri diledikleri gibi kullanabilmektedirler.



Dolayısıyla çoğunlukla çocukların oynadığı dijital oyunlarda kullanılan sanal kimlikler; çocukların psiko sosyal gelişimlerinin incelenmesi açısından önemli bir yer tutmaktadır. Bu nedenle çocuklarla ilgili yapılacak değerlendirmelerde sadece görünen fiziksel kimliklerinin değil dijital oyunlardaki sanal kimliklerin de ele alınması gerekmektedir. Burada önemli olan nokta ise, gerçek kimlik ile başkalarına sunulan kimlik arasındaki farklılıkta sanal kimliklerin nasıl bir yer tutacağıdır. Dijital oyunlarda oluşturulan kimliğin; bireylerin gerçek fiziksel hayattaki özelliklerinin artırılması için değil, farklı kapasitelere ve özelliklere sahip olan farklı dünyalara adım atmak için oluşturulduğu düşünülmektedir. Dijital oyunlarda kullanılan sanal kimlikler çevrimiçi veya çevrimdışı olabilmektedir. Çevrimdışı oyunlarda oluşturulan sanal kimlikler gerçek dünyadan tamamen bağımsız olarak farklı kimliklerin oluşturulabilmesine izin vermektedir. Bunun yanında “Massively Multiplayer Online Role-Playing” türündeki çevrimiçi oyunlarda (World of Warcraft vb.) oyuncular sosyal paylaşım ağlarında çevrimiçi olarak gerçek kimlikleriyle bağlantılı şekilde paylaşımlarda bulunabilmektedirler. Çevrimiçi ve çevrimdışı sanal kimliklerdeki bu farklılık oyuncuların fiziksel kimlik ile sanal kimlikleri arasındaki bağlantıya bağlı olarak avatar oluşturmalarını da etkilemiştir. Bu durumun temelinde ise, oyunlardaki karşılıklı etkileme ve etkilenmeye dayalı deneyim olgusunun yer aldığı düşünülmektedir. Kimlik inşasında deneyimin temele alınması; gerçek dünya ile sanal dünyalardaki deneyim farkını ortadan kaldırmaktadır. Dijital oyunlarda oyuncuların kendi avatarlarını yönetmeleri, diğer oyunculardan gelen tepkilere bağlı olarak yeni hedefler belirlemeleri ve bu hedef doğrultusunda hareketlerine yön vermeleri; oyuncuların deneyim kazanmalarını ve kimliklerini deneyime bağlı olarak geliştirmelerini sağlamaktadır. Dijital oyunlardaki etkileşime ve deneyime bağlı olarak gelişen kimliğin; birey ile avatarı arasında bir özdeşleşmeden kaynaklı değil birleşmeden kaynaklı olarak oluştuğu belirtilmektedir. Diğer bir ifadeyle bir oyuncunun dijital oyunda kendi cinsiyetinden bağımsız bir avatar seçmesi diğer cinsiyete olan eğiliminin sonucu değil; oyundaki görevin böyle bir avatar tercihinin gerektiriyor olmasıdır.

Dijital oyunlardaki sanal kimliğe yönelik incelenmesi gereken bir diğer boyut ise; sanal dünyalardaki özgürlükten ve anonimlikten kaynaklı olarak, oyuncuların günlük yaşamlarında uzak oldukları davranışların sanal kimlik aracılığıyla yapılabilmelerine olanak tanınmasıdır. Gerçek dünyada suç işlememiş bireylere suç deneyimi yaşatan (GTA vb.) oyunlarda, oyuncular sanal kimliklerinin ve oyun ortamının sunduğu özgürlükle suç işlemeyi deneyimlemektedirler. Bu deneyim, bireylerin bastırılmış duygularını ortaya çıkarmalarına yardımcı olmakta ve kuralsız davranışlardan haz almalarını sağlamaktadır. Sanal ortamdaki kuralsızlığın suçu normalleştirdiği de düşünülmektedir. Bu süreçte bireyin dijital oyunlarda büründüğü tehlikeli sanal kimlikleri içselleştirebilecekleri ve gerçek dünyada da suç deneyimine yönelebilecekleri düşünülmektedir. Özetle, gerçek dünyada suçtan uzak duran gerçek kimlik ile dijital oyunlarda suçtan zevk alan sanal kimlik arasındaki farklılığın, oyuncularda kimlik bölünmesine yol açabileceği düşünülmektedir. Böyle bir durumda ise oyuncular gerçek ile sanal kimliğini ortamın gerekliliğine göre yönetebilmektedirler. Dolayısıyla dijital oyunlardaki deneyimlerden etkilenen sanal kimliğin; oyuncuların gerçek kimliklerine



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nasıl yansımaları olduđu araştırılması ve deneysel çalışmalarla incelenmesi gereken önemli bir konu olarak dikkat çekmektedir.

Anahtar Kelimeler: Dijital oyun, kimlik, sanal kimlik.



The Negative Effects of Digital Gaming on Children's Health and Development

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Objectives: Today, digital technologies are used in many areas such as education, health and entertainment. One of the most common among digital technologies is digital games. Digital games are usually played for leisure, entertainment and pleasure. Digital games, which are quite common among children, have the benefits of entertainment, enjoyment and learning, but their damages such as digital play dependency are also a serious threat. Digital games can be played on consoles, tablets, smartphones and computers. It is discussed how digital games affect these developmental areas by considering the physical, emotional, language and cognitive development of this age group. The proliferation of digital gaming usage areas, and especially the increasingly restricted use of outdoor playgrounds, is becoming an indispensable part of children's daily lives and is thought to cause not only positive but also negative effects on children. In this context, it is believed that children's screen dependence and the prolonged time spent on digital games lead to reduced face-to-face communication with their peers, resulting in decreased group play and increased solo play. However, it is thought that children play digital games in inappropriate content, time, frequency and different posture positions, and they cause health risks such as developmental problems, musculoskeletal system problems, physical inactivity. For this reason, the aim of our study was to investigate the adverse effects of digital play on children's health and development.

Methods: The study was conducted between January 4 - March 4, 2018 on the basis of the opinions of 139 parents aged 7-15 years. A questionnaire prepared by the researchers was used to evaluate parents' potential adverse health effects of their children's digital gaming on 11 questions. Responses given by the parents to the questions were recorded and analyzed.

Results: The average age of the parents participating in the study was 40.6 ± 6.3 years. It was determined that 9,6% of the parents' education levels were at the level of the postgraduate, 50,4% at the bachelor level and 20,1% at the high school level. The average age at which children start playing digital games is 4.5 ± 1.6 years. It was determined that the digital play time of the children during the day was 112.9 ± 95.7 minutes. Children participating in the study, 65.7% of them played in the computer, 72.1% in the mobile phone, 85.2% in the tablet and 24.5% in the game console. According to parents, playing digital games negatively affects children's health and development; 87.1% said that playing digital games for a long time is addictive to children, 74.8% of violent games cause aggressive attitudes by affecting the mood of



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children, 72.5% affected spinal health in the negative direction due to postural disorders, 70.0% cause dryness, pain and redness in the eyes, 69.7% of them cause socialization and decrease in intra-family communication, 62.2% lead to sleep disorders such as late sleep, late waking and a decrease in sleep duration, 58.2% reduce physical activity and trigger obesity, 57.8% cause distractibility and impaired concentration in children, 45.2% cause head and neck pain, 41.3% of the children reported that their children had musculoskeletal problems on their shoulders, elbows, wrists and fingers, 37.1% reported that they were experiencing limping and developmental retardation in language development.

Conclusion: According to the findings of the study, it was seen that the children who play digital games have fallen as early as the preschool period and spend up to two hours in the day for this activity. According to parents, playing digital games is addictive as negative effects on children's health and development, causes aggressive attitudes, negatively affects spine health, causes dry eyes, causes pain and redness, causes sleep disorders, decreases physical activity level and triggers obesity have been reported as the most important problems. We think that it is important that the duration, frequency, and content of digital gaming are monitored by parents in order to improve healthy life in children.

Keywords: digital game, technology, child, health problems, parents



The Relationship between Digital Game Addiction and Personal Qualities and Achievement

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Abstract

Digital games are electronic games that people interact with through an interface. Gaming platforms (mobile phones, tablets, etc.), which have improved the portability and the ability to connect to the internet at any time and place, have become very popular. Starting from very young ages, research conducted on digital games played by all age groups shows that one out of every six people in the world plays these games. In Turkey, it is stated that the number of digital games played as of 2016, reaching 30 million of those.

Extremely devoted behavior to digital games by children or young people (parents, educators, policy makers, etc.) has become one of the major sources of concern. At the heart of this concern addiction and wrong play choices can affect both the psychological situation and the social behavior of children and adolescents negatively, regardless of the age. Psychosocial negativities such as aggressive behavior, showing tendency to violence, desensitization towards violence, loneliness and anxiety are the main causes of these negativities.

Although digital games are said to have positive aspects such as mutual sharing, goal setting, reasoning, concentration, decision making and encouraging desire for achievement, another important negative result of game addiction can be observed in the education life of the students. These negativities arise as behaviors such as unattendance in school, uncompleted home works, and failed exams.

In this study, it is aimed to compare the individual characteristics of young people with and without gaming addiction to their success and to find new evidence on the subject. The survey was collected from 446 university students who are still attending their education. Data collected with a scale consisting of items including the behaviors and emotions before, during and after the game are statistically grouped with the help of clustering analysis. As a result of the conducted clustering analysis, the research sample is divided into three groups. These groups are; game addicts (addicts), tendencies to be addicted (candidates) and conscious actors (conscious). In terms of the items included in the scale, those who are in the addicts group have values well above the mean values, while those who are in the candidate group have values that are partially above the averages.



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In the comparison analyzes carried out among the emerging groups, no difference was found in terms of income, age and weight problem. On the other hand, it was found that approximately two-thirds of the members of the addiction were men. It is also seen that there is a difference between the groups in terms of the age of starting with the game in digital environment and the number of activities performed per week.

In addition, it is found out that, in terms of performance variables, as the game addiction statistically increases (study group of addicts and candidates), the study hours decreased and the general academic average decreased compared to the conscious group. Another important finding in the study is that digital gaming addicts and addicted candidates did not accept themselves as failing in terms of the course.

Key Words: Digital gaming, Game addiction, Academic achievement

Introduction

The research carried out on digital games played by each age group indicates that, approximately one out of every six people in the world have been playing this game, while in Turkey the number of people playing digital games for the year 2016 reached 30 million [1]. In the assessment published by WCP [2], the total number of game users worldwide is approximately 1.5 billion people. In the game market, the revenues of mobile games were approximately 20 billion dollars as of 2015, while the 2020 expectation levels increased to over 30 billion dollars.

Considering the number of players and their economic size, the digital game industry, which has the potential which cannot be ignored for all countries, also has threats. Individuals who exhibit extreme behaviors against digital games, regardless of children or young people, is seen to be associated with drug addiction [3], according to some researchers. Today, it is one of the most important sources of concern of many sectors (educators, policy makers, etc.), especially for parents. The basis of this concern is the fact that digital games can affect both psychological status and social behavior of children and young people in a negative way because of their social life.

One of the most important negative consequences of game addiction is observed in the educational life of students. This often occurs in the form of behaviors such as not taking time for school lessons, not doing homework, not studying for exams. Anderson and Dill examined the effect of violent games on variables related to aggressiveness and found that violent video games were positively related to aggressive behavior and guilt, the relationship felt stronger in male players and academic achievement was negatively related to the total time spent on games [4]. Again, Wright [5] found that digital gamers had a lower academic average than those who did not play, and Anand [6] found that video games had a detrimental effect on the academic average. In the literature, there are studies showing that there is a negative relationship between digital play and



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academic performance as well as some studies showing that there is no relationship [7, 8].

In this study, young people (university students) are focused on for digital gaming (console, computer or mobile regardless of) and it is aimed to detect patterns of behavior, to investigate whether there is a relationship between personal characteristics and academic achievement with this model and to search for new evidence from Turkey on the issue.

Research Methodology

Sampling and Data Collection Tool

Data were collected from university students using a standard questionnaire. In the first part of the questionnaire form, the participants were asked questions (such as age, income) as well as personal (weight problem, academic average) data in order to see the effects of digital addiction on performance. In the other part of the questionnaire, the scale prepared to measure digital gaming addiction.

In order to measure digital gaming addiction, a scale with 22 items was designed by taking into account the scales used in the addiction studies developed by Lemmens et al. [9], Irmak and Erdoğan [10, 11], Hussain et al. [12], Hazar and Hazar [13] and Young [14] in the first place, taking into account the behaviors of the respondent before, during and after the play, and the attitudes and behaviors of those around him / her. However, due to the feedback from the experts and respondents during the pilot study, it is seen that the same meaning was derived from some items and some items could be seen in also non-gamers, scale is decreased to 17 items. In order to measure game addiction, five-point Likert rating (1 = never; 2 = rarely (very rare); 3 = sometimes; 4 = most of the time; 5 = always) was used.

Since a comprehensive study was carried out on digital addictions, the university students from the Niğde Ömer Halisdemir University, Faculty of Economics and Administrative Sciences were chosen as the main body of this study because of the fact that they had access to a large sample and all of them were using digital devices. Sekeran [15] also stated that 384 questionnaires would be sufficient if the population is one million or more with 95% reliability. In this study consisting of 4532 students, although 542 questionnaires were answered, only 446 were used in analyzes due to missing data. Table 1 provides information on the demographic characteristics of the participants.

Table 1. Characteristics of the respondents

Characteristics	Min.	Max.	Mean	St. Dev.
<i>Age</i>	18	28	21.05	1.49
<i>Income (TL)</i>	100	4250	758	610
<i>Age of dating game</i>	5	20	12.34	3.07
<i>Overall academic average</i>	0.78	3.97	2.51	0.55
<i>Gender</i>			Frequency	Percentage
Male			201	45.1
Female			245	54.9
<i>Weight Problem</i>				
Yes			101	22.6
No			320	71.7
Unanswered			25	5.6
<i>Number of events (cinema, sports etc. / weekly)</i>				
No			60	13.5
1 time			151	33.9
2 times			111	24.9
3 times			74	16.6
4 and over			48	10.8
Unanswered			2	0.04

Findings

Cluster Analysis

A two-step analysis procedure was applied to achieve the objectives of our study. In the first stage, clustering analysis was used to classify the research sample according to digital game play habits and behaviors. In the second stage, Chi-Square and Anova analyzes were used to compare the personal characteristics and success levels of the resulting classes. The Ward method, which minimizes internal cluster differences between variables used in clustering, but maximizes the differences between external clusters is used. Hence, hierarchical clustering analysis [16] was carried out and the tree diagram and the aggregation coefficient were examined and it was decided that the sampling would be appropriate in three clusters.

Data collected with a scale consisting of items including the behaviors and emotions before, during and after the game are statistically grouped with the help of clustering analysis. As a result of the conducted clustering analysis, the research sample is divided into three groups. *Addicts*: The first cluster, called addicts, has the highest average of all items on the playing habit scale and has significantly differentiated from the other two clusters according to the LSD test. Addicts are in the first place in all items and their

average is well above the cluster average. They have a fairly higher average than the general average, 94 people in this cluster; called addicts because of their differentiation in all the other two clusters, represent about 21% of the whole sample. *Candidates*: This cluster has 143 members. The average values of the members of this group vary between 2.17 and 3.14, and when examined as a whole, it is noteworthy that all values are above the sample average. According to the LSD test, it was called statistically different from the other two groups, as well as a large number of consciences and a high average value of the samples, as candidates with addiction potency, and therefore named as candidates. *Conscious*: It is defined as conscious as the items in the game playing habit scale are the lowest of all the items, and those with average values well below the average averages. According to LSD test results, they are statistically different from the other two groups. When all of the 17 items were examined, the average values varied between 1.07 and 1.59. There are 209 people in the consciousness group with the largest number of members and constitutes about 47% of the total sample.

Relationship between Game Play Behavior Groups and Personal Characteristics

F and χ^2 tests were used to determine whether the groups with three different game play behaviors obtained by the clustering analysis differ in terms of personal characteristics (gender, income, age, age of play, weight problem, and number of weekly activities). The results are presented in Tables 2 and 3.

When Table 2 is examined, it is understood that approximately two-thirds of the males are included in the group of addicts and candidates whereas approximately one third of the women are included in these groups. It shows that statistically there is a relation between the groups and gender. In terms of weight problems, there was no statistically significant relationship between the groups and this problem. However, when the values in Table 4 are examined, it is seen that approximately one fourth of the members in the group of addicts and candidates (29%, 28%) stated that they have a weight problem and about one fifth (19%) of those in the conscious set.

Table 2. Personal characteristics by clusters: χ^2 results

Characteristics	Total	Addicts	Candidates	Conscious
<i>Gender^a</i>		[n = 94]	[n = 143]	[n = 209]
Male	201	64	75	62
Female	245	30	68	147
<i>Weight Problem^b</i>		[n = 89]	[n = 138]	[n = 194]
Yes	101	26	38	37
No	320	63	100	157
<i>Number of events^c</i>		[n = 94]	[n = 143]	[n = 207]
No	60	18	21	21
1 time	151	36	43	72

2 times	111	26	40	45
3 times	74	8	22	44
4 and over	48	6	17	25

Notes: ^a $\chi^2=43.3, p<0.05$; ^b $\chi^2=4.85, p>0.05$; ^c $\chi^2=15.6, p<0.05$.

In the study, the numbers of times a week from respondents were asked to indicate that they participated in an event such as sports, cinema, travel etc. In the examination, it was seen that there was a relationship between the number of weekly activities and game addiction. Fifty-seven percent of the participants in the addicts group participated no event or only once a week, while this rate was 45% in the conscious group.

Table 3. Personal characteristics by clusters: Anova results

Characteristics	Overall	Addicts	Candidates	Conscious
Monthly Income ^a	[n=351]	[n=71]	[n=109]	[n=171]
Cluster mean	758	851	697	758
Cluster st. dev.	610	678	483	651
Age ^b	[n=421]	[n=88]	[n=133]	[n=200]
Cluster mean	21.1	21.2	20.9	21.1
Cluster st. dev.	1.49	1.56	1.41	1.51
Age of dating game ^c	[n=437]	[n=93] ^d	[n=142]	[n=202] ^d
Cluster mean	12.34	11.69	12.23	12.72
Cluster st. dev.	3.07	3.03	2.97	3.13

Notes: ^a $F=1.37, p>0.05$; ^b $F=1.50, p>0.05$; ^c $F=3.75, p<0.05$. ^d There is a statistically significant difference between age groups and consciousness at $p < .05$ level in terms of the age of dating in the digital environment.

When Table 3 is examined, it is revealed that there are no differences between the three clusters in terms of game-play behavior when the income and age characteristics are examined. In other words, although the participants of the study are from different age and income groups, there is no distinction between income-dependent and age-dependent ones and those who are addicted or play consciously.

There is a statistical difference between the clusters in terms of the age of getting acquainted with the game in the digital environment. It is understood that the addicts meet the game at an earlier age and the conscious at a higher age than the general average. This situation also arises statistically. The same applies to the age of the having first smartphone. Both the addicts and the candidates were below the general average, and the conscious had their first mobile phone at an age above the general average. Statistically, there is a difference between conscious and candidates/addicts.

Relationship between Game Play Behavior Groups and Performance

The success of the clusters in terms of game play behavior were compared using three different variables (the duration of the study, the overall academic average and the comparison of the achievements of the students with a difficult course) and the results are presented in Table 4.

Table 4. Academic success by clusters: Anova results

Performance	Overall [n=446]	Addicts [n=94]	Candidates [n=143]	Conscious [n=209]
Average study time ^a		[3] ^d	[3]	[1, 2]
Cluster mean	5.53	4.56	5.26	6.15
Cluster st. dev.	3.37	3.49	3.23	3.30
General Academic Average ^b		[2, 3]	[1, 3]	[1, 2]
Cluster mean	2.51	2.28	2.44	2.66
Cluster st. dev.	0.55	0.52	0.53	0.55
Overall success level when compared to classmates ^c				
Cluster mean	3.72	3.59	3.70	3.80
Cluster st. dev.	0.89	0.91	0.83	0.86

Notes: ^a $F=8.14$, $p<0.05$; ^b $F=17.71$, $p<0.05$; ^c $F=1.75$, $p>0.05$. ^d The numbers in parenthesis show different cluster numbers statistically at $p < .05$ level according to LSD test results.

Participants were asked to study the final exam for a difficult course and the answers were analyzed in terms of game addiction groups. The average working time of addicts and candidates remained below the general average, whereas the conscious group had a study time above the general average. Statistically, this difference was confirmed between the groups. In addition, it was seen that the conscious differed from the addicts and the candidates in terms of study time.

Similar comparisons were made for the general academic average and statistically significant difference was found between the groups. In the detailed analysis between the groups, it was determined that all groups were statistically different from each other and the GPA decreased as the addiction level increased. Again, it was found that there was a statistically significant correlation between the study period and the general academic average.

Participants were asked to perform a subjective success assessment and to compare the overall success levels of the subjects with their friends. Although the subjective evaluations of the members in the group of addicts were below the general average and the groups of conscious were above the general average, there was no statistical difference between the groups.



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Conclusions

In this study, digital play habits of the young people (regardless of console, computer or mobile), personal characteristics and the relationship with academic achievement were examined. Data were collected from 446 university students (different age, income and academic average) by face-to-face interviews using a structured standard questionnaire.

Firstly, clustering analysis was carried out to classify the research sample according to the digital game play habits and behaviors. In the analysis carried out by using the answers given to the items in the play scale, it was seen that the sample was divided into three groups. The first cluster addicts, the second cluster candidates and the third cluster conscious were defined based on the item averages, general average and differences from the other two clusters.

In the comparison analyzes carried out among the emerging groups, no difference was found in terms of income, age and weight problem. On the other hand, it was found that approximately two-thirds of the members of the addiction were men. It was also seen that there is a difference between the groups in terms of the age of starting the digital game and the number of times the game was played per week. In addition, it was found out that, in terms of performance variables, as the game addiction statistically increases (study group of addicts and candidates), the study hours decreased and the general academic average decreased compared to the conscious group.

Another important finding in the study was that digital gaming addicts and addicted candidates did not accept themselves as failing in terms of the study. While these findings indicate that gaming addiction decreases the duration of study and academic achievement, addicts do not want to accept or are unaware of this situation.

References

1. Dijital Oyunlar Raporu (2017). www.guvenliweb.org.tr/dosya/82MsL.pdf/indir.
2. WCP (2016). Game industry overview. <http://www.woodsidecap.com/wp-content/uploads/2016/12/WCP-Gaming-Industry-Overview-2016.pdf>.
3. Goswami, V. and Singh, D.R. (2016). Impact of mobile phone addiction on adolescent's life: A literature review. *International Journal of Home Science*, 2(1), 69–74.
4. Anderson, C.A. and Dill, K.E. (2000). Video games and aggressive thoughts, feelings and behavior in the laboratory and life. *Journal of Personality and Social Psychology*, 78(4), 772–790.
5. Wright, J. (2011). The effects of video game play on academic performance. *Modern Psychological Studies*, 17(1), 37-44.



International Child and Information Safety Congress
“Digital Games”
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FULL TEXT BOOKLET

6. Anand, V. (2007). A study of time management: The correlation between video game usage and academic performance markers. *Cyber Psychology and Behavior*, 10(4), 552-559.
7. Borzekowski, D.L. and Robinson, T.N. (2005). The remote, the mouse, and the no. 2 pencil: The household media environment and academic achievement among third grade students. *Archives of Pediatrics and Adolescent Medicine*, 159(7), 607-613.
8. Drummond, A. and Sauer, J.D. (2014). Video-games do not negatively impact adolescent academic performance in science, mathematics or reading. *PloS one*, 9(4).
9. Lemmens, J.S., Valkenburg, P.M. and Peter, J. (2009). Development and validation of a game addiction scale for adolescents. *Media Psychology*, 12(1), 77-95.
10. Irmak, A.Y. ve Erdoğan, S. (2015a). Ergen ve genç erişkinlerde dijital oyun bağımlılığı: Genel bir bakış. *Türk Psikiyatri Dergisi*, 26, 1-11.
11. Irmak, A.Y. ve Erdoğan, S. (2015b). Dijital oyun bağımlılığı ölçeği Türkçe formunun geçerliliği ve güvenilirliği. *Anadolu Psikiyatri Dergisi*, 16(1), 10-18.
12. Hussain, Z., Williams, G.A. and Griffiths. M.D. (2015). An exploratory study of the association between online gaming addiction and enjoyment motivations for playing massively multiplayer online role - playing games. *Computers in Human Behavior*, 50, 221-230.
13. Hazar, Z. and Hazar, M. (2017). Çocuklar için dijital oyun bağımlılığı ölçeği. *Journal of Human Sciences*, 14 (1), 203-216.
14. Young K. (2017). Internet Addiction Test (IAT). <http://www.psylegal.com.au/Awur/wp-content/uploads/2016/03/GLOBALADDICTION-Scales-InternetAddictionTest.pdf>
15. Sekeran, U. (1992). Research methods for business, a skill building approach. John Wiley & Sons Inc.
16. Vorhies, D.W., Harker, M. and Rao, C.P. (1999). The capabilities and performance advantages of market-driven firms. *European Journal of Marketing*, 33(11-12), 1171-1202.



Examination of Game Preferences of Junior High School Students

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Abstract

Computer games, with the rapid development of technology and the widespread use of technological devices, it has become an important activity in people's lives. The aim of this study is to determine the digital game preferences of junior high school students and to examine their habits of playing. Literature review was done about this aim. The research was conducted on a total of 58 junior high school students studying in Selçuklu, Karatay and Kadınhanı districts of Konya in the academic year of 2017 – 2018. As a data gathering tools, Orlick's "Game Classified Model" which turned into practice by Gazi Karabulut (2010) "Game Preference Form" was used. As a result of the practise, a set of data was reached, the data obtained were interpreted with in the scientific framework and the findings obtained from the statistical analyzes were used to answer the questions in the research. Findings obtained from the research showed that the results are similar to the results in literature. According to the results of the research, it was observed that the gender gap was effective and male student played more games than girls. Furthermore, it was determined that the financial situation of the students' families didn't affect the playing of computer games in this study. Another factor is whether or not someone has their own computer. Someone with a computer is more likely to play computer games.

KeyWords: Computer games, game preference, junior high school students, mix method

Introduction

In our age, there is a dizzying change and progress in the field of science and technology. Information technologies also take their share from this change and progress. These technologies are used for many different purposes and facilitate our business in almost every area of our lives (Unal, 2013). Computers are the most beautiful and advanced products of this change and progress. When the historical process is analyzed, it is seen that computer games have entered our lives in a short time with the appearance of computers (Ustunel, 2008).

The game, whose roots are as old as the history of mankind, has been played in different ways in different geographies for centuries. We can say that the games made the greatest impact on the social structure with the rapid developments in the field of technology. The introduction of commercial computer games in the world In the 1970s, the introduction of digital games to our country corresponded to the short time after we



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met the computers, which corresponded to the 1980s. (Ustunel, 2008). The game “talent and intelligence developer, specific rules, have a good time” or “made to develop physical and mental abilities, agility competition” is defined as. (TDK, 2010). As a result of the rapid change in the field of technology, computer games have become one of the entertainment environments that attracts young people and continue to attract more and more every day. Made national level research seems to support this status for Turkey in general. According to a survey conducted by the Turkey Statistical Institute, Percentage of households with internet access opportunities across Turkey in the 16-74 age range has increased to 80,7%. According to the same study, the rate of computer use on a personal basis is 56.6% internet usage rate is 66,8%. The situation in the Internet and computer use, along with popular activities, includes games where children are the target audience (TUIK, 2017). Today, computer games are a passion for children, young people and even adults (Ustunel, 2008). When the literature on computer games is examined, many variables are examined. These are generally is for game preferences, game playing purposes, changes in gaming by gender and game playing time (Cakir, Ayas ve Horzum, 2011; Durdu, Hotomaroglu ve Cagiltay, 2004; Tuzun ve Ozdinc, 2010). According to the results of a study conducted before, the duration of playing computer games increased in primary education levels, but it was found to decrease in higher education levels. In other words, as the level of education increases, the playing time has decreased. (Sherry, deSouza, Greenberg ve Lanchlan, 2003).

Malone (1981) in a study on computer games, he mentions four elements that play a role in people's game play. Imaginary environments (Fantasy), wonder, challenge and control identifies items such as. “These elements, which affect both game and game type selection, are transformed into similar situations with learned imaginary environments. Wonder; if there is a difference between the previous state and the current situation cognitive and affective emotion. Challenge; the uncertainties encountered in the path followed in achieving the objectives of the game and cognitive and affective. Control gives the player a sense of dominance” (Malone, 1981, Kula ve Erdem, 2004). In addition to computer games players is a platform where they reveal their strong emotional behavior as ambition, power, wonder, joy and fear (Can ve Cagiltay, 2006).

Digital games preferred by individuals and reasons to choose these games constitute another focus of the game (Pala ve Erdem, 2011). There are two different opinion on students' choice of game and game type. First Opinion, explains the different game preferences of children by considering social effects. The second opinion is that digital game preferences differ according to individual characteristics (Can, 2003). In a study conducted in Turkey, gender the reasons for choosing the game were observed as the decisive variable in the types of games played. (Durdu, Tufekci ve Cagiltay, 2005).

In this context; Nowadays, computer games with increasing attractiveness for many people are discussed in this study which aims to examine the reasons of junior high school students' choice of play and the types of games they play in terms of different variables.



Intention

The purpose of this research, examination of the computer game preferences of the students in junior high school in Konya province. For this purpose, the following research questions were directed to the study:

1. What are junior high school students' computer game preferences?
2. What are the reasons why secondary school students choose to game?
3. What is the distribution of secondary school students' choice of computer games in terms of gender, socio-economic level and lack of computer and is there a meaningful relationship between them?

Importance

In the present century, technology, especially computer use, are indispensable tools of life and computer games are becoming more common. This study was carried out to determine the playing habits and preferences of junior high school students. In this respect, work in general contribute to other studies carried out in Turkey by supporting common themes and findings of this study are important in terms of strengthening.

Method

Mixed research method was used as a research model for the analysis of play preferences of junior high school students and survey - interview techniques were used for data collection. In this research, which is a descriptive study, screening method is used. In order to carry out the research, the objectives of the research were determined and the inventory to be used to determine these objectives was found. For this purpose, an inventory of two parts was developed by the researchers in order to determine the preferences of the students in the study. In the first section, there are items to determine demographic information (gender, socio-economic level, etc.), in the second part Orlick's "Game Classification Model" Gazi Karabulut's (2010) who turned it into practice "Game Preference Form" was used.

After determining the aims of the study and inventories suitable for these purposes, the researcher gave information about the aim and scale of the research. The research was conducted on 58 junior high school students who were studying in Selcuklu, Karatay and Kadinhani districts of Konya province during 2017 - 2018 Academic Year Fall semester.

A total of 8 students who didn't answer the form and who didn't answer open-ended questions were excluded from the study group and the work continued with the remaining 50 people. In the study group 24 (48%) male and there are 26 (52%) female students. Volunteering was taken into consideration in the study. In addition, direct quotations were made from the participants. Students are given numbers from 1 to 50 when quoting [S: 1 (Student: 1), S:2, (Student: 2)].



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The data obtained from the Game Preference Form were analyzed by using mixed research techniques and the findings were interpreted in the context of the related literature.

Results

Most of the 50 participants stated that they played computer games. 42 participants (84%) stated that they played computer games and 8 participants (16%) stated that they didn't play computer games. 24 (48%) boys and 18 (36%) girls; all of the men playing the game, 8 (16%) women who don't play games.

Within the scope of the research, the opinions of the students about the game preferences are given according to the sub-problems. The findings obtained are as follows;

**What are the computer game preferences of junior high school students?*

In the scope of the research firstly students' computer game preferences were investigated. To this question students were allowed to answer more than once. Table: 1 shows the distribution of the games played and don't played by the students participating in the study..

Table 1. Types of Games Preferred by Students

Game Types	Playing		Not Playing	
	f	%	f	%
1 From beginning to end of the game; games where you have to win one or the other and eventually win a winner	33	66	17	34
2 Collaborating with group friends; games where there is competition and winning against another group	40	80	10	20
3 From beginning to end of the game; games I play alone, without cooperation and competition	17	34	33	66
4 I have collaborated with my group friends to achieve my target, games that help my group friends achieve their targets	28	56	22	44
5 From beginning to end of the game; I collaborated with my group friends, games where there is no one or someone to win	10	20	40	80

Considering that more than one type of game is preferred by students in Table 1; 33 students (66%) 1st type, 40 students (80%) 2nd type, 17 students (34%) 3rd type, 28 students (56%) 4. Type and 10 students (20%) 5. types of games plays.

According to Table 1;students most “*Collaborating with group friends; games where there is competition and winning against another group*” (% 80)preferred,second place“*From beginning to end of the game; games where you have to win one or the other and eventually win a winner*” (% 66), third place“*I have collaborated with my group friends to achieve my target, games that help my group friends achieve their targets*” (% 56), in fourth place “*From beginning to end of the game; games I play alone, without cooperation and competition*” (% 34) is coming. According to the table the least played game type, “*From beginning to end of the game; I collaborated with my group friends, games where there is no one or someone to win*” (% 20)is seen.

***What are the reasons why junior high school students choose to game?**

Within the scope of the second sub-problem of the research, students who were playing computer games were asked the reasons for playing the game and 19 participants (38%) stated that they played games to for win, 13 participants (26%) for fun, 8 participants (16%) to for cooperate, 5 participants (10%) stated that they played games in order to for compete and 5 participants (10%) stated that they played games for success.The findings of the reasons for playing the games are given in Table 2.

Table2. Analysis of Students' Game Play Reasons

Reasons for Playing Games	f	%
In order to win	19	38
In order to have fun;	13	26
In order to cooperate	8	16
In order to compete	5	10
In order to achieve success	5	10
Total	50	100

Some of the students' statements about the reasons of the game are as follows;

1. for game type:“*From beginning to end of the game; I'd rather play the games where you have to win one or the other and eventually win a winner.*”

S:8 “*Çünkü birisini yenip oyunu kazanmam bana özgüven, cesaret ve rekabet kazandırıyor.*”

2.for game type:“*Collaborating with group friends; I'd rather play the games where there is competition and winning against another group.*”



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S:33 "Grupla oynamak benim daha çok işime yarıyor. Hem grup arkadaşlarımla iş birliği kurmayı daha çok seviyorum ve istediğimiz ödülü de alıyoruz."

3.for game type:"From beginning to end of the game; I'd rather play the games I play alone, without cooperation and competition."

S:10 "Çünkü kendimin güçlü olduğumu kanıtliyorum."

4.for game type:"I'd rather play the games I have collaborated with my group friends to achieve my target, games that help my group friends achieve their targets."

S:45 "Çünkü bu sayede iş birliğini öğrenip gerçek hayatta uygularız."

5.for game type:"From beginning to end of the game; I'd rather play the games I collaborated with my group friends, games where there is no one or someone to win."

S:35 "Çünkü o oyunlarda istediğim şeyi zamana bağlı seçmiyorum."

*** How do junior high school students choose computer games according to gender, socio-economic level, and computer ownership?**

Of the participants, 24 (48%) were male and 26 (52%) were female. When we look at the distribution of gaming and gaming preferences to gender the most preferred game by participating men was 87.5% (21); "while defeating one and finally winning games", the games preferred by women are 76.9% (20) and "collaborating with my group friends, the games where the competition and winning". According to the independent sample t test results, it was concluded that the variances weren't homogeneous and there was a significant difference between the gender of the students and the playing situation.

Table3. Results of T-Test Analysis for Comparing Computer Games of Men and Women

Group	N	Average	Std. Deviation	t	df	p
Woman	26	1,31	0,471			
Man	24	1,00	0,000	3,333	25,000	0,003

In order to compare the levels of computer play of boys and girls, t-test was performed it was found that male and female students were different from each other. It can be said from the findings obtained from this study that gender difference is effective in game play.

Of the 42 participants who played computer games, 29 (69%) had a computer and 13 (31%) had no computer. In addition, it was determined that 2 out of 31 students (6.4%) who said that they had a computer didn't play computer games and 13 of 19 students (68%) who said that they didn't have a computer played computer games. The reason

for this is thought to be the internet cafes and games played with computers in the school.

Table 4. The Results of T-Test Analysis for Comparing the Effect of Possessing a Computer to the Level of Computer Gaming

Group	N	Average	Std. Deviation	t	df	p
Yes	31	1,06	0,250			
No	19	1,32	0,478	-2,122	24,132	0,044

According to the independent sample t test results, it is concluded that the variances aren't homogeneous and there is a significant difference between students' computer ownership and game play.

When we examine the relationship between socio-economic levels of students and their playing habits; 4 of the 8 participants who did not play a computer game (50%) had a salary of 0 - 1500 TL, 2 of them (25%) had a family salary of 2000 - 2500 TL. It was determined that it was between 2000 TL and 1 (12.5%) of the family salary was 3000 TL and above. In addition, the results of one-way analysis of variance (ANOVA) for analyzing the effect of socio-economic levels on the level of playing computer games are given in Table 5.

Table 5. One-Way Analysis of Variance (ANOVA) Results to Investigate The Effect of Socio-Economic Levels on Computer Game Play

	Number of People	Average	Std. Deviation	Std. Error	95% Confidence Interval		Minimum	Maximum
					Lower Limit	Top Limit		
0 - 1500 TL	9	1,44	,527	,176	1,04	1,85	1	2
1500 - 2000 TL	14	1,07	,267	,071	,92	1,23	1	2
2000 - 2500 TL	13	1,15	,376	,104	,93	1,38	1	2
2500 - 3000 TL	6	1,00	,000	,000	1,00	1,00	1	1
3000 TL and above	8	1,13	,354	,125	,83	1,42	1	2
Total	50	1,16	,370	,052	1,05	1,27	1	2



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The data obtained from the literature showed that there was a parallelism between the socio-economic levels of the students and the game play. However, one-way analysis of variance (ANOVA) results showed that the variance wasn't homogeneous and Tamhanes T2 test was used. It was concluded that there is no significant difference between the socio-economic levels of the students and the game playing situation.

Result

In this study, which was carried out to examine the reasons of the preference of junior high school students in terms of digital play preferences and game preferences, students' play preferences in terms of gender, computer status and socio-economic level and how the reasons of play were distributed according to these variables were examined. The result of the study was found to be consistent with general similar studies and the following conclusions were reached;

In the context of the study, firstly students' computer game preferences were examined. First, students' computer ownership status was investigated and then analyzes were made for game types and reasons of preference. Accordingly, it was found that most of the students had computers (%62). Considering the results of the study; playing computer games is thought to increase with each passing day. Other studies in the literature confirm this situation.

According to the results of the study, 84% of the students were playing computer games. The fact that the majority of the gamers is male shows that there is a significant relationship between the tendency to play and gender and the findings in the literature support this result. In addition, the types of games played vary by gender. Accordingly male students most prefer; *“from beginning to end of the game; games where you have to win one or the other and eventually win a winner”* (% 87,5) , female students most prefer; *“collaborating with group friends; games where there is competition and winning against another group”* (% 76,9).

One of the reasons to choose games for students is to win, have fun, cooperate, compete and achieve success. When the participants in the study examined the distribution of game preferences according to the reasons of the game preference; *“collaborating with group friends; games where there is competition and winning against another group”* (% 80) students who play the most co-operation and entertainment options as the reason to choose the game. *“from beginning to end of the game; games where you have to win one or the other and eventually win a winner”* (% 66) have stated that the most winning and competing options are games. *“I have collaborated with my group friends to achieve my target, games that help my group friends achieve their targets”* (% 56) stated that they preferred to cooperate and achieve success. *“From beginning to end of the game; I collaborated with my group friends, games where there is no one or someone to win”* (%34) have stated that the most entertainment option is the game preference. Finally; *“From beginning to end of the game; I collaborated with my group friends, games where*



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there is no one or someone to win” (% 20) have stated that the most cooperation and entertainment options are the reason for choosing the game. As it is understood from here, it can be said that junior high school students' choice of games is consistent with their preferences.

References

Can, G., Çağıltay, K.: “Turkish Prospective Teachers' Perceptions Regarding the Use of Computer Games with Educational Features”, Journal of Educational Technology and Society, 9 (1), (2006) 308-321

Can, G. (2003). Perceptions of prospective computer teacher toward the use of computer games with educational features in education. Unpublished master's thesis, METU, Ankara.

Durdu, P. O., Hotomaroğlu, A., & Çağıltay, K. (2004). Türkiye'deki Öğrencilerin Bilgisayar Oyunu Oynama Alışkanlıkları ve Oyun Tercihleri: Odtü ve Gazi Üniversitesi Öğrencileri Arası Bir Karşılaştırma. Bilişim Teknolojileri Işığında Eğitim Konferansı'nda Sunulan Bildiri, Ankara.

Durdu, P., Tüfekçi, A. ve Çağıltay, K. (2005). Üniversite öğrencilerinin bilgisayar oyunu oynama alışkanlıkları ve oyun tercihleri: ODTÜ ve Gazi Üniversitesi öğrencileri arasında karşılaştırmalı bir çalışma. Eurasian Journal of Educational Research, 19, 66-76.

Horzum, M. B. (2011). İlköğretim öğrencilerinin bilgisayar oyunu bağımlılık düzeylerinin çeşitli değişkenlere göre incelenmesi. Eğitim ve Bilim, 36(159).

İnal, A. G. Y., & Çağıltay, K. İlköğretim Öğrencilerinin Bilgisayar Oyunu Oynama Alışkanlıkları ve Oyun Tercihlerini Etkileyen Faktörler.

Karabulut, G. (2010). İlköğretim 5. Sınıf Öğrencilerinin Oyun Tercihlerine ve Spora Katılımlarına Göre Kaygı Düzeylerinin ve Başarı Algılarının İncelenmesi (Doctoral Dissertation, DEÜ Eğitim Bilimleri Enstitüsü).

Malone, T. W. (1981). What makes things fun to learn? A study of intrinsically motivating computer games. California: Palo Alto Research Center.

Pala, F. K., & Erdem, M. (2011). Dijital Oyun Tercihi ve Oyun Tercih Nedeni ile Cinsiyet, Sınıf Düzeyi ve Öğrenme Stili Arasındaki İlişkiler Üzerine Bir Çalışma. Journal of Kirsehir Education Faculty, 12(2).

Sherry, J.L., deSouza, R., Greenberg, B.S., ve Lanchlan, K. (2003). Video games uses and gratifications as predictors of use and game preference among different age cohorts. Paper presented at Mass Communication Division, International Communication Association Conference, San Diego, CA.



International Child and Information Safety Congress
“Digital Games”
April 11–13, 2018 – Ankara, TURKEY
FULL TEXT BOOKLET

Torun, F., Akçay, A., & Çoklar, A. N. (2015). Bilgisayar Oyunlarının Ortaokul Öğrencilerinin Akademik Davranış ve Sosyal Yaşam Üzerine Etkilerinin İncelenmesi. *Karaelmas Eğitim Bilimleri Dergisi*, 3(1).

Tutgun Ünal, A., İnan, F., Tuğrul, K. A. Y. A., Fırat, M., Güzelbaba, Z., & Bahadır, A. (2013). Öğretmen Adaylarının Bilgisayar Oyunu Oynama Alışkanlıkları, Amaçları ve Oyun Tercihlerinin İncelenmesi: Maltepe Üniversitesi Örneği. *AJIT-e: Online Academic Journal of Information Technology*, 4(12).

TÜİK, (2017). Hanehalkı Bilişim Teknolojileri Kullanım Araştırması. Haber Bülteni. URL: <http://www.tuik.gov.tr/PreHaberBultenleri.do?id=24862> Erişim: 7 Ocak 2018

Türk Dil Kurumu (2010). Büyük Türkçe Sözlük. 15.12.2017 tarihinde <http://tdkterim.gov.tr/bts/> adresinden ulaşılmıştır.

Tüzün, H., & Özdiç, F. Öğretmen Adaylarının Bilgisayar Oyunu Oynama Alışkanlıkları ve Tercihlerine Yönelik Bir Durum Çalışması A Case Study Related To Teacher Candidates' computer Game Playing Characteristics and Preferences.

Uluyol, Ç., Demiralay, R., Şahin, S., & Eryılmaz, S. (2014). Öğretmen Adaylarının Oyun Tercihleri ve Bilgisayar Oyunu Oynama Alışkanlıklarının İncelenmesi: Gazi Üniversitesi Örneği. *Journal of Instructional Technologies & Teacher Education*, 3(2).

Üstünel, H. (2008). Üstün Zekâlı Öğrencilerin Pc Oyun Tercihlerinin Akademik Başarılarına Etkileri. Marmara Üniversitesi Fen Bilimler Enstitüsü, İstanbul.



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Impact of Screen Exposure on Children’s Psychological Well-being: The Role of Self and Emotion Regulation

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Özet

Bu derlemede, ekrana maruz kalma süreleri artan çocukların ruhsal gelişimlerinin nasıl etkilenebileceği ile ilgili bilgi aktarılmaya çalışılmıştır. Bu doğrultuda, yetişkinlerin ve ergenlerin internet kullanımı ile ilgili faktörlere değinilmiştir. Ayrıca, bilgisayar ve internet kullanımının yetişkin ve ergenlerin ruh halini nasıl etkilediği aktarılmıştır. Ardından, gelişim çağında olan çocukların ekrana maruz kalma süresi artıkça ruhsal yönden nasıl etkileneceği ile ilgili 2 kurama kısaca değinilmiştir. Bunlar Bandura’nın Sosyal Öğrenme Kuramı, Sosyalleşme Kuramıdır. Ekrana maruz kalmanın, çocukların iyilik halini etkilemesindeki bu yazıda ele alınan hipotetik olarak önemli faktörler, ekrana maruz kalmanın çocukların öz düzenleme ve duygu düzenleme becerilerindeki olumsuz etkileridir. Bunun da çocukların iyilik halini olumsuz etkilediği düşünülmektedir.

Anahtar Sözcükler: Ekrana Maruz Kalma, İyilik Hali, Öz Düzenleme, Duygu Düzenleme

Summary

In this review, it is aimed to give information about how increased screen exposure effects children’s psychological development. Factors related to internet use among adults and adolescents are focused. In addition, it is stated how computer and internet use of adults and adolescents effect their psychological well-being. After that, three important theory that explain relation between screen exposure and psychological well-being are stated. These are Bandura’s Social Learning Theory, Socialization Theory and Caplan’s Social Interaction Theory. There are two important and hypothetical factors related to effects of screen exposure on children’s psychological well-being. They are self and emotion regulation. Increased screen exposure hypothetically has negative affects psychological well-being of children via self and emotion regulation.

Key Words: Screen Exposure, Psychological Well-being, Self Regulation, Emotion Regulation

Recently, mass media communication tools (Television, smart phone, labtop, tablet, computer) became available for almost every house and children are exposed to these



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tools from their early ages. These electronic tools are attractive for children since they provide different noises and images constantly which also turn them into an essential asset for parents to pacify the children. However, scientifically it is unknown how the exposure period affects children and their various development areas. This review tries to emphasise how children’s psychological development can be affected by the screen exposure period. To this end relevant theories are going to be explained and studies regarding the self and emotion regulation which are also connected with the children’s psychological development are going to be focused.

According to the American Academy of Pediatrics (1), while children below 2 years old should not be exposed to screen at all, for older children, exposure period should be limited with 1 or 2 hours per day to the extent of the quality of the game played/application used or video displayed. AAP (2) also provides stunning results in terms of the exposure periods. While screen exposure period for the children below 2 years old is more than 2 hours it becomes more than 5 hours for the children older than 2 years. In addition, % 36 of the children below 6 years old has a television in their room (2). Even if there is not any concrete study on the screen exposure periods in Turkey, according to the research of the Radio and Television High Council (3) %65 of the children spends their spare time on Television and during weekend %30 of them watches television more than 5 hours per day. Moreover, Turkish Statistical Institute’s (4) research on the use of information technologies on households states that %69, 5 of the household have internet access and information technology using rate has increased %55,9 during the first half of the 2015. In line with the mentioned data it can be argued that, widespread use of media communication tools may have dramatically increased the screen exposure period of children even more today. Apart from the television it can also be claimed that portable smart phones and tablets are also causing an increase on the screen exposure periods of the children.

It influences psychological well-being of people. Although it is mainly applicable for adults it may be argued that same logic also applicable for children. Studies also indicate that children of the parents with high parental stress are keen to be exposed much longer to the mentioned tools. Likewise, it is also detected that children who are exposed to these tools are facing lack of social activities and similarly encountering problems in their family and friend relations. In this respect, it is assumed that these children’s self-regulation and emotion regulation ability, which is also related with the common psychological disorders, will be effected negatively.

Ogel (5) stated that some features of the internet or computerised interaction are more appealing than the face to face interaction. People prefers to be exist in the cyber world since communication via internet has its own benefits such as being anonymous, not requiring an eye contact, lack of social acceptance fear, to be able to pretend like anyone and it is much easier to express themselves in writing than verbal interaction. It is even more attractive for the people with socialisation problems because this people are generally insecure and has a limited social life. These people try to find a way of communication with the other people on internet or online gaming since they are not



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able to do it in their real life (6). In this respect, factors like self respect, loneliness, social fear, shyness, and life fulfilment are highly connected variables with the internet addiction. Considering the fact that children are still in their development period and their emotional intelligence and self respect will be developing by social and family interaction; intense exposure to internet or screen may make them more vulnerable for mental disorders in their future lives. This threatens both children’s and society’s future.

The Social Learning Theory (7) says that children can learn by observing other people behaviour, modelling and imitating. In this review, it is aimed to give information about how increased screen exposure effects children’s psychological development. A decade ago, research was related to television and its program effects. However, this decade, all kind of media devices that heavily used are started to search due to unknown impact. All kind of different devices makes children more stable and prevent to meet different kind of healthy stimulation. Increased screen exposure deteriorates child’s physical well being such as obesity, cholesterol and circulatory problems in addition to negative impact to language and cognitive development. Some research concludes that increasing exposure time to TV, game, video, smart phone and tablet creates attention, emotion and behavioural problems (8,9). However, these studies are so limited in the literature. Besides Social Learning Theory, Socialization Theory can explain why exposing to screen negatively affect children’s well-being.

Socialization refers to the lifelong process of observing and learning norms, customs, and ideologies, providing an individual with the skills and habits necessary for participating within his or her own society (10). Children learn socialization by interaction with environment. Television, smart phones and computer prevent enough interaction of children with their environment.

In Middle childhood, children learn important developmental skills as self regulation, emotion regulation, problem solving and coping skills (11). When children expose to screen longer than optimal amount, they keep away activities that help their development. They keep away interaction with their parent, they do not need to express themselves and so their language abilities diminish by the time (12). These devices provide instant access to videos and games. They also provide lasting joy to children and so easily replace other enriching activities. Although children may learn so many things by the help of these devices, they prevent face to face interaction and deteriorate children socialization process (13).

There are two important and hypothetical factors related to effects of screen exposure on children’s psychological well-being. They are self and emotion regulation. Increased screen exposure hypothetically has negative effects psychological well-being of children via self and emotion regulation. These two factors are learned in the socialization process and focused in the upcoming pages.

Self Regulation Skills



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Self regulation abilities consists of social or daily decision making, planning and implementing, time regulation, problem solving and ceasing the activity when it is necessary. It was observed that failing in this self regulation abilities are strongly connected with negative behaviours such as aggressiveness, drug abuse, temptation and obesity. Baumeister et al. (14) has stated that self regulation abilities are limited resource. After a difficult task self regulation abilities are depleted and performance in the next task is reduced. In support of this claim, Harma et. al. (15) states that self regulation abilities deplete after playing a video game and they became not interested with the following activities. On the other hand it is also argued that improving the self regulation abilities is very similar to muscle building process since they both require repeating in order to get better. Therefore when the screen exposure period of the children increases; the time needed in order to improve their self regulation ability and social activities decreases. Since they use and deplete their self regulation abilities following the performance showed on the screen for a long time, they struggle in the following daily task or simple daily life activities (15)

A research which is conducted on 1198 university students in Turkey on the internet addiction concluded that people with the low self regulation abilities use the internet for much longer periods (16). At the same time ADHD is a risk factor for internet addiction. Surfing on internet does not require a special effort and it becomes easier for them to entertain themselves in the internet's colourful world. And this feature strengthens the attitudes of the people with ADHD (12,13). Emotion regulation, a sub-dimension of self-regulation, is also one of the factors that predict child mental health (17).

Emotion Regulation Skills

Thompson (18) claimed that “emotion regulation consists of the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one’s goals”. Middle childhood is important developmentally to improve emotion regulation skills because in this period, self-understanding begins to emerge (19). The ability of children to regulate an emotion depends on their previous interactions with the social environment as well as the developmental status of them. Emotion regulation provides children with insight into their own emotive processes. Therefore, children can act more competently and confidently in difficult occurring situations. In general, emotionally expressive environments accepting of children’s emotions promote the development of emotional knowledge. In other words, at first parents have an important role to improve their children's emotion regulation capacity. I can say that emotion dysregulation in childhood mostly emerges in the context of dysfunctional family environment.

Emotion dysregulation has been found correlated both externalising and internalising disorder in infancy, in childhood and in adolescence (17). Similar to self regulation skills, as screen exposure time increases, I can say that children keep away from social interaction and situations that they need to develop these skills.



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La Rose, Lin ve Eastin (20) found that people who can not control their internet use have limited self and emotion regulation capacity. Adults with insufficient self regulation abilities use the internet much more and in a compulsive way. When it is interpreted from the children aspect self regulation ability is similar with muscle grow in terms of needing repeatiton to develop itself. While self regulation ability is less developed during the preschool period it is expected that it will continue to be developed in line with the brain development. In addition this ability is directly related with the work life and academical career. Primary school period is the fastest growing period for this ability. During this period children has to listen to lecture given in the class, dealing with homeworks and overcome from various tasks. Instead of dealing with such activities spending time on smart phones and PC or TV may negatively affect the brain development of the children. Children not dealing with these kinds of daily and relatively easy tasks will have difficult time facing with the harder task in the future.

Due to face to face communication requires sensitiveness for the emotional signs it may cause increasing internet use for some people (6). It may also be used as coping mechanism for the people without stress management and problem solving abilities. According to a study conducted on adolescences it is found that there is a connection between avoidant coping and addictive internet use. In this respect people may become internet or screen addict in order to avoid the problems encountered in life (6).

Children Screen Exposure Time

The most related to factors about screen exposure time are conflict and interaction level in family, parent screen exposure time and not having rule related to screen exposure time in the family(21-24). Children having emotional and behavioural difficulties viewed more hours of aggressive television programmes and played computer game with violence content than controls. In addition, these children were exposed to longer amount of time than control groups (25). In addition, there is no control on these children what they do when they are exposed to longer amount of screen time. High level of family conflict and inconsistent rule related to screen exposure time make dramatic increase in screen exposure (24).Results of the hierarchical regression analysis revealed that time spent on the internet, fathers’ education and parental computer monitoring are important factors to predicted problematic internet use among adolescents. Therefore, parental monitoring is important to prevent problematic internet use among adolescents (26).Mendelson et al. (27) conducted intervention study to limit children screen exposurertime by increasing parent and child interaction. They found that when their interaction increases, children screen exposure time decreased (27). It is observed as parental devise use increases, child use also increase. When parents used a mobile device during parent-child interaction task, they showed fewer verbal and nonverbal interactions with their children regarding eating (13). In the eating task, parent and child dyads were observed and there was no distraction form outside. Four different meals were served to them and one of them is unknown meal (halva) for those children. Mother using mobile at the table had no eye contact with herchild and gave no explanation about unknown meal. However, mother who were not



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use mobile device during meal time explained unknown meal and had more interaction with her child (13).

Exposing TV screen is found related with poor self image and aggressiveness (3). In addition, Irkin (11) conclude that low self esteem and low academic success in children are related with TV screen exposure. All these findings suggest poor well being in children due to screen exposure (12). When children are expose to all kind of screen, they become distance from social environment and oppurtinuty to develop these personal and social skills. Young people with heavy media use were less happy than moderate users and more likely to have socioemotional difficulties. Chatting on social networking Web sites and game console use were associated with higher odds of socioemotional problems. Higher total SBM use was associated with lower odds of happiness and higher odds of socioemotional difficulties. However, greater participation in sports was associated with higher odds of happiness and lower odds of socioemotional difficulties (12).

Longitudunal study conducted in UK, watching TV for 3 hour or more at 5 years predicted conduct problems by 7 years, compared with watching for under an hour (28). Ögel (5) claimed that family conflict can increase internet addiction in adolescence. Adolescence are expose to many rules about what they should do and do not from their parent. When these adolescence’s emotion and anger are not shared by their family, their internet use increase asa coping of these negative emotion. Especially, in Turkey, adolescence have to pass national exam to continue their education. When these adolescence can not cope with exam pressure and family conflict, they surf in the web rather than actively cope with these problems.

In this review, it is aimed to give information about how increased screen exposure effects children’s psychological development. Factors related to internet use among adults and adolescents are focused. In addition, it is stated how computer and internet use of adults and adolescents effect their psychological well-being. There are two important and hypothetical factors related to effects of screen exposure on children’s psychological well-being. They are self and emotion regulation. Increased screen exposure hypothetically has negative affects psychological well-being of children via self and emtion regulation. Self regulation like muscle become stronger by delibarete and conscious effort. As children screen exposure time increase, children do not expose to social situation that they need to develop their self regulation skills and so these abilities does not become strength. Similar to self regulation, as children screen exposure time increase, children do not expose to social situation that they need to develop emotion regulation skills and so these abilities does not become strength. Therefore, their self and emotion regulation skills would be limited and that is negatively impact their well-being.



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References

1. American Academy of Pediatrics (2001). Committee on Public Education. Children, adolescents, and television. *Pediatrics*, 107, 423–6.
2. American Academy of Pediatrics (2009). Council on Communications and Media. Policystatement: mediaviolence. *Pediatrics*, 124, 1495–1503.
3. Radyo Televizyon ve Üst Kurulu (2006). İlköğretim çağındaki çocukların televizyon izleme alışkanlıkları. Özel Çalışma Grubu Sonuç Raporu. Ankara, Türkiye
4. TÜİK (2015) Hane halkı biliş im teknolojileri kullanım arař tırması. 30.12.2017 <http://www.tuik.gov.tr/PreHaberBultenleri.do?id=18660>
5. Ögel, K. (2012) İnternet bağımlılığı: İnternetin psikolojisini anlamak ve internetle başa çıkmak. Ankara: Türkiye İş Bankası Yayınları.
6. Siyez D. & Uz Baş. (2013). İnternet bağımlılığı ve Psikososyal faktörler. (Eds.) Kalkan, M. & Kaygusuz, C. İnternet Bağımlılığı: Sorunlar ve çözümler. Ankara: Anı Yayıncılık.
7. Bandura, A. (1963). The role of imitation in personality, *The Journal of Nursery Education*, 18(3).
8. Jolin, E. & Weller, R. (2011). Television viewing and its impact on childhood behaviors. *Current Psychiatry Reports*, 13, 122–128.
9. Sugawara, M., Matsumoto, S., Murohashi, H., Sakai, A., & Isshiki, N. (2015). Trajectories of early television contact in Japan: Relationship with preschoolers' externalizing problem. *Journal of Children and Media*, 9, 453-471.
10. Elkin, F. (1995). Çocuk ve Toplum, Çocuğun Toplumsallaşması, Gündoğan Yayınları: Ankara.
11. İrkin, A. (2012). Çocukların gelişim süreci ve televizyonun etkileri. Yayınlanmamış Uzmanlık Tezi. Radyo ve Televizyon Üst Kurulu, Ankara, Türkiye.
12. Booker C. L., Skew A.J., Kelly Y.J. & Sacker A. (2015). Media use, sports participation, and well-being in adolescence: Cross-sectional findings from the UK household longitudinal study. *American Journal of Public Health*, 105, 173-179.
13. Radesky, J.S., Kistin, C.J., Zuckerman, B., et al. (2014). Patterns of mobile device use by Caregivers and children during meals in fast food restaurants. *Pediatrics*, 133, 843-849.
14. Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, 74, 1252-1265.



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15. Harma, M., Aktan, T., & Cagiltay, K. (2015). Aim, shoot, deplete: The impact of violent video game on self-regulatory resources. *International Journal of Human-Computer Interaction*, 31, 451–456.
16. Durak-Batıgün & Kılıç H. (2011). Internet bağımlılığı ile kişilik özellikleri, sosyal destek, psikolojik belirtiler ve bazı sosyo-demografik değişkenler arasındaki ilişkiler. *Türk Psikoloji Dergisi*, 26, 1-10.
17. Eisenberg, N., Spinrad, T. L., & Eggum, N. D. (2010). Emotion-related self-regulation and its relation to children's maladjustment. *Annual Review of Clinical Psychology*, 6, 495-525.
18. Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. In N. A. Fox (Ed.), *The development of emotion regulation: Biological and behavioral considerations (Monographs of the Society for Research in Child Development)* (Vol. 59, pp. 25-52).
19. Kopp, C. B. (1982). Antecedents of self-regulation: A developmental perspective. *Developmental Psychology*, 18, 199-214.
20. La Rose, R. Lin, C. & Eastin, M. (2003). Unregulated internet usage: Addiction habit or deficient self regulation? *Media Psychology*, 5, 225-253.
21. Goh, S. N., Teh, L. Tay, W., Anantharaman, S., Dam, R., Tan, C. S. , Chua, H. Wong, P. & Müller-Riemenschneider, F. (2015). Sociodemographic, home environment and parental influences on total and device-specific screen viewing in children aged 2 years and below: an observational study. *BMJ Open*, 6, 1-13.
22. Jago, R., Edwards, M., Urbanski, C. & Sebire, S. (2013). General and specific approaches to media parenting: A Systematic review of current measures, associations with screen-viewing, and measurement implications. *Childhood Obesity*, 9, 51-63.
23. Lauricella, A., Wartella, E. & Rideout, V., (2015). Young children's screen time: The complex role of parent and child factors. *Journal of Applied Developmental Psychology*, 36, 11–17.
24. Lee, S., Bartolic, S. & Vandewater, E.. (2009). Predicting children's media use in the USA: Differences in cross-sectional and longitudinal analysis. *British Journal of Developmental Psychology*, 27, 123–143.
25. Mitrofan, O., Paul, M. & Spencer, N. (2008). Is aggression in children with behavioural and emotional difficulties associated with television viewing and video game playing? A systematic review. *Child: Care, Health, Development*. 35, 5-15.



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26. Demir, İ., Yıldız, C., Özzorlu, E., Köse, T. & Yelkenci, Y. (2017). Ergenlerin problemleri internet kullanımında anne ve babanın izlemesinin rolü. *Yaşam Becerileri Psikoloji Dergisi*, 1, 103-114.
27. Mendelsohn, A., Dreyer, B., Brockmeyer, C., Berkule-Silberman, S., Huberman, H. & Tomopoulos, S. (2011). Randomized controlled trial of primary care pediatric parenting programs. *Archives of Pediatrics and Adolescent Medicine*, 165, 42-48.
28. Parkes, A., Sweeting, H., Wight, D. & Henderson, M. (2013). Do television and electronic games predict children's psychosocial adjustment? Longitudinal research using the UK Millennium Cohort Study. *Archives of Disease of Childhood*, 98, 341-348.



Views of Secondary School Students about Digital Play Game

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Abstract

The game is significant for the child and has a great place. Games can contribute to the development of the child positively, if they choose the games that constitute negative examples, they can be adversely affected emotionally or psychologically. Especially nowadays, with the development and progress of technology in every field the game sector is changing and developing. Traditional children's games are replaced by digital games defined as computer games, video games and electronic games. In the age of information computer and the internet, which have a great place in the formation of the information society, have greatly affected our lives in recent years. In addition, it can be said that smart phones, which we can call the combination of computer and internet, affect and change our life considerably. The interaction and communication dimensions of these devices and the digital games that come with them show that the people meet their real communication need through virtual communication and interaction. Individuals have begun to become a part of this virtual world, regardless of age or gender. In digital games, many actions that cannot be done in the real world (such as war games, violence) and earning money can be done easily. The increase in the use of social networks and smartphones has also increased the use and popularity of digital games. Children's play preferences play an important role in children's development. There are many studies on the positive and negative effects of digital games on the development of children. However, it seems that the research on examining student opinions on why children prefer digital games and what they feel when playing digital games is limited. In this context, it is important to determine the opinions of secondary school students about digital game, reasons for choosing digital games, and what they feel while playing digital games. In this study, it was tried to determine the views of the secondary school students about digital game. The study was applied to 20 secondary school students consisting of 12 male and 8 female students studying in Konya Ereğli in the academic year of 2017-2018. Qualitative research method was used in the study. "Personal Information Form" and "Semi-structured Interview Form" were used as data collection tools. Descriptive analysis and content analysis methods in the analysis of the data were used. Categorizes and subcategories belonging to these categories were obtained by coding the answers given by the participants to the interview questions. According to the analysis result, five categories as Know Digital Game, Digital Game, Digital Game Preference, Digital Game Types and Effects of Digital Game were obtained and subcategories belonging to these categories were obtained. As a result of the research, it was found that most of the students who participated in the research (90%)



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stated that the majority of the students who knew the concept of digital game, stated that they started to play digital games at the age of 9-10 and played adventure action games the most, as the frequency of playing games; very frequent and continuous for 6 persons, 2-3 hours a day for 6 persons and 1-2 days a week for 8 persons. According to the students who participated in the research, it is seen that the biggest reason for preferring digital games is that they are entertaining, interesting and winning money and prizes. It was seen that more than half of the pupils felt that they were happy and entertained while playing digital games, and that some pupils felt excited, nervous and tense. A large majority of students stated that the positive aspects of digital games are to have fun. Another positive point is that they are developing English. The negative aspects of digital games are making addictions, eye injuries, exposure to radiation and prevent from studying.

Keywords: Digital game, Secondary school students, Students' views

Introduction

Technology makes our life easier and it also causes a lot of changes. Nowadays, technology is developing and changing in every field. So much so that the traditional games played by the children are now replaced by digital games defined by computer games, video games and electronic games. The most commonly used definitions are computer games in Turkey (1). Players can play against each other in single player or multiplayer mode against artificial intelligence (2).

In digital games, many actions that cannot be made in the real world can be done easily. In addition, the increase in the use of smartphones has increased the use of digital games. Choice of games affects the development of children positively or negatively. In this context, students' opinions and the games they play were considered important and the views of secondary school students about digital game were tried to be determined.

Method

The research was applied to 20 secondary school students who were studying in Ereğli, Konya in the academic year of 2017-2018. The qualitative research method was used in the study. "Semi-Structured Interview Form" developed by the researchers was used as a data collection tool. Content analysis method was used to analyse the data.

Findings

The demographic data of the students participating in the study is given in Table 1 below.

Table 1. Demographic Data of Students

		f	%
Gender	Female	8	40
	Male	12	60
	Total	20	100
Grade Levels	5 th grade	5	25
	6 th grade	5	25
	7 th grade	5	25
	8 th grade	5	25
	Total	20	100

As seen in Table 1, 8 of the 60 students participating in the study were female (% 40) and 12 were male (% 60).

Students' answers to the interview questions are coded five categories as Know Digital Game, Digital Game, Digital Game Preference, Digital Game Types and Effects of Digital Game were obtained and subcategories belonging to these categories were obtained.

Table 2. Students' Views about Digital Game

Category	Main Theme	Sub Theme	Frequency
Know Digital Game	Yes		18
		No	2
		Total	20
Digital Game	Starting Age	5-6 age	6
		7-8 age	3
		9-10 age	11
	Frequency of Usage	1-2 days per week	8
		2-3 hours per day	6
		Very frequent, continuous	6
	Total		40
Digital Game Preference	Game	Funny	15
		Interesting	4
		Money and Reward	1
		Total	20
Digital Game Types	Game	First Person Shooter (FPS)	17
		Adventure Games	15
		Action Games	13
		Strategy Games	12



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	Network Games	11	
	Simulation Games	11	
	Sports Games	7	
	Motor Sports and Racing Games	6	
	Role Playing / Animation Games	3	
	Total	95	
Effects of Digital Game	Positive	Having fun	9
		Feeling excited and happy	8
		English vocabulary learning	2
		Thinking power	1
	Negative	Eye fatigue	7
		Addiction	5
		Anger and ambition	5
		Radiation	1
		Blocking to studying	1
		Reduce sociability	1
	Total	40	

The main themes obtained from the codes determined for the Know Digital Game category; has been designated as Yes (f=18), No (f=2). It is seen that most of the students participating in the research know the concept of the digital game.

Sub-themes obtained from the codes determined for the main theme of the Starting Age in the Digital Game category; has been designated as 5-6 age (f=6), 7-8 age (f=3) and 9-10 age (f=11). It is observed that the majority of students started playing digital games at the age of 9-10 years. Sub-themes obtained from the codes determined for the main theme Frequency of Usage category; has been designated as 1-2 days per week (f=8), 2-3 hours per day (f=6) and Very frequent, continuous (f=6). It is seen that the majority of students (f=12) play digital games every day and others (f=8) play 1-2 days a week.

The main themes obtained from the codes determined for the Digital Game Preference category; has been designated as Funny (f=15), Interesting (f=4) and Money and Reward (f=1). It is seen that the majority of students prefer digital games for they find it interesting and entertaining, one person prefers digital game for earn money and prizes.

The main themes obtained from the codes determined for the Digital Game Types category; has been designated as First Person Shooter (FPS) (f=17), Adventure Games (f=15), Action Games (f=13), Strategy Games (f=12), Network Games (f=11), Simulation Games (f=11), Sports Games (f=7), Motor Sports and Racing Games (f=6) and Role



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Playing / Animation Games (f=3). The most preferred games are FPS and adventure games. These are followed by action, strategy, network and simulation games respectively. Least role play/animation games are preferred.

Sub-themes obtained from the codes determined for the Positive main theme in the Effects of Digital Game category; has been designated as Having fun (f=9), Feeling excited and happy (f=8), English vocabulary learning (f=2) and Thinking power (f=1). The sub-themes obtained from the codes determined for the Negative main theme are; has been designated as Eye fatigue (f=7), Addiction (f=5), Anger and ambition (f=5), Radiation (f=1), Blocking to studying (f=1) and Reduce sociability (f=1). It is seen that the majority of the students stated that the positive aspects of digital games were having fun and felt excited and happy, negative aspects of digital games were fatigued of the eyes, addictive and caused the nerve and ambition.

Conclusion and Discussion

As a result of the research, the majority of the students (90%) who participated in the study knew the concept of digital game, more than half of them started playing digital games at the age of 9-10, they played the most adventure - action games, the frequency of play was very frequent-continuous, 6 people per day 2-3 hours and 8 people played 1-2 days a week. According to the students participating in the study, the biggest reason for choosing digital games is the fact that they are entertaining, interesting and give money and prizes in the game. More than half of the students who participated in the study stated that they felt happy and entertained while playing digital games, while some people felt excited, nervous and nervous. The majority of students stated that the positive aspects of digital games were to have fun. They also stated that developing English is one of the positive aspects of digital games. In the literature, it is stated that games have many positive effects on children. Games children's cognitive, affective and social development plays a great role. Games allow the child to explore his environment and develop his knowledge. Kids can learn many concepts through play. The games offer the free environments that children have a fun time (3; 4; 5; 6). Game-based learning environments help individual learning and increase students' self-confidence by reducing the level of anxiety and anxiety (7).

The negative aspects of digital games are the addiction, eye exhaustion, exposure to radiation, prevention of lectures, socialization, irritation and ambition. For a long time, playing with a computer at the beginning of the movement and tension in the neck causes pain and eclipse. Also looking at a fixed point for a long time causes fatigue, burning and itching. Posture disorders cause back and back pain (8).

Suggestions



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Students should be able to design their own games and contribute to the development of the country as well as their own development in order to ensure that the students are not just addicted to playing, but also become a generation that produces them. Awareness-raising training on digital games and applications should be provided. The idea that digital games and applications can be used not only for gaming purposes but also for information acquisition and education should be adopted.

References

- Binark, M., & Bayraktutan Sütçü, G. (2008). *Kültür endüstrisi ürünü olarak dijital oyun*. İstanbul: Kalkedon.
- Bozkurt, A. (2014). Homo ludens: Dijital oyunlar ve eğitim. *Eğitim Teknolojileri Araştırmaları Dergisi*, 5(1), 1-21.
- Aksoy, A.B., & Dere Çiftçi, H. (2014). *Erken çocukluk döneminde oyun*. Ankara: Pagem.
- Gökçearslan, Ş., & Durakoğlu, A. (2014). An analysis of video game addiction levels among secondary school students according to several variables. *Dicle University Journal of Ziya Gökalp Faculty of Education*, 23, 419-435.
- Kaya, B.A. (2013). *Development of Online Game Addiction Scale: A Scale Validity and Reliability Study*. Master thesis. Gaziosmanpaşa University, Tokat.
- Öztürk, D. (2007). *Bilgisayar Oyunlarının Çocukların Bilişsel ve Duyuşsal Gelişimleri Üzerindeki Etkisinin İncelenmesi*. Master thesis. Dokuz Eylül University, İzmir.
- İşçibaşı, Y. (2011). Our children amidst computer, internet and video games. *Journal of Selcuk Communication*, 7(1), 122-130.
- Akçayır, G. (2013). Dijital oyunların sağlığa etkisi. M.A. Ocak (Ed.), In *Eğitsel Dijital Oyunlar: Kuram, Tasarım ve Uygulama* (pp. 263-272). Ankara: Pegem Academy Publishing.



The Relation and Effect of Smart Phone to Digital Game Addiction: A Research in University Students

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Abstract

Mobile phones are one of the most important and modern communication devices of today. Mobile phones lift physical distances from the center, filling an important gap in both verbal and written communication. Along with evolving technology, the developments and variations in mobile applications have transformed mobile phones into smartphones and made them one of the most indispensable devices of our time. Smartphone technology is emerging as the mobile communication method that shows the greatest development in communication technologies.

The ability of the new generation mobile phones to connect to the internet makes it possible to carry out numerous transactions on a single platform, such as mobile data sharing, up-to-date development, taking photos, taking notes, banking transactions and executing transactions with government agencies. Thanks to the mobile applications, entertainment possibilities such as playing games are very wide, that is the reason why they have become a platform that is an alternative to computers.

Portability of smartphones, which is one of the most important gaming platforms, with its ability to connect to the internet at any moment and at anytime and to be a medium with extensive gaming applications, it offers the opportunity to play digital games anywhere and anytime for every age groups. In this study, the second part of a comprehensive research on digital gaming addiction (sequel to the relationship between digital gaming addiction and personal characteristics and success), the relationship between gaming addiction and smartphone usage and the effects of phone use were examined.

In order to determine the telephone usage habits in the study, a scale with four dimensions (called internet, withdrawal, communication, and freedom) was used which was found to be valid and reliable as a result of exploratory factor analysis conducted using data collected from 446 university students and explaining about three quarters of the variance. In order to determine the digital game addictions of participants in the survey when mobile phone usage habits of groups called addictions (game addictions), candidates (tendency to addiction) and consciousness (conscious players), obtained from the clustering analysis were examined, it was seen that addicts had the highest use in all dimensions. However, there is a statistically significant difference between the groups for internet and deprivation dimensions, but this is not the case for communication and freedom dimensions. In other words, for digital game addicts and



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addicted candidates, no connectivity to the internet and taking no advantage of the functions of the phone (except to not communicate with them) is an important problem.

Other results obtained in the analyzes carried out within the scope of the study revealed that internet and freedom dimensions of the mobile phone usage dimensions have a negative effect on the study time together with the deprivation dimension. Effect of communication dimension has not been found.

Key words: Smart phone, Digital gaming, Addiction, Academic achievement

Introduction

It is estimated that some 4.5 billion people use mobile phones worldwide [1]. According to the results of the Deloitte Global Mobile User Survey, smartphone penetration increased to 92% in Turkey, and it was 86% in 2015. In daily device usage rankings, smartphones are the most widely used devices comparing with laptops and desktops. The smartphone is at the forefront in all activations for the question of what activities you would like to do with your smartphone when connected to a mobile network. With a 49% share of playing the game was among the activities to be done with smart phones after social media access 72%, bank account control 66%, search engine usage 60% and news reading 51%. Another important point is that 18-34 age group preferred smart phones compared to the 35-50 age group. An important issue that arises in the research is the answer to the question of how many times you look at your phone on average. According to people in Turkey, referring to the average of 78, showed a performance far above the European average which is 48 times a day. When it is asked about the activities performed by smart phones 'at least once a day', the following results have been reached regarding the rates of use; video sharing 69%, video viewing 57%, news reading 55% and game play 42% [2].

With the portability of smart phones, connection to the Internet at any time and with a wide range of gaming applications, it offers the opportunity to play digital games from any age group to people at any time and place. Such widespread use brings with some problems and can lead to addiction which can be described as 'unobstructed behavior despite its negative consequences' [1]. Researches have been concluded that students spend their time in social networks, watching videos or playing games [3] during the course of the study, and intensive phone use has negatively affected academic achievement [4].

In this study, the validity and reliability of the telephone use (addiction) scale, the starting age of telephone use on game addiction and the effect of telephone addiction on academic achievement will be investigated.

Research Methodology

Sampling and Data Collection Tool

Data were collected from university students using a standard questionnaire. In the first part of the questionnaire form, the participants were asked questions (such as age, income) as well as personal (weight problem, academic average) data in order to see the effects of digital addiction on performance. In the other part of the questionnaire, the scale which is prepared to measure telephone and game addiction was included.

To determine the telephone addiction, a 19-item scale was prepared using the previous studies [5, 6, 7, 8]. In order to measure game addiction a 22-item scale was designed using the studies [9, 10, 11, 12, 13, 14] or developed by the scales used in addiction studies, taking into account the attitudes of the respondent before, during and after the play, and the attitudes and behaviors of those around him / her. The items in both measurement of addiction were benefited from the five-point Likert rating (1 = never; 2 = rarely (very rare); 3 = sometimes; 4 = most of the time; 5 = all the time).

Since a comprehensive study was carried out on digital addictions, the university students from the Niğde Ömer Halisdemir University Faculty of Economics and Administrative Sciences were chosen as the main body of this study because of the fact that they had access to a large sample and all of them were using digital devices. Sekeran [15] also stated that 384 questionnaires would be sufficient if the population is one million or more with 95% reliability. In this study consisting of 4532 students, although 542 questionnaires were answered, only 446 were used in the analyzes due to missing data. Table 1 provides information on the demographic characteristics of the participants.

Table 1. Sample

Characteristics	Min.	Max.	Mean	Std. Dev.
<i>Age</i>	18	28	21.05	1.49
<i>Income (TL)</i>	100	4250	758	610
<i>Age of having the first mobile phone</i>	5	20	14.75	2.35
<i>Overall academic average</i>	0.78	3.97	2.51	0.55
<i>Gender</i>			Frequency	%
Male			201	45.1
Female			245	54.9
<i>Permanent internet connection on the mobile phone</i>				
Yes			377	84.5
No			69	15.5
<i>Mobile phone renewal (year)</i>				
1			42	9.4
2			91	20.4

3	123	27.6
4	67	15.0
5 and over	117	26.2
Unanswered	6	1.3
<i>Forgetfulness (Mobile Phone)</i>		
No	149	33.4
1 time	56	12.6
2 times	71	15.9
3 times	42	9.4
4 and over	125	28.2
Unanswered	3	0.7

Findings

Exploratory Factor Analysis

In the analysis of data, firstly, exploratory factor analysis (EFA) was used. Before starting EFA, the KMO values of the scales showing the suitability of sample size for factor analysis were calculated and found to be 0.918. KMO values greater than 0.50 showed that the sample was sufficient for factor analysis [16]. Bartlett Barts Sphericity Test which determines the suitability of the data for factor analysis, was also found $\chi^2=4238.13$ ve $p<0.001$. The basic components and varimax rotation method were applied in EFA and the factors were found to have an eigenvalue greater than 1 and the factor loads to be greater than 0.50 in order to find the optimal solution [17]. When Table 2 is examined, it is seen that the eigenvalues of all dimensions in the scale are greater than 1 and the factor loads are greater than 0.50. According to these results, it can be stated that the phone addiction scale consists of four dimensions and thus the scales have structural validity. The total variance was 71.83% and it was understood that it had the ability to explain.

Table 2. Telephone Addiction: EFA Results

Dimensions and Questionnaire	Mean	St.Dv.	Load
Internet Dimension (<i>Eigenvalue:7.485; VE:%46.783; α:0.900</i>)			
I'm worried that I won't be online when my phone isn't with me.	2.57	1.310	0.799
It makes me uncomfortable not being able to join social media and other online networks when my phone is not with me.	2.76	1.350	0.829
It makes me uncomfortable no being able to be notified instantly of notifications when my phone is not with me.	2.85	1.283	0.817
It makes me uncomfortable no being able to check my emails when my phone is not with me.	2.68	1.292	0.813
Deprivation Dimension (<i>Eigenvalue:1.774; VE:% 11.088; α:0.857</i>)			
I get panic when my phone runs out of charge.	3.11	1.359	0.780
If my credit or internet exceeds the quota, I get panic.	3.09	1.368	0.691
If there is no network I always check the phone until I have access.	3.32	1.281	0.728
When I can't use my phone, I feel stuck somewhere.	2.92	1.343	0.694
When I can't look at my phone for a while, I have a strong desire to look (check).	3.22	1.232	0.519
Communication Dimension (<i>Eigenvalue:1.198; VE:%7.486; α:0.865</i>)			
I'm worried that I can't reach my family / friends when I don't have my phone with me.	3.69	1.199	0.833
I'm worried that my family / friends won't be able to reach me when I don't have my phone with me.	3.69	1.221	0.866
It makes me uncomfortable not to see incoming calls / messages when my phone is not with me.	3.43	1.219	0.661
It bothers me not to see if someone is trying to reach me when I can't have my phone with me.	3.37	1.247	0.612

Freedom Dimension (*Eigenvalue:1.036; VE:%6.476; α :0.783*)

I'd be uncomfortable if I do not get access to information from my phone.	3.59	1.245	0.84
It makes me uncomfortable not being able to look at information with my phone every time I ask.	3.66	1.177	0.85
It makes me uncomfortable not being able to use my phone or its features whenever I want.	3.69	1.194	0.64
			4
			5
			1

KMO:0.918; Bartlett's Sph. $X^2:4238.134$; $p:0.000$; Total VE:%71.83

In Table 2, Cronbach's alpha coefficients (α) are presented that show the internal consistency of each structure. The most common method for evaluating the reliability (internal consistency) of the scales is the Cronbach's alpha test and it is preferred that the coefficient is greater than 0.70 [18, 19, 20]. When the alpha coefficients of all dimensions for the model are examined, it is seen that the internal consistency of the scales is high. This result shows that the sub-dimensions of the telephone addiction are reliable and the feature that the measure is likely to be accurately measured.

The Relationship between Telephone Addiction and Game Play Behavior

In order to determine the digital game addiction of participants in the survey when mobile phone usage habits of groups called addicts (game addicts), candidates (tendency to addiction) and consciousness (conscious players), obtained from the clustering analysis were examined, it was seen that addicts had the highest use in all dimensions. However, there is a statistically significant difference between the groups for internet and deprivation dimensions, but this is not the case for communication and freedom dimensions. In other words, for digital game addicts and addicted candidates, no connectivity to the internet and taking no advantage of the functions of the phone (except to not communicate with them) is an important problem (please see Table 3).

Table 3. Smart telephone usage habits by Game addiction groups: Anova results

Telephone habits	usage	Overall [n=446]	Addicts [n=94]	Candidates [n=143]	Conscious [n=209]	Anova
Internet			[2,3]	[1,3]	[1,2]	
Cluster mean		2.71	3.39	2.72	2.40	$F=26.6$
Cluster st. dev.		1.14	1.03	1.06	1.12	$P=0.00$
Withdrawal			[2,3]	[1]	[1]	
Cluster mean		3.13	3.48	3.14	2.96	$F=8.25$
Cluster st. dev.		1.05	1.01	0.98	1.07	$P=0.00$

Communication						
Cluster mean	3.54	3.61	3.51	3.53		$F=0.30$
Cluster st. dev.	1.03	0.91	1.07	1.05		$P=0.73$
Freedom		[2]	[1]			
Cluster mean	3.64	3.84	3.57	3.60		$F=2.39$
Cluster st. dev.	1.01	0.89	0.95	1.08		$P=0.09$

Notes: Numbers in brackets indicate the group numbers from which this group was significantly different at the from $p < 0.05$.

One of the topics examined in the study, it has been found that there is a relation between age of meeting with mobile phone and game addiction groups. As shown in Table 4, the age at which the first addicts meet with their mobile is earlier than the conscious statistically.

Table 4. Age by Game Addiction Groups: Anova Results

Age	Overall	Addicts	Candidates	Conscious	Anova
Age of dating phone		[3]	[3]	[1,2]	
Cluster mean	14.7	14.3	14.4	15.2	$F=8.38$
Cluster standard deviation	2.35	2.61	2.44	2.07	$P=0.00$

Notes: Numbers in brackets indicate the group numbers from which this group was significantly different at the from $p < 0.05$ level according to the LSD pairwise comparison procedure.

The Relationship between Telephone Addiction and Academic Success

The relationship between mobile phone usage habits in the study and the duration of a difficult course for the final exam (Table 5) and the overall academic average (Table 6) was examined by multiple regression analysis. Analysis results showed that there was a linear relationship between the variables and there was a relation between mobile phone usage habit, study time and grade point average.

Table 5. Multiple regression analysis: Course study time

Independent	Dimensions	Dependent	η^2R^2	β	t	F
Telephone usage habits	Internet	Average course study time	0.04	-0.100	-2.162**	5.568 ^a
	Withdrawal			-0.133	-2.868*	
	Communication			0.084	1.819	
	Freedom			-0.114	-2.463**	

^a <0.001 , * <0.01 , ** <0.05

It has been seen that the dimensions of the Internet, deprivation and freedom affect the length of time that it takes to test a difficult subject. It has been understood that the use for communication purposes does not affect the study time. Again, while the effects of Internet and freedom dimensions on the overall grade average were not affected, the effects of lack of communication and dimensions were not determined.

Table 6. Multiple regression analysis: Academic average

Independent t	Dimensions	Dependent	η^2R^2	β	t	F
Telephone usage habits	Internet	Overall academic average	0.03	-0.110	-2.351**	4.571*
	Withdrawal			-0.083	-1.786	
	Communication			0.010	0.219	
	Freedom			-0.144	-3.086*	

* <0.01 , ** <0.05

Conclusion

Smartphone technology is emerging as the mobile communication method that shows the greatest development in communication technologies. The ability of the new generation mobile phones to connect to the internet makes it possible to carry out numerous transactions on a single platform, such as mobile data sharing, up-to-date development, taking photos, taking notes, banking transactions and executing transactions with government agencies. Thanks to the mobile applications, entertainment possibilities such as playing games are very wide, that is the reason why they have become a platform that is an alternative to computers.

Portability of smartphones, which is one of the most important gaming platforms, with its ability to connect to the internet at any moment and at any time and to be a medium with extensive gaming applications, it offers the opportunity to play digital games anywhere and anytime for every age groups. In this study, the second part of a comprehensive research on digital gaming addiction (sequel to the relationship between digital gaming addiction and personal characteristics and success), the relationship between gaming addiction and smartphone usage and the effects of phone use were examined.

First of all, exploratory factor analysis was conducted to determine the habit of using the phone by using data collected from university students. As a result of the analysis, it was found that the scale of use of telephone was valid and reliable and had four dimensions (called internet, deprivation, communication and freedom) that account for about three-quarters of the variance.

In terms of digital game addiction; when the cell phone usage habits of the groups (addicts), candidates (those who tend to be addicts) and conscious (conscious players) were evaluated, it was seen that addicts had the highest usage in all dimensions.

However, there is a statistically significant difference between the groups for the dimensions of internet and deprivation, and this does not apply to the dimensions of communication and freedom. In other words, not being able to connect to the internet for digital gaming addicts and candidates and not to use the functions of the phone (except to communicate with the environment) is an important problem. Other results obtained from the other analyzes carried out in the study showed that the dimensions of internet and freedom from the dimensions of mobile phone use had a negative effect on the exam results and also on the study time with the deprivation dimension. No effect of communication size was observed.

References

1. Goswami, V. and Singh, D.R. (2016). Impact of mobile phone addiction on adolescent's life: A literature review. *International Journal of Home Science*, 2(1), 69–74.
2. Deloitte (2017). Dijitalleşen hayatımızda mobil teknolojilerin yeri, Deloitte global mobil kullanıcı anketi, https://www2.deloitte.com/content/dam/Deloitte/tr/Documents/technology-media-telecommunications/deloitte_gmcs_2017.pdf.
3. Jacobsen, W.C. and Forste, R. (2011). The wired generation: Academic and social outcomes of electronic media use among university students. *Cyberpsychology, Behavior and Social Networking*, 14(5), 275-280.
4. Erdem, H., Türen, U., and Kalkın, G. (2016). Üniversite öğrencilerinde mobil telefon yoksunluğu korkusunun (nomofobi) akademik başarıya etkisi. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 21(3), 923-936.
5. Holmgren, J. (2016). *Addiction to smartphone games: using smartphone game components to create an addiction*, Master Thesis, Sweden.
6. Yıldırım, C., Sumuer E., Adnan, M. and Yıldırım, S. (2015). A growing fear: prevalence of nomophobia among Turkish college students. *Information Development*, 32(5), 1322-1331.
7. Kwon, M., Lee, J.Y., Won, W.Y., Park, J.W., Min, J.A., Hahn, C., Gu, X., Choi, J.H., and Kim, D.J. (2013). Development and validation of a smartphone addiction scale (SAS). *PloS one*, 8(2), 1-7.
8. Bianchi, A. and Phillips, J.G. (2005). Psychological predictors of problem mobile phone use. *CyberPsychology and Behavior*, 8(1), 39-51.
9. Lemmens, J.S., Valkenburg, P.M. and Peter, J. (2009). Development and validation of a game addiction scale for adolescents. *Media Psychology*, 12(1), 77-95.



10. Irmak, A.Y. and Erdoğan, S. (2015a). Ergen ve genç erişkinlerde dijital oyun bağımlılığı: Genel bir bakış. *Türk Psikiyatri Dergisi*, 26, 1-11.
11. Irmak, A.Y. and Erdoğan, S. (2015b). Dijital oyun bağımlılığı ölçeği Türkçe formunun geçerliliği ve güvenilirliği. *Anadolu Psikiyatri Dergisi*, 16(1), 10-18.
12. Hussain, Z., Williams, G.A. and Griffiths. M.D. (2015). An exploratory study of the association between online gaming addiction and enjoyment motivations for playing massively multiplayer online role - playing games. *Computers in Human Behavior*, 50, 221-230.
13. Hazar, Z. and Hazar, M. (2017). Çocuklar için dijital oyun bağımlılığı ölçeği. *Journal of Human Sciences*, 14 (1), 203-216.
14. Young K. (2017). Internet Addiction Test (IAT). <http://www.psylegal.com.au/Awur/wp-content/uploads/2016/03/GLOBALADDICTION-Scales-InternetAddictionTest.pdf>
15. Sekeran, U. (1992). *Research methods for business, a skill building approach*. John Wiley & Sons Inc.
16. Chong, V.K. and Rundus, M.J. (2004). Total quality management, market competition and organizational performance. *The British Accounting Review*, 36(2), 155-172.
17. Nunnally, J.C. (1978). *Psychometric theory*. New York: McGraw-Hill.
18. Ravichandran, T. and Rai, A. (1999). Total quality management in information systems development: Key constructs and relationships. *Journal of Management Information Systems*, 16(3), 119-155.
19. Jonsson, P. (2000). An empirical taxonomy of advanced manufacturing technology. *International Journal of Operations and Production Management*, 20(12), 1446– 1474.
20. Hair, J.F., Anderson, R.E., Tatham, R.L. and Black, W.C. (1998). *Multivariate data analysis*. Englewood Cliffs, NJ: Prentice-Hall.



Cognitive Networks for Internet of Toys

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Abstract

Cognitive networks use different cognitive processes to sense existing conditions, make decisions based on findings and then start to learn from those decisions in a data communication network. From communication to networking, wireless technology has been part of the personal and professional lives of people. Network becomes cognitive if all operating components are self-adjusting and self-aware according to different unpredictable network conditions for optimizing data transmission performance. Traditional networks work with wireless links using predetermined parameters. Cognitive networks should perform high level point-to-point task over time and provide improved quality of service, secured communication, control over access and other general networking goals. A cognitive network should be proactive for predicting usage cases before occurring and adapt to those previously. Toys are an essential part of our culture, and they evolve as our technology evolves. The toy industry is continually expanding, offering up new products kids want and parents purchase, but with such an abundance of toys on the market, it's difficult to determine which toys are actually the best both for your child's brain and for your checkbook. Connected toys incorporate Internet technologies that respond to and interact with children. The foundation of Internet connected toys is data exchange. Data exchanged between the child and the platform, between the child and the parent, etc. They are sometimes equipped with speech recognition and activation and appear to react to the words of the user. They may also be controlled remotely across network infrastructure, for example via smartphones or tablets connected to the same network. Smart toys have been recently introduced in our market as conventional toys equipped with electronic components and sensors that enable wireless network communication with mobile devices that provide services to enhance the toy's functionalities. This environment, also called toy computing, provides users with a more sophisticated and personalised experience since it collects, processes and stores personal information to be used by mobile services and the toy itself. Internet of Toys can be defined as a part of Internet of Things concept. The diffusion of Internet-connected toys is expected to grow significantly in the next few years. The distinction between smart toys and connected toys is therefore important, since a smart toy is not necessarily connected to the Internet while a connected toy is not necessarily smart. The software and algorithms of these toys are not owned by the users, who only have licenses to use these in much the same way as social network sites or mobile apps. Software and algorithms can be updated and changed at any time by the manufacturer. This study aims to introduce a communication model for Internet of Toys based on a Cognitive Network infrastructure. In the suggested model, connected smart

toys using adaptive connection and transmission modes are explained within the concept of Internet of Things. In this study, smart toys with adaptive wireless connection capabilities are configured to establish an Internet of Toys model for analyzing cognitive networking abilities of the components in the system.

Keywords: Internet of Toys, Cognitive Networks, Internet of Things / Toys

1. Introduction

The term cognitive is related with the ability of a network aware of its operational status and adjust operational parameters to fulfill specific tasks, such as detecting changes in the environment and user requirements. They are called intelligent as they are aware of everything happening in devices and networks they are connected to. Using this awareness, they can adjust their operation to match current and upcoming network conditions.

As the Internet’s global importance grows and users demand access while mobile, wireless networks have been a major area of research for communications. Many different types of wireless network have been identified, each with their own technical requirements. Cloud computing technologies have been developed rapidly and generated significant impacts on how citizens and businesses use technology and individuals live their everyday lives. In addition to the traditional desktop and laptop computers, smartphones and mobile devices and Internet of Things (IoT) are all connected to the Internet and become part of the cloud. Due to the new concepts, new services and applications have been developed. The connection of everyday devices, such as home appliances or specialised equipment such medical devices to the cloud technologies lead to our focus of research area.

1.1. Wireless Networks

Today’s world is obviously operated by technology with the presence of wireless gadgets ranging from big to small sizes with varying costs. Since problems arise due to the increasing demands in services concerning networking technologies, cognitive networks can be used as a resolution. The present technology used in data networking is limited and not open to possible changes leading to low quality performance and results.

The limitations of the current data networking technology include the limitations in response, state and scope mechanism, which lead to the incapability of network elements such as nodes, protocol layers, policies and behaviors to perform intelligent adaptations. With this, the concept of cognitive networks is to be presented to the people for their comprehension on its benefits on modern ways of communication, information and learning. Network becomes cognitive if all operating components are

self-adjusting and self-aware according to different unpredictable network conditions for optimizing data transmission performance.

Network itself should find optimal ways of connecting devices and tuning network parameters to achieve best performance for data transfers. In a cognitive network, judgments are made to meet the requirements of the network as an entire system, rather than the individual network components. The main reason of the emergence of cognitive networks is to achieve the goal of building intelligent self-adjustable networks and in the same time improve the performance. Intelligent self-adjustable networks will be able to use intelligence to determine ideal network operating state for many tunable parameters.

2. Cognitive Networks

A cognitive network has its own point-to-point goal-based data flow and is designed to go beyond self-modification. Traditional networks work with wireless links using predetermined parameters. Cognitive networks should perform high level point-to-point task over time and provide improved quality of service, secured communication, control over access and other general networking goals. A cognitive network should be proactive for predicting usage cases before occurring and adapt to those previously. If cannot predict, returns back to reactive method for finding optimal way of handling the new situation. It learns from every case encountered and uses gained information to increase network efficiency and performance.

Main aim is to optimize data communication for whole network between the sender and the receiver to meet required point-to-point goals of users in the network. In a cognitive network, autonomous and adaptive radios select their operating parameters to achieve individual and network-wide goals. Network becomes cognitive if all operating components are self-adjusting and self-aware according to different unpredictable network conditions for optimizing data transmission performance. Network itself should find optimal ways of connecting devices and tuning network parameters to achieve best performance for data transfers. In a cognitive network, judgments are made to meet the requirements of the network as an entire system, rather than the individual network components.

The main reason of the emergence of cognitive networks is to achieve the goal of building intelligent self-adjustable networks and in the same time improve the performance. Intelligent self-adjustable networks will be able to use intelligence to determine ideal network operating state for many tunable parameters.

3. Connected Toys

Technological developments have created new opportunities for toy developers in their innovation processes. While certain internet-connected toys are part of some children's everyday experiences, they are yet to become an everyday experience for most young

children. A toy can be called “intelligent” if it has a detailed profile on a child that it remembers and act on.

Toys are an essential part of our culture, and they evolve as our technology evolves. The toy industry is continually expanding, offering up new products kids want and parents purchase, but with such an abundance of toys on the market, it’s difficult to determine which toys are actually the best both for your child’s brain and for your checkbook. Toys aren’t just for entertainment. Toys are known to improve your child’s ability to solve problems, get along with others, and improve language and motor skills. But today’s latest smart toys go a step further helping children better develop the parts of their brain that will be useful in our tech-advanced world, such as toys that help children learn to code or communicate using smart devices.

3.1. Intelligent Smart Toys

Smart toys have been recently introduced in our market as conventional toys equipped with electronic components and sensors that enable wireless network communication with mobile devices that provide services to enhance the toy's functionalities. This environment, also called toy computing, provides users with a more sophisticated and personalised experience since it collects, processes and stores personal information to be used by mobile services and the toy itself.

An intelligent toy is a personal playmate that guides the child. Algorithms act on, inform and direct an intelligent toy's interaction with a child. Connected toys, on the other hand, incorporate Internet technologies that respond to and interact with children. The foundation of Internet connected toys is data exchange. Data exchanged between the child and the platform, between the child and the parent, etc. They are sometimes equipped with speech recognition and activation and appear to react to the words of the user. They may also be controlled remotely across network infrastructure, for example via smartphones or tablets connected to the same network. Internet of Toys can be defined as a part of Internet of Things concept.

3.2. Internet of Toys

By their nature, smart toys raise a different concern beyond child safety: security. Smart toys may manipulate confidential data such as private information and localisation, for example. In conventional systems, sometimes users may allow third parties to access their private information for marketing or customisation process. However, children are considered vulnerable users that may not make informed decisions about their own privacy policies. Although parental control mechanisms, such as parents account and parents’ consent interfaces, can mitigate relevant privacy issues, they aren’t able to avoid attacks that compromise other security aspects, including information theft and denial of service.

These toys often use sophisticated sensor-based technologies to collect information from children and cloud-based platforms to process this information through real-time interactions. This cloud-based processing relies on sophisticated algorithms that can simulate human intelligence and deliver more personalized or individualized responses to children. However, the diffusion of Internet-connected toys is expected to grow significantly in the next few years. The distinction between smart toys and connected toys is therefore important, since a smart toy is not necessarily connected to the Internet while a connected toy is not necessarily smart. The software and algorithms of these toys are not owned by the users, who only have licenses to use these in much the same way as social network sites or mobile apps. Software and algorithms can be updated and changed at any time by the manufacturer.

4. Conclusion

Smart toys are simply more advanced toys which typically have their own intelligence built-in through on-board electronics. Sometimes these toys can be networked together with other smart toys or a personal electronic device, such as a computer or smart phone, in an effort to enhance its play value or educational features. However, the diffusion of Internet-connected toys is expected to grow significantly in the next few years. The distinction between smart toys and connected toys is therefore important, since a smart toy is not necessarily connected to the Internet while a connected toy is not necessarily smart. The software and algorithms of these toys are not owned by the users, who only have licenses to use these in much the same way as social network sites or mobile apps. Software and algorithms can be updated and changed at any time by the manufacturer. Smart toys help kids better adapt to the culture and environment that they are raised to be a part of. For many children today, this means they are toys that help children better understand the use of technology and how to master it. While traditional toys are designed for entertainment alone, smart toys allow children to learn as they play. Many advocates of smart toys also cite that children learn more effectively with good interactive software.

References

- 1) Baraniuk, C., 2016. Call for privacy probes over Cayla doll and i-Que toys. BBC News, Technology, 6 Dec 2016. Accessed 12 Dec 2016, available at <http://www.bbc.com/news/technology-38222472>.
- 2) Carvalho, L. and Eler, M. Security Requirements for Smart Toys. In Proceedings of the 19th International Conference on Enterprise Information Systems (ICEIS 2017) – Vol. 2, pp. 144-154 ISBN: 978-989-758-248-6
- 3) Fortuna, C., & Mohorcic, M. (2009). Trends in the development of communication networks: Cognitive networks. *Computer networks*, 53(9), 1354-1376.
- 4) Fox-Brewster, T., 2016. Hackers Could Have Turned Vulnerable Smart Teddy Bear Into Demon Toy. Forbes, Security, 2 Feb 2016. Accessed 08 Dec 2016,



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- available at <http://www.forbes.com/sites/thomasbrewster/2016/02/02/fisher-price-hero-vulnerable-tohackers/#359130c71cfe>
- 5) Hackett, R., 2016. This FisherPrice Smart Toy Bear Had Data-Leak Vulnerability. *Fortune, Tech Internet of Things*, 2 Feb 2016. Accessed 08 Dec 2016, available at <http://fortune.com/2016/02/02/fisher-price-smarttoy-bear-data-leak/>
 - 6) Haykin, S. (2005). Cognitive radio: brain-empowered wireless communications. *IEEE journal on selected areas in communications*, 23(2), 201-220.
 - 7) Mahmoud, Q. (Ed.). (2007). *Cognitive networks: towards self-aware networks*. John Wiley & Sons.
 - 8) Newman, J. 2015. Internet-connected Hello Barbie doll can be hacked. *PCWorld, Security, News*, 7 Dec 2015. Accessed 12 Dec 2016, available at <http://www.pcworld.com/article/3012220/security/internet-connected-hello-barbie-doll-can-be-hacked.html>
 - 9) Ng, M., Chow, M., Salgado, A., 2015. Toys and Mobile Applications: Current Trends and Related Privacy Issues. *Mobile Services for Toy Computing. International Series on Computer Entertainment and Media Technology*, Springer, 2015, p. 51-76. ISSN 2364-947X.
 - 10) Rafferty, L.; Hung, P., 2015. Introduction to Toy Computing. *Mobile Services for Toy Computing. International Series on Computer Entertainment and Media Technology*, Springer, 2015, p. 1-7. ISSN 2364-947X.
 - 11) Thomas, R. W., Friend, D. H., DaSilva, L. A., & MacKenzie, A. B. (2007). Cognitive networks. In *Cognitive radio, software defined radio, and adaptive wireless systems* (pp. 17-41). Springer, Dordrecht.



Digital Parentship for Keeping Children Safe Online

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Abstract

The digital world is very complicated, risky and challenging as it has little respect for age. The digital parent is one who uses one or more of digital media applications and devices in his/her daily activities, especially for parenting. Digital parents are active partners in their child’s digital life and Internet usage. Because so many online services and content providers are free, advertising has emerged as a way of funding the internet, which explains its ubiquity. But as is so often the case with new technology, mass marketing may have come into place before we fully understood its effects. Despite the risks that children face online, the internet remains one of the most wonderful resources humans have ever had. An overwhelming majority of parents practicing this parenting style prefer not to research on new tech, programs and apps to share with their children and they rarely talk with their kids about tech. They also don’t put any effort into investing in their kids’ tech skills. Often we focus myopically on danger and risk, neglecting all the positives and opportunities the online world offers to children in the interest of keeping them safe. Parents should talk to their children about the impact of seeking approval from the online world and comparing their lives to the edited versions of other people’s lives. Parents must help them mentally disconnect from the constructed identities they’ve created online and allow them to gain the freedom to know who they really are. You should look at some newsfeeds with your kids and point out the people that do social media right and those that do it all wrong. Internet service providers have rolled out free parental controls to all customers, age verification tools have become more advanced and, where risky content was also illegal, government and industry have worked together to have it removed. Filters and parental controls offer a partial solution to these issues, and few would argue against keeping graphic or disturbing content away from children. But technological and social realities mean filtering can only serve as one, limited part of a strategy to safeguard children. Once again many of our young people are hanging out in places they are not always ready for, and so we as adults with the wisdom of years and experience, must step in to help them with that. On the other hand a teenage boy or girl may be quite OK with the decisions they are making and feel quite comfortable living with any such consequences. Within the study, opinions of parents having different socio-economic and educational backgrounds are queried and analyzed for discovering how they behave in digital world to help and accompany with their children for their mental development. Results from different academic and field studies in the literature are summarized and presented for discussing new techniques for keeping children safe in different online applications and

environments. Additionally, semantic analysis is suggested for effective protection of children in online environments.

Keywords: Digital Parentship, Internet Safety for Children, Online Safety for Children

1. Introduction

All around the world, children have an incredible opportunity to learn, create and communicate by using technology. The digital world is very complicated, risky and challenging as it has little respect for age. The digital parent is one who uses one or more of digital media applications and devices in his/her daily activities, especially for parenting. As we all in the digital age, digital natives having children turned into the digital parents. Digital parents are active partners in their child’s digital life and Internet usage. In addition to teaching computer usage to children, the digital parent is best suited to guide the child on issues of online safety, and digital citizenship. As parents, we cannot isolate them from the digital world around them but can make it a safer place. It is important that parents are confident in their understanding of digital devices, applications, games, and their ability to help guide their children at every age to ensure a positive experience online. Because so many online services and content providers are free, advertising has emerged as a way of funding the internet, which explains its ubiquity. But as is so often the case with new technology, mass marketing may have come into place before we fully understood its effects.

2. Digital Parents

Digital parents play a key role in shaping how their children use the digital media, being perhaps the first and most important mediator of digital use of children. Three types of digital parents: limiters, enablers and mentors: Limiter parents prefer to bring up their kids offline as much as possible and they do their best to limit their screen time. An overwhelming majority of parents practicing this parenting style prefer not to research on new tech, programs and apps to share with their children and they rarely talk with their kids about tech. They also don’t put any effort into investing in their kids’ tech skills. As a result of being kept out of the digital world, their kids become digital exiles. They lack the knowledge, skills and etiquette to become responsible digital citizens and are unprepared for what the internet holds. Digital limiters and digital enablers are on opposite sides of the digital parenting spectrum. Where limiters place strict controls on their kids’ screen time, enablers place none. They take a relaxed laissez-faire approach to the digital world. While they do recognize that the internet and tech are a huge part of their children’s online lives, they rarely provide guidance in exploring this world. They trust their kids to make their own choices online and leave them to their own accord. Other studies have also linked unfettered screen time to teen depression and suicidal behavior. Digital mentors are those who have found a happy middle ground between being digital limiters or enablers. These parents realize the importance of the online

world and do their best to mold their kids into responsible digital citizens. Digital mentors are proactive parents who not only enjoy spending time with their kids online but also actively cultivate their children’s digital skills by enrolling them in various tech classes, workshops or camps. They also make a point of researching specific apps, programs or devices so they can understand what they’re all about before introducing them to their kids. Instead of approaching tech and the internet with fear, they choose to make informed decisions.

2.1 Online Environments

Children might see something online that is intended for adults, which could confuse or upset them. This might be violent or sexual content, extreme opinion or anger, or inappropriate advertising. Inappropriate can mean different things to different people, from swear words to pornographic images or videos, and what is inappropriate for your child will also change as they grow and develop. Despite the risks that children face online, the internet remains one of the most wonderful resources humans have ever had. You should let them play around with social media whilst you can still keep an eye on what they are doing and ‘teach’ them how to behave. Use these early days as a real teaching opportunity. A window that may be closed all too soon. You should know that this is the world your child is growing up in and it is the only world they have ever known. We need to come to terms with incorporating the technology in to our lives. We must embrace and promote the opportunities that it offers rather than simply looking for ways to avoid it and minimise the effects. Doing these things will allow us to be proactive in this space. It will give our children the confidence to make the very best choices and remind them that we are still relevant to their world.

2.2. Online Safety

Internet service providers have rolled out free parental controls to all customers, age verification tools have become more advanced and, where risky content was also illegal, government and industry have worked together to have it removed. Filters and parental controls offer a partial solution to these issues, and few would argue against keeping graphic or disturbing content away from children. But technological and social realities mean filtering can only serve as one, limited part of a strategy to safeguard children. It is important to remember that parental controls and filters are just tools. They are not 100% accurate and are no substitute for open and honest conversations with your child. The role of parents and careers in protecting children and supporting their resilience is obvious.

Despite the risks that children face online, the internet remains one of the most wonderful resources humans have ever had. Often we focus myopically on danger and risk, neglecting all the positives and opportunities the online world offers to children in the interest of keeping them safe. If a person is unaware of the dangers they are in due to their age and development, or if they are unaware of the hurt they are causing or having done to them, then they need to be pulled up on this as part of the teaching process.

Filters and parental controls offer a partial solution to these issues, and few would argue against keeping graphic or disturbing content away from children. But technological and social realities mean filtering can only serve as one, limited part of a strategy to safeguard children.

3. Digital Parentship

Digital parents should be aware of making children resilient enough to cope with the challenges of a digital world is the best way of keeping them safe. On the other hand, the internet can be fantastic for children with learning disabilities and autism. Safety is the main concern for all parents, but it's just as important to help your child get the most from the digital world. For example, if your child has difficulty communicating in the offline world, they may find it easier to socialize online. The Internet can also be a valuable educational resource, especially for children who take longer to learn new things. Parents should talk to their children about the impact of seeking approval from the online world and comparing their lives to the edited versions of other people's lives.

3.1. Safety for Children

Parents must help them mentally disconnect from the constructed identities they've created online and allow them to gain the freedom to know who they really are. Families must value their mental health as much as their physical wellbeing and help them learn to use social media as a tool for growth and development. Defining regulations and/or putting restrictions are not the solutions for keeping children safe. Parents should talk to their children about the impact of seeking approval from the online world and comparing their lives to the edited versions of other people's lives. Parents must help them mentally disconnect from the constructed identities they've created online and allow them to gain the freedom to know who they really are.

Families must value their mental health as much as their physical wellbeing and help them learn to use social media as a tool for growth and development. “Prevention is better than the cure”. An important philosophy that highlights the need to be proactive with many aspects of our lives. When it comes to cyber safety and digital parenting, it is a philosophy we certainly need to be espousing and working hard to ensure becomes the norm in both our teaching and our attitude. Gone are the days when we hear something bad happened on an app so we simply ban it. Gone are the days when we can say ‘don't talk to people online if you don't want to get bullied’.

4. Conclusion

Some kids hang on every word, scared by the notions of predators lurking behind the screen, or a life in ruins after a misplaced tweet or the social suicide that comes from an embarrassing photo or video that goes viral. Sometimes our words of warning are enough for these kids. But increasingly, research and experience shows us, that simply raising awareness does not always translate in to long term changes. Gone are the days

where we simply took away the technology for weeks at a time in order to handle a transgression or counter a tantrum. The technology and the devices are now so intricately and completely woven in to the fabric of our lives, and more importantly into the lives of our children, that we would be neglectful to simply rely on these reactive measures to keep them safe and smart and in control. We try valiantly to drum in to our kids the dangers of a life lived largely online. We highlight the bad things that happen to others in order to prevent them happening to our own offspring.

References

- 1) BBC (2017). Online safety: Internet 'not designed for children' - BBC News. [online] BBC News. Available at: <http://www.bbc.co.uk/news/education-38508888>
- 2) Beheshti, J. and Large, J. (2013). The information behaviour of a new generation. 1st ed. Lanham: Scarecrow Press, p.65.
- 3) Blank, D. (2017). Cyberbullying rises as social media does. [online] The Herald-Tribune. Available at: http://www.batesvilleheraldtribune.com/news/local_news/cyberbullying-rises-as-social-media-does/article_12224023-c9bc-5db2-bbc0-0c706502cc79.html
- 4) Clauson, K. and Vieira, K. (2011). Safety and Security on the Internet. 4th ed. [ebook] Switzerland, pp.14-16. Available at: http://www.who.int/goe/publications/goe_security_web.pdf
- 5) Freeman, K. (2013). How to Protect Your Children From Phishing Scams. [online] Mashable. Available at: <http://mashable.com/2013/01/15/protect-children-phishing-scams/#0kEBcXnEUuqh>
- 6) Giant, N. (2013). E-Safety for the i-Generation: Combating the Misuse and Abuse of Technology. 1st ed. [ebook] pp.33-34. Available at: <https://books.google.co.uk/books?id=00Sb6wfiWw8C&pg=PA44&dq=e-safety&hl=en&sa=X&ved=0ahUKEwjdoWo4pPTAhUrIsAKHWsqCS0Q6AEIjAB>
- 7) Hendricks, D. (2014). The Shocking Truth About Social Networking Crime. [online] Socialnomics. Available at: <http://socialnomics.net/2014/03/04/the-shocking-truth-about-social-networking-crime/>
- 8) Johnson, M. (2016). Cyber Crime, Security and Digital Intelligence. 1st ed. p.123.
- 9) Kummer, M. (2012). Children and the Internet. [online] Internetsociety. Available at: <https://www.internetsociety.org/sites/default/files/bp-childrenandtheintern>
- 10) Lonie, N. (2014). Online Safety for Children and Teens - A Parent's and Carer's Guide. 1st ed. [ebook] p.85. Available at: <https://books.google.co.uk/books?id=VAqWBAAQBAJ&pg=PA85&dq=hacker+children&hl=en&sa=X&ved=0ahUKEwjzvMDPxZXTAhVMCMAKHVYXADQQ6AEIMzAE#v=onepage&q=hacker%20children&f=false>



- 11) Mitra, S. (2013) The Guardian. The Internet can harm, but can also be a child's best tool for learning. Available at: <https://www.theguardian.com/commentisfree/2013/nov/03/child-safety-internet-web-access>
- 12) Palmer, K. (2014). How to Protect Kids' Privacy Online. [online] U.S.News. Available at: <http://money.usnews.com/money/personal-finance/articles/2014/03/05/how-to-protect-kids-privacy-online>
- 13) Roberts, L. and Samani, R. (2013). Digital Deception: The Online Behaviour of Teens. 1st ed. [ebook] UK: McAfee, pp.2-3. Available at: https://www.internetmatters.org/wp-content/uploads/2015/12/mcafee_digital-deception_the-online-behaviour-of-teens.pdf
- 14) Smith, G. (2007). How to Protect Your Children on the Internet: A Roadmap for Parents and Teachers. 1st ed. [ebook] p.41. Available at: https://books.google.co.uk/books?id=4_VEc4bJcdkC&pg=PA41&lpg=PA41&dq
- 15) WeLiveSecurity. (2015). Why parents must teach their children about internet security. [online] Available at: <https://www.welivesecurity.com/2015/09/25/parents-must-teach-children-internet-security/>



Evaluation of the Impacts of Digital Games on Health

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Summary

Digital games are defined as games that are programmed with various technologies, enable users to log in with a visual environment, manipulate them within the environment that the game is presented and as the games which have become a popular culture for children. Today, the use of digital games are preferred by every age group gradually yet the usage in early childhood period has both positive and negative impacts on child's development and health and on the other hand, the opportunities and facilities of the digital world have been used in many different areas. With the increase in the number of the games in the digital field, the game type that is described as serious games has also become popular. Serious games are regarded in the science world both as an entertaining and intervention type made via a computer.

A child who plays digital games spend more time inside instead of making sports outside, the risk of obesity increases, the risk of technological addiction emerges, the risk of being exposed to an inappropriate content appears. Excessive use of technology affects child's physical development negatively. A correlation has been found between the situation of children between the ages of three and five to spend 4,5 hours in front of a screen and their developmental delay. %19 of children between two-five years old use smart phones yet their skills of swimming, lacing up their shoes and preparing their own food are not developed. There are studies which show that excessive use of internet has impacts on cardiological problems and diabetes. Movement, touching, human interaction and nature which are the main factors of healthy development and learning in early childhood are decreasing in a very serious extent with the intense indoor use of mobile devices. Many studies have been conducted on the impacts of cell phone radiation on the brain and memory. Especially, as the skulls of the young children are not fully developed, the impact of electronic magnetic radiation may have two times more impact on children. There are studies that demonstrate that the excessive and irregular use of technology causes sleeping disorders, postural and skeletal problems and visual impairments and also affects the brain negatively.

In the world, games and education are being used together. Gaming is an effective method of increasing perception and awareness of people. Serious games which have a purpose beyond entertainment have a gradually increasing impact in real life as they can be used in all spheres of life. In this way, an awareness can be raised in different areas as children's education to health education via digital games. Digital games have positive impacts on healthy lifestyles and its determinants, particularly in the knowledge and clinical results. There are studies which show that digital health games ease the patients'

experiences during the treatment period in psychotherapy and physiotherapy implementations and in the case of cancer and hospital care also for the patients with serious pain and in many different situations. Digital health games are used in terms medicine education, particularly in the surgical field with the purpose of acquiring skills and in addition, they are also used in diagnosis and treatment phase by uploading all the data of the patient. As a result, digital games improve health and provision of health care services.

As everything in life, a certain standard does not exist for digital games. Games which have low and high qualities are on the market. The important thing in terms of digital health, first of all, to protect child’s health, is to prefer games with a right choice/right amount (as time) and for right age and to provide a transformation from “exposure” to “controlling”. It is estimated that digital health games will be more effective in terms of improving health in the future. In this context, benefitting from the applications of digital health games accurately and effectively in Turkey seems possible with the collaboration of all stakeholders with multidisciplinary studies.

Key Words: Health, Digital Games, Health Care, Education, Medicine

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Introduction

Play, which is an action that human beings maintain since their existence, starts with the life and continues in every period of life by altering and developing; and preserves its importance by being the most satisfactory source of different interests and needs. A play is an amusement which develops talents, and intelligence provides good-time with certain rules. Children learn about the concept and mental processes such as shapes, size, color, weight, volume, quantification, counting, time, space and distance through games. Saracho (2002), stated that the factors as the age of the child, playing environment, playing materials and technology affects the playing behavior of a child. Digital games replace children’s plays slowly. It has been found that digital games fulfil the needs of a child as instinctive achievement and advancement and development in the process of development and numeric games strengthen eye-hand coordination, problem-solving and multitasking ability. According to the studies, it has been known that hyperactivity and attention deficit disorder seen more frequently in children who play computer games excessively and spending too much time on internet leads to depression and loss of social relations and obesity (1).

In the study conducted by Hazar et. al which compares traditional games and digital games through metaphors, the explanations made through ‘health images’ the

metaphors of ‘benefit, medicine, health, vitamin’ come to the forefront in terms of traditional games and ‘eyesight deterioration’ for digital games(2).

Digital Games and Health

Griffiths and Meredith (2009) state according to a study that digital games have various impacts on children. These impacts usually appear as carpal tunnel syndrome, xerophthalmia, headache and back pain, irregular eating habits, lack of self-care and sleeping disorders (3).

Particularly, spending long period of time in front of a computer may lead to musculoskeletal disorders due to sitting and standing positions, vision disorders, electromagnetic radiation problems, creative and mental development hazards, decline in language skills, epileptic seizures in some children, decline in academic success, problems in brain development, complications in social development in children in developmental age (4).

Remaining inactive for a long time and being strained bring about neck pain and neck stiffness. A child who plays digital games spend more time inside instead of making sports outside, the risk of obesity increases, the risk of technological addiction emerges, the risk of being exposed to an inappropriate content appears. Excessive use of technology affects child’s physical development negatively. A correlation has been found between the situation of children between the ages of three and five to spend 4,5 hours in front of a screen and their developmental delay. %19 of children between two-five years old use smart phones yet their skills of swimming, lacing up their shoes and preparing their own food are not developed. There are studies which show that excessive use of internet has impacts on cardiological problems and diabetes. Movement, touching, human interaction and nature which are the main factors of healthy development and learning in early childhood are decreasing in a very serious extent with the intense indoor use of mobile devices. Many studies have been conducted on the impacts of cell phone radiation on the brain and memory. Especially, as the skulls of the young children are not fully developed, the impact of electronic magnetic radiation may have two times more impact on children. There are studies that demonstrate that the excessive and irregular use of technology causes sleeping disorders, postural and skeletal problems and visual impairments and also affects the brain negatively. Signs of tiredness, eye burning and itchiness emerge in eyes that focus on a fixed point for a long time (2).

Excessive use of technology affects the physical development a child negatively. It was also found that using technological device one-two hour longer than the duration that is suggested by experts increase the risk of psychological disorder %60 in children (5).

Computer games cause players to forget about himself/herself, time, eating and drinking by providing an action. The player is absorbed by the game from emotional, cognitive and motivational dimensions and becomes timeless. The thoughts of hallucination,

insanity and schizophrenia emerge in children and young people who play computer games. Playing computer games gives rise to spending less time for responsibilities in children and young people. They start to avoid common activities and trips. In terms of children who prefer to play games that require one player instead of multiple players, the language becomes vulgar and accordingly, their competences of understanding connections are reduced. Playing computer games for a long period of time by children and young people causes muscle pain, paraesthesia in hands and arms and forearm fractures. Peracute contradictions occur in players' bodies during playing. It also gives rise to high blood pressure and e-Thrombose in children over a certain age. Spending a long time in front of a computer affects such kind of pathomechanisms. The excessive calories in the body and lack of energy consumption lead to cardiovascular diseases, diabetes and high cholesterol (6).

According to the assumption of “Digital games influence children from a psychological perspective”, the responses received from children who play computer games relatively more or less were evaluated. According to this, participants state that they are positively or negatively influenced in emotional terms by winning or losing the game that they play during their daily lives minimum for 10 minutes and maximum for an hour. If this situation is considered from the neurophysiological perspective, the dreams arise due to the impact of digital games on the subconscious, enable the learning of images presented in the game (7).

The games that do not only aim to entertain yet aims to teach along with entertaining are termed as serious games. Regardless of individuals' ages, it is known that they enjoy the activities under the name of playing a game more than job-related activities. In addition, it was determined that learning is actualized more as a result of the activity. Well-designed computer games are started to be preferred in terms of the education of both adults and children. This situation demonstrates that the idea of using games only for entertainment disappears gradually. Serious games contribute abilities to individuals such as problem-solving, analytic thinking, strategy developing, communication skills and confidence. Besides motivating learners, serious games also help them to increase their real potential. Individuals who learn to work together by playing computer games receive positive results in terms of both academic acquisitions and social relations (8)

With the popularity of digital games, game-based learning has also started to drawn attention. In these new methods of learning, the real and virtual worlds are integrated into each other by creating fictions via digital devices. The learning aimed- games in the field of health are used for improving health knowledge, skills and behaviors. Digital health games are good examples of using digital technology in improving health and the number of games and their utilization increase gradually. The different visual, aural and written types of communication provide learning methods which are different and more creative (9). Serious digital games are both entertaining and they are types of intervention distributed through computers.

Digital games are different from the other interventions performed via computers as they are profoundly attraction-grabbing, pleasant and internal-motivation oriented. Serious games exist in different fields such as military, health and education. Employing games in education also attracted the attention of health development experts. The game named Packy/Marlon, which was developed towards diabetes in Japan in the year of 1955 is one of the pioneers in this field. Digital health games can be defined, in the framework of health development, as digital games that are played with the purpose of providing information on health, positive health and healthy lifestyle. Health games enhance knowledge, change attitudes, and create positive changes in terms of and health. Digital health games are an example of developing health in a digitalized way. Digital health is a comprehensive term towards using technology in health education, health development and public health practices. Digital health can be defined as the use of information and communication technologies by individuals and societies in terms of health development and health services. On the other hand, “digital health development” is a subset of digital health, and digital health games are also included in this set (9).

According to Kreps et. al, health communication field is a broad subject with different levels. These levels consist of an intra-personal level (interpersonal communication level, group health communication level and institutional communication level). Ratzan et. al added mass communication and public communication to the definition made by Kreps. Today, the health communication literature includes two different converging fields of research that involves all of these areas. In this context, the first field is the field of presentation of health services, and the other is developing the public health of the media and use of media in an effective and persuasive manner. According to Kreps, these two branches of health communication fields will continue to develop together and eventually will be converged. The convergence of the aforementioned branches will be substantially advantageous because the presentation of health services and health development are activities which are closely associated with each other (10).

The learning-oriented games in the field of health are used in terms of developing health knowledge, skills and behaviors. Digital health games are good examples of using digital technology in terms of health development and regarded as a creative and effective strategy in public health protection and establishing health literacy. The main purpose of games is entertainment. The games that are called “serious games” which have been becoming popular gradually today are defined as games that are used for non-entertaining purposes. A part of health games are oriented towards acquiring medical skills and health. Despite the fact that digital health games are advantageous in terms of certain aspects they also have limitations. The time and cost are the primary issues. In addition to the positive aspects of games such as increasing cognitive skills, providing cognitive, emotional and social development and even increasing academic success when they are played moderately in terms of duration; they also pose a risk of addiction, physical inactivity and other virtual environment risks such as other games. When the academic dimension is considered, it can be said that interdisciplinary studies are required in order to fill the gap in the literature and involve the main dynamics of the

game-producing process and user experience. Particularly, studies which bring researchers from the fields of communication, informatics and health sciences together through common projects will provide findings in order to create higher quality digital health games (9).

The demand of the public to have competent doctors yet avoiding from an object of education reveals the contradiction between medical services and education. One of the most innovative techniques to relatively solve this issue is the simulation-based medical training applications (11).

New technologies such as virtual reality and e-learning applications bring new possibilities not only in the field of medical training but also for other health professions and could lead to valuable improvement in learning outcomes. Friedman described the importance of using new media in medical education . Besides traditional surgical simulators that use computer technology to offer the medical personnel a tool for skills training, there is another tool that uses also computer technology that healthcare workers can practice with serious game. Using Stokes (2005)' definition as “games thar are designedto entertain players as they educate, train, or change behaviour. These technologies can be also useful for patients, in order to teach them procedures regarding their health habits. For example, a serious game was used to teach healthy alimentary habits in patient with diabetes. Surgery, radiology, odontology, nursing, first aid, dietitian and diabetes, psychology are the application area of the serious games. There is a seious game that has the aim to teach medical students the organizational and conceptual basics of the medical practice of a general practitioner in a problem-based learning environment (12)

In the world, games and education are being used together. Gaming is an effective method of increasing perception and awareness of people. Serious games which have a purpose beyond entertainment have a gradually increasing impact in real life as they can be used in all spheres of life. In this way, an awareness can be raised in different areas as children's education to health education via digital games(13). Digital games have positive impacts on healthy lifestyles and its determinants, particularly in the knowledge and clinical results. There are studies which show that digital health games ease the patients' experiences during the treatment period in psychotherapy and physiotherapy implementations and in the case of cancer and hospital care also for the patients with serious pain and in many different situations. Digital health games are used in terms medicine education, particularly in the surgical field with the purpose of acquiring skills and in addition, they are also used in diagnosis and treatment phase by uploading all the data of the patient. As a result, digital games improve health and provision of health care services (14).

Conclusion

As everything in life, a certain standard does not exist for digital games. Games which have low and high qualities are on the market. The important thing in terms of digital health, first of all, to protect child’s health, is to prefer games with a right choice/right amount (as time) and for right age and to provide a transformation from “exposure” to “controlling”. It is estimated that digital health games will be more effective in terms of improving health in the future. In this context, benefitting from the applications of digital health games accurately and effectively in Turkey seems possible with the collaboration of all stakeholders with multidisciplinary studies.

References

- 1-Budak, O. (2017). Preschool Teachers’ and Mothers’ Perspectives on Digital Children’s Plays. *The Journal of International Education Science*. 4(13), 158-172.
- 2-Hazar, Z., Hazar, K., Gökyürek, B., Examination of the Relationship between Secondary School Students’ Playfulness, Digital Game Addiction and Aggression Levels from The Perspective of Different Variables. *International Journal of Human Sciences*. 14(4), 4320-4332.
- 3-Hazar, Z., Hazar, K., Gökyürek, B., Examination of the Relationship between Secondary School Students’ Playfulness, Digital Game Addiction and Aggression Levels from The Perspective of Different Variables. *International Journal of Human Sciences*. 14(4), 4320-4332.
- 4-Arnas, Y.A.,(2005) 3-18 Evaluation of Using Interactive Communication Tools Habits of Children and Young People in 3-18 Age Group. *The Turkish Online Journal of Educational Technology–TOJET*. 4(9) 59-66.
- 5-Güngör, H., Ogelman, H.G., Sarıkaya, H.E., Körükçü, Ö. (2015). Preschool Children and Mobile Devices. *International Journal of Family Child and Education*. 6, 1-24.
- 6-Uysal, D. (2017) Effect of Addiction, Violence and Loss of Identity in Computer Games on Lives of Children and Young People: Burhard Spinnen’s Novel “Nevena”. *International Journal of Social Science*. 56 Spring III, 177-200.
- 7-Kuşay, Y., Akbayır, Z. (2015) The Journey to Consumption by Digital Games: A Research on Child Consumers in terms of Learning Approach. *Akdeniz University Faculty of Communication Journal*. 23, 135-154.
- 8-Çakır, H. (2013).Taking the Opinions of Parents and Specifying the Effects on Students about Computer Games. *Mersin University Journal of the Faculty of Education*. 9(2), 130-150.



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- 9-Avcı, K., Avşar, Z. (2016). Digital Health Games. TRT Academy / Digital Media Issue 1(2), 472-486.
- 10-Çobener, A.A., Köksoy, S. (2014) The Use of Social Media in the Field of Health. Academic Informatics'14 – XVI. Academic Informatics Conference Proceedings. 899-906.
- 11-Kartal, M. (2010) Simulation-Based Medical Education. Marmara Medical Journal. 23(3), 38399.
- 12-Ricciardi, F., Paolis, L.T. (2014) A Comprehensive Review of SeriousGames in Health Professions. International Journal of Computer Games Technology. 1-12.
- 13-Kato, P.M. (2010) Video Games in Health Care: Closing the Gap. Review of General Psychology. 14(2), 113-121
- 14-Granic, I., Lobel, A., Rutger, C.M.E. (2014) The Benefits of Playing Video Games. American Psychologist. 69(1), 66-78.

Importance of Digital Games in Terms of Violence against Children

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Summary

A game is the real life of a child and the child acquires important competencies against the realities of life in this process. In this context, games are regarded as the irreplaceable and most effective sources of life for children. A child learns about the social rules during a game in an easiest and harmless way. Behaviors such as; awaiting his/her turn, haring, respecting others rights, protecting his/her rights and belongings respecting rules and limitations, obtaining order and sanitation habits, listening, expressing himself/herself are all learned during games. The digital world which provides a playing environment as a tool of a game is very popular at the present time. When the studies conducted on the impact of computer games on people and children, it can be seen that there are different approaches to positive and negative impacts. For the question of “Do children who fulfil their need of playing games via internet forget how to play a game?” many experts, including the informatics group, give the answer that indicates the shape of form of playing is changed instead of forgetting.

At this point, the innocence of traditional children games has given their place to industrialized games and toys. Computer games expose children to violence indirectly. Children have problems with their siblings while they are playing computer games or, the more interestingly, they desire to be the only child in the home. In this way, communication is distorted starting from family. There are studies that show the relationship between the level of the content watched via digital tools and aggression. In addition, in terms of addiction factor, the time of exposure also increases the tendency of aggression. It has been observed that with the increasing amount of blood on screen, the level of aggressive behavior also increase proportionally while empathy decreases. Particularly for the young children who cannot differentiate between concrete and abstract and learn through observation and imitation, the violence on media is very effective. It is also evident that children are exposed to role models who are not from the inner circle and be affected. Again, in many studies, it has been seen that the games that contain violence affect children’s and young people’s mental health negatively, reduce positive social behaviors and helpfulness, increase antagonistic emotions, make them desensitized against victims and cause the emergence of serious hyperactivity.

The most important difference that separates digital games from books and movies is the provision of interaction and enabling children to try. Another interaction factor is the interaction between players in multiplayer games. This interaction is not only limited by the virtual environment but it is also transferred to the social sphere and has



an impact on various behaviors of the child. This situation makes the child happy however when the child does this perpetually he/she learns to be happy only with that and cannot taste other happiness.

Children and young people have become the consumer subjects of the contents that may damage their nature and mental developments and they are loaded with messages that make them targets and actors of violence. It has been determined that children do not perceive if the game they play contains violence or not. It also draws the attention that the rules set by families about the computer playing on children are mostly related to the time and families do impose restrictions on type and content of computer games. In order to enable parents to be selective and supervisory on computer games their children play (appropriateness to age and level of development, whether it contains violence or not), their knowledge levels should be enhanced. However, most importantly, it will be beneficial to raise the awareness of children on this issue and provide them internal-control abilities. An informatics and media literacy course has been gaining importance in terms of social and personal perspectives. In addition, real playing opportunities can be provided for children by creating playing spaces. It is thought that children’s availability to use the right of playing games through traditional and digital games together will make a significant contribution both to child’s growth and development and to community health.

Key Words: Violence, Violence Against Child, Digital Games, Computer

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Introduction

Games are the most important area of the children. In this context, while there are many definitions in the literature, they are generally defined as natural learning process in which the children have discovery competence, enjoy and have fun. The children gain skills such as problem solving, discovery, thinking, reasoning, sharing, communicating, power, balance, coordination, self-organization, self-regulatory, rules-values and cultural production in the game process. Games are the real life of the children and they gain significant competences in real life throughout this process. In this context, games are accepted as the most effective and indispensable source of life for the children (1). Thanks to the games with universal expression, the children can overcome ethnic origin, language and other cultural differences. On the other hand, the children learn to discover their environment, imitate behavioral models and develop their existing skills. The children try to understand the world by playing games and they generally express anger, happiness, sadness expressions through games which are their natural communication language (2).

Digital games, programmed via various technologies and providing the users access user login with a visual environment and are also defined as games being a popular culture for the children manipulated in the context of the games presented. As the usage areas of the digital games increase and these games especially become an indispensable part of the children's daily life and as the outdoors playgrounds are limited, it is thought that this situation cause not only positive effects but also negative ones. In this context, it is thought that as the children have screen addiction raises and the time which they spend on digital games prolongs, they reduce communicating with their peers face to face and playing group games, instead they play alone more (1).

While tools such as computer and internet developmentally provide an appropriate and unlimited environment for children's and young people's learning, they may gain undesirable habits such as negative sexual information, violent behavior, consuming alcohol, smoking, gambling and unhealthy eating nutrition (3).

These games, programmed through various software and using different technologies are classified as digital console games, computer games and online games. The player can play games against artificial intelligence as single player or they can play against each other as multi players (4).

Digital Games and Violence

The games are perfect tools in terms of regulating children's emotions. This regulation function is clearly seen even in babies by means of social game behavior affecting relationship between parents and children. The children learn emotional reactions such as happiness, sorrow, pity, fear, anxiety, friendship, enmity, hatred, love, loving, being loved, confidence, dependence, independence and separation through games (4). In the study of Hazar et al. (4) which they compared traditional games and digital ones through metaphors, when the games were evaluated through "battle images" it was revealed that while "sport" metaphor came to the forefront for traditional games, "heroism and adventure" took center stage in digital ones. Computer games make individuals live in an imaginary world. These games offer them a world where they can do what they can't do in the real world and an opportunity to make real impossible figment of the imagination. They activate the emotions of the individuals and provoke excitement and curiosity. They make individuals feel sense of achievement and give them a chance to be able to dominate the game. There is no end in these games. It is necessary to win levels and this situation raises addiction to the game.

In the study of Kuşay and Akbayır, it was stated that the games with adventure, fear, war and excitement themes are more preferred in digital games. In addition to the visual appeal of computer games, adrenaline that the games create is one of the most important factors in creating digital game addiction. However, taking especially taking model tendency of child users into consideration, the negative affect of violence content should be noted. Again, in the same study, it was underlined that those playing digital games too much would like to establish stronger ties between the game and the real life.

It is possible to talk about a learning based on a habit on the children playing games too much. The children playing games too much express that they always choose the same things in the game. Therefore, those playing games continuously are thought to exhibit similar behaviors (5).

The digital games are replacing games played live day by day. While numerous games reshape child world by digitalizing it, function to relieve fatigue and stress as a leisure activity, they can also normalize violence by including violence elements. It was seen that the children playing digital strategic games at early ages tend to have more tendency to deal with "violence". It was pointed that these games may cause a conflict in children's inner world at the period when they start questioning reasoning and dampen their conscience and detach them from social life. The studies about violence content of the digital games started to be conducted in 1976. Although video games are fun, arousing curiosity and educational, many of them contain violence contents (2). Budak's study showed that children play mostly digital games with violence contents, their mothers was the participant group always repeating "games with violent content" concept and mothers expressed that their children got aggressive and they try to apply violence while solving a problem. Budak highlighted that this result was similar with the results of The Henry Kaiser Family Foundation (2002) which is about "Child and Video Games". The game types most preferred by children are war games (42%), sport games (41%) and adventure games (36%) (2).

The way the children and young people preferring not multi player but single player talk is getting rude and accordingly they have difficulty in understanding connections. The fact that including violence to the script of computer games increases the tendency towards violence. As the computer games including killing or being murdered figures, these games create more attraction towards children and young people. On the other hand, due to these games covering violence, when those lacking ability to differentiate real and virtual world want to do the same in real life, some psychosocial or psychic diseases revealed. In the computer game including violence, the player does an impersonation of an aggressive person by adapting himself to roles of figures. The long-term consequences of violence are erasing the feeling of pity and empathy of the player. Even if these moral values are tried to be controlled by judgments, emotional degeneration based on violence is increasing day by day. These kinds of results cause a problem for social development of the society. The games with violence content prevent children and young people from producing solutions towards conflicts. Disorders such as attention deficit, hyperactivity and fear also reveal depending on violence. The players never accept poor, weak, addicted, defeated and rotten roles, instead they accept positions rewarded (6).

In the study of Hazar (7) conducted with secondary school students, it was found that the students with high level of digital game addiction had also higher aggression levels. Akcayır (2013) expressed that excessive gaming led to psychological problems such as aggressive behaviors, personality impairments, mechanization, diminished emotions,



antisocial behaviors and impaired interpersonal relationships in the individual. Anderson (2001) concluded that games with violence content influence positively aggression behaviors of children and youngsters in his meta-analysis study about aggressive act, aggression understanding, physiological arousal, social behaviors of violent video games (7).

In the study of Yönet et al. (8), a significant difference was detected between TV watching time and aggression. In the same study, it was seen that aggression level of the students working out as refractive activity is low. When we take the influence of the media through television into consideration, it is seen that the media is more influential on the students than the parents in the globalizing world and that the family has taken over the function of determining attitudes and behaviors (8).

Here, crucial factors depend on the function of computer games, how much it has been played, what the children have adapted themselves from their social environment (Saglam, 2011) (Kiran, 2011) possible harmful influences of computer games and those covering violence on the children and young people are described as follows: Especially children and youngsters are much more affected by these games, they may reflect the behaviors of game characters in real life by modeling these characters. The fact that violence in game environments is painless makes it easier to practice in everyday life (9).

Kim and Sundar showed that as the screen growth increases, aggressive acts are seen more also. The violence in the media is much more influential especially for young children who cannot differentiate concrete and abstract concepts and learn through observation and imitation (10).

The most important difference that distinguishes computer games from books and films is that they allow interaction and experimentation opportunity. Thanks to the interaction feature, the decisions that the players make can change the course and result of the game. Therefore, each time the game is repeated, they can obtain different results and as a result of the decisions they made, they can interact with the computer by receiving feedback. Another interaction is that learners interact with each other in multi-player computer games. To achieve in the game, to win a competition creates superiority feeling in the children. The children like this situation and they feel happy. The reason for this is that their brains release happiness chemicals. On the other hand, when the children are continuously happy by doing this, they learn to be happy only this way, they cannot be happy otherwise. However, human brain may release happiness chemicals with other reasons also (11).

Conclusion

The study conducted by Burak and Ahmetoglu, it was seen that the children were not conscious whether the game they were playing contains violence or not. In the same study, 90.1% + of the students stated that their parents had rules about playing



computer games, but that the rules were related to the computer were more about the time period and that the families did not restrict the type and content of the computer games they played (12).

Violence against children is a social problem requiring early intervention and prevention in terms of both extend and results. Placing a good understanding of relationships between children and young adults is among the primary safeguards against violence. Individuals are encouraged to express themselves without applying violence but instead using problem-solving skills (13).

In order to enable parents to be selective and supervisory on computer games their children play (appropriateness to age and level of development, whether it contains violence or not), their knowledge levels should be enhanced. However, most importantly, it will be beneficial to raise the awareness of children on this issue and provide them internal-control abilities. An informatics and media literacy course has been gaining importance in terms of social and personal perspectives. In addition, real playing opportunities can be provided for children by creating playing spaces. It is thought that children’s availability to use the right of playing games through traditional and digital games together will make a significant contribution both to child’s growth and development and to community health.

References

- 1-Toran, M., Ulusoy, Z., Aydın, B., Devenci, T., Akbulut, A. (2016) Evaluation of Mothers’Views Regarding Children’s Use of Digital Game. *Kastamonu Education Journal*. 24(5), 2263-2278
- 2-Budak, O. (2017). Child Development to Digital Children's Games and Perspective of Preschool Teacher and Mothers, *The Journal of International Education Science*. 4(13), 158-172
- 3-Arnas, Y.A.,(2005) Evaluation of Interactive Tools Usage Habits of 3-18 Age Group, *The Turkish Online Journal of Educational Technology –TOJET*. 4(9) 59-66.
- 4-Hazar, Z., Demir, G.T., Dalkıran, H. (2017) Evaluation of Traditional Game and Digital Game Perception of Secondary School Students : Comparative Metaphor Study. *Spormetre*. 15(4), 179-190.
- 5-Kuşay, Y., Akbayır, Z. (2015) The Journey to Cosumption by Digital Games: A Research on Child Consumers in terms of Learning Approach *Journal of Akdeniz University Communication Faculty*. 23, 135-154.
- 6-Uysal, D. (2017) Effect of Addiction, Violence and Loss of Identity in Computer Games on Lives of Children and Young People: Burhard Spinnen’s Novel “Nevena International *Journal of Social Science*. 56 Spring III, 177-200.



7-Hazar, Z., Hazar, K., Gökyürek, B., Hazar, M., Çelikkbilek, S. (2017). Evaluation of Relationship among Play, Digital Game Addiction and Aggression Levels of Secondary School Students in terms of various variables. *International Journal of Human Sciences*. 14(4), 4320-4332.

8-Yönet, E., Çalık, F., Yaşartürk, F., Çimen, K. (2016). Study of High Schools Students' Participation to Recreative Activities and their Aggression-Violence Tendencies. *International Journal of Science Culture and Sport*. 4(1), 368-382.

9-Yörük, S., Koçyiğit, M., Turan, M. (2015) A Qualitative Research of Influence on Series, Movies and Computer Games on Secondary School Students' Perception, *Uşak University Journal Of Social Sciences* 8(4), 127-142.

10-Güngör, H., Ogelman, H.G., Sarıkaya, H.E., Körükçü, Ö. (2015). Preschool Children and Mobile Devices. *International Journal of Family Child and Education*. 6, 1-24.

11-Çakır, H. (2013). Taking the Opinions of Parents and Specifying the Effects on Students about Computer Games. *Mersin University Journal of the Faculty of Education*. 9(2), 130-150.

12-Burak, Y., Ahmetoğlu, E. (2015) Assessment of the Influence of Computer Games on the Aggressive Levels of Children, *International Periodical for the Languages, Literature and History of Turkish or Turkic*. 10(11), 363-382.

13-Bayat, M., Evgin, D. (2015) Violence Against Children. *Clinics in Turkey / Public Health Nurs-Special Topics*. 1(2), 30-36.

The Impact of Technology on Children

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Abstract

The interest in technological tools is increasing with the progress of the age. Internet is a worldwide communication network and the use of the Internet makes it attractive to people. The development of new software and the development of highly demanding computer games has attracted everyone's attention and increased the number of digital games. It is not clear yet how this increase will have consequences in the future. It is thought that technological tools, digital games and internet will have positive and negative effects on adult people and may have effects on children. Therefore, researches on the effects of technological tools such as computers, television, telephones, tablet PCs, digital games and the use of the Internet on children have been increasing. Families, educators, academics and psychologists have not yet come to a conclusion on the positive and negative effects of technology. It is important that children are interested in this digital technology and that they use this technology with their usefulness, despite the technological tools, digital games and the internet that point to the harms of children's interaction with technology at a young age. Children should be able to use technological tools and internet in a correct, efficient and efficient way and their safety should always be at the forefront. For this reason, it is necessary for parents, educators to give more importance to this issue, educators should be informed about the parents and also children should be educated and followed up about technological tools, digital games and internet usage. In this article, different definitions of technology are made. Then digital technology, digital game concepts are given. Students of the new millennium were identified. According to TUIK data, the ages of children's computer and Internet usage, mobile phone, computer, tablet PC, game console, computer and internet usage rates are mentioned. In another study, the rates of television watching hours of children were given. Digital vehicles, television, phone, computer and tablet PC tools can come to mind. The effects of television on children are mentioned and the health problems that may cause these effects on children are mentioned. The positive and negative effects of phone and tablet pcs on children are mentioned and the researches of experts on this subject are included. The emergence of the concept of digital games and the reasons for being preferred. Positive and negative aspects of the effects of computer games were discussed. Information about what causes these children to become addictive in children is given. Especially, how violent games affect the lives of children are the measures that can be taken. The purpose of the internet, which is a must for everyone, is explained. The benefits and harms of the Internet have been mentioned. Information was given about how children are affected physically and psychologically. The dangers on the Internet, the consequences of these dangers and how to protect them from these dangers are mentioned. It was stated that the duties of parents about the use of the mentioned technological tools are explained and the importance of knowing the purpose of their children using these technological tools. Parents are informed about these issues and they are given information about providing guidance to



their children. The results of the questionnaires about the opinions of the families about the digital games were shared. Educators were also informed about the technology to inform the children about digital games and the dangers of the internet. The results of the research conducted by preschool teachers are mentioned. In this article, which is mentioned about the effects of technology on children, it is thought that this subject is important for future generations and that illumination of parents and educators will be injured in informing the children. Especially educators have important duties in this regard.

Key words: Technology and children, digital games, effects of technology, internet and children

Introduction

Technology can be defined as a tool that we choose to organize our lives in general (Savcı, 1999). In other words, technologies simplify life, shorten distances and increase productivity, but in another dimension, technologies have control and ownership of individuals and societies by having human life (Inam, 1999). Term of digital meaning “electronic display of data on a given screen”. Digital technology can be defined as applications that electronically display, store and transmit information on a screen. In this context, computer, internet, mobile phones, cameras, video and web technologies are included in the digital technology in a wide variety of applications (TDK. 2014). To learn the language of digital tools, to learn by living, to do multiple operations, attention spans are short, the mind constantly from topic to topic, impatient in communication and relationships, instant return to the game, game-based living (and game-centered learning), fantasy world advanced, digitally social The characteristics of the new millennium depict the students of the new millennium, who are more advanced, physically mostly alone, preferring graphic elements to text items, preferring digital tools to paper-printed tools, and high education expectations (Pedró, F. 2006). According to TUIK's 2013 data; computer use is started at the age of eight years. The average age of using the mobile phone is ten. 24.4 percent of children now have their own computers. 13.1 percent of the smart phone or mobile phone, 2.9 percent of the game console. 60.5 percent of children use computers, 50.8 percent of them use internet and 24.3 percent of them use smart phones or mobile phones. Internet usage rate is 45.6 percent. 84.5 percent of children use internet for homework and learning, 79.5 percent for playing games, 50 percent for information and 53.5 percent for social networking. Children and young people use the computer and the Internet for different purposes such as play, listening music, writing, and studying (Li X, Atkins MS. 2008.) The use of the Internet has a number of risks especially for children and it should not be forgotten that these risks exist (Sahin, 2007). The technological developments in the world, the widespread use of internet technology and the use of computers in the home also changed the types of games played in the children and revealed the concept of DIGITAL GAME. DIGITAL GAMES have become much more preferred than traditional games due

to many factors such as ease of access, changing social and economic conditions and changing according family structure (Su, 2016.) In other words Digital game is programmed with various technologies and users can It is defined as games that become a popular culture for children who progressively manipulate within the framework of the game (Çetin, 2013; Flear, 2014). Especially in recent years, the use of digital games in the form of console games, PC games and online sub-genres has been increasing day by day between the children and young people (Gürcan, Özhan, Uslu, 2008.) In parallel with the widespread use of computer games the positive and negative effects of this situation on children and adolescents have been questioned (Ferguson, 2007). When computer games are not used consciously and correctly, they can produce negative results against the whole society, especially children and families. In addition, the increasing number of violent games in recent years have forced families to think about the negative effects of these games (Tarhan, 2007). The effect of television should not be forgotten. According to the research of Tuncer and Yalçın from Hacettepe; Turkey has to spend at least four hours a week across 31% of children's TV. This rate rises to 71.7% at the end of the week (Tuncer, Yalçın, 1999.) While the socialization of children and their interaction with their environment, opportunities to gain pre-schooling skills should be created, the fact that they spend most of their time in front of television can affect their development negatively (Can, 1995). As with these data, it is seen that the negative effects of digital instruments, digital games and internet have positive effects on children. The aim of this article is to examine the effects of technology on children and to explain what can be done against the negative effects of technology and what parents and educators can do.

Within the scope of this information, the questions of the study are as follows: For

- what purposes do children use technology?
- What are the positive aspects of digital tools, digital games and the Internet?
- What are the negative aspects of digital tools, digital games and the Internet?
- What can parents do about the digital tools, digital games and the purposeless and excessive use of the internet?

Digital tools, the effects of internet and digital games

Digital vehicles, television, phone, computer and tablet pc may come to mind.

Television

Children are not very selective and conscious about their developmental features and follow all the programs shown on the screen from advertisements to TV shows, competitions to news (Arnas and Erden, 2006). However, regardless of the program they follow, they are physically and mentally passive in the face of television. Thinking,

interrogating, interpreting can blunt such skills (Balaban 2002; Gulsen 2006). Television watching may have negative effects on aggression, sexuality, self-image, nutrition, narcotic, substance and abuse methods (Tuzun, 2002). Despite these negative effects, there are positive aspects of watching television. Encourages children to think. Extends the areas of interest and experience of children. Expands children's aesthetic tastes. Extends the child's vocabulary. Apart from these, sharing some positive attitudes and cooperating can be counted among the positive effects of television.

Phone and Tablet PC

It is stated that there are a lot of discomforts in children, especially neck and waist disorders due to tablet computers and smartphones. These tools can cause serious damage to the backbone of children of developmental age due to intensive use. According to experts, the world's youngest generation of waiting for the most important dangers, neck hernia and hunchback. Diseases such as neck, back, wrist and eye pain are seen in children between 5 and 9 years old at most. According to experts, the best treatment, limitation of children's use of tablets and smartphones. According to Dutch experts, the use of tablets and smartphones in children is "alarm" level. According to Peter Loon, orthopedic surgeon, the discomfort caused by the use of these devices, especially neck hernia and hunchback, is a serious problem. The physiotherapist, Maurice Blom, stated that the weight of the head was about 5 kilos, and that the weight was constantly down with the use of phones and tablets. Blom emphasizes that this sagging can lead to many chronic discomforts, particularly neck hernia and humpback (http://www.bbc.com/turkce/news/2016/03/160305_cocuklar_tablet_alarm).

Internet

Internet has become an indispensable part of our lives has become an indispensable position for our children. In particular, the Internet has benefited greatly in education, the children used to do homework. The aim of the children is mainly to do homework and find material for school projects. However, there are also those who make shopping (17%) and those who travel (50%) (Thomson, 1999). Children have access to new international information and new friends in new countries (Nilüfer Tuncer). Another benefit of the Internet is that it has an advantage for children with attention deficit hyperactivity disorder / learning disabilities. It is accepted that the Internet enriches learning (Tüzün, 2002).

The internet, which is so advantageous and beneficial, also brings with it a number of disadvantages and dangers for children. Easy access to illegal, violent and sexual sites, communication with dangerous people and extreme dependence on games are among the major risks. Those seeking support for illegal ways such as drugs and terror use the Internet as a propaganda tool. Research shows that many children are being deceived on the Internet and faced with abuse (MEB.). Children, including physical, psychological and social effects of the Internet, have many negative effects. Physical effects; children who are constantly on screen also have eye and body disorders. Children are less able to pour

their energies outdoors. Psychological effects; The child's psychosocial development is adversely affected by overuse of computers and the Internet. The interaction of school, family and friends, which are necessary for the development of the child in a complete state of well-being, is replaced by electronic friendship, which in turn affects the ability to establish and maintain interpersonal relationships. There is a linear relationship between problematic internet use and depression, social isolation, loneliness and decrease in home / school / job performance (Caplan, 2002). In addition to internet addiction in children, it is risky to enter harmful sites as a result of uncontrolled use and to be affected psychologically (Muslu, Bolşık, 2009). The child who visits the internet in an uncontrolled way can face the sites of pornography, violence and bad habits. These sites can cause serious problems especially for young children (The effects of television and internet on family interaction. Çanakkale Guidance and Research Center). Violent programs can lead to the development of aggressive personality in children, as well as an increase in emotions such as insensitivity and fear towards violence (Shields, Behrman, 2000). Cognitive effects; Because of their characteristics in their mental processes, children cannot perceive what they see as adults and are affected differently from adults. Children cannot perceive the difference between fiction and reality as easily as adults. Therefore, it cannot distinguish between the real world and the world on the Internet. This may cause children to exhibit behavioral features that can be harmed (Subrahmanyam, Smahel, Greenfield, 2000).

Digital games

Internet use and computer games are a current issue that has a significant impact on the daily life, academic achievement and mental health of children and young people, and attracts the attention of researchers. (Kelleci, 2008). In children, some think about whether computer games have an impact or not that computer games have little or no effect on the child's negative behaviors and some think that they are not positive in terms of education. In addition, some studies have shown that children play addictive behavior towards computer games while playing computer games. However, according to these studies, people classified as dependent personality have been found to be very successful and highly intelligent in other areas of their lives (Haris, 2001).

General Director of Prime Ministry Family and Social Research Aysen Gürcan stated that digital games increase the level of motivation of the student and that they provide self-confidence and self-confidence about learning and they will be motivated to learn and these games draw attention to the fact that children can create confusion in their inner world, blunt the sense of conscience, and affect inter-family relations in terms of interaction and communication. According to Gürcan, the rich communication facilities provided by the virtual environment eliminate the time and space limitation, play a game of children online with more than one person, create a character, reach the highest level with various abilities and powers, create a sense of money and continuous success. . Gürcan also assimilates violent computer games, maintains this in real life, and solves the problems in the virtual world with one-touch, while solving problems in real life and

turning violent, it becomes aggressive (Gürcan, 2008). Children who play strategic games at a young age tend to have more stratejik violence tendencies.

Especially in the period when the strategic games begin to question the power of reasoning in children, it can be said that the award can be a factor that triggers addiction in children at the point where it can create confusion in the inner world, blunt the sense of conscience and break the sense of winning from social life (Gürcan, Özhan, Uslu, 2008). Computer games have some negative effects on children. These; After playing games that make aggression, they show physical aggression to their surroundings, decrease empathy in children, cause them to become more vulnerable individuals, reduce sensitivity to violent behavior, reduce academic performance, create computer addiction, escape from school, and even steal for computer games sitting in the house increases the likelihood of an irregular diet, ie obesity (Media Development Authority, 2012). In addition, some scientific studies show that playing computer games puts them at a number of physical risks that increase the rate of extortion, confiscation and heart attack on children. For example, playing computer games may even cause epileptic paralysis in smokers. Repeated flashing images in some computer games negatively affect patients with photosensitive (light-sensitive) epilepsy (Subrahmanyam, Kraut, Greenfield, 2000). Playing computer games at the level of addicts results such as students cannot stop playing games, associate the game with their real life, disrupt their duties due to playing the game and prefer to play games for other activities. It is thought that these conditions will negatively affect the socialization and academic success of the child (Horzum, 2011).

Computer games have some positive effects besides the negative effects on children. These; it encourages potential creativity, provides the social space of entertainment and entertainment, provides children with a sound approach to technology, increases their self-confidence and dignity, develops skills in reading and solving mathematical problems, enhances supportive-social behaviors such as helping and sharing, eye-hand coordination and visual increases spatial ability, facilitates language development in autistic children and provides play therapy for timid children (Media Development Authority, 2012). Many child development experts claim that playing time is especially beneficial for children's intelligence and development. According to the results of the researches made by experts today, only the creative and children's imagination that develops the children's intelligence accelerates the development of children ([http:// tiport.com/cocuklar-en-cok-hangi-oyunlari-tercihediyor1187.html](http://tiport.com/cocuklar-en-cok-hangi-oyunlari-tercihediyor1187.html)). Murat Güvener says “Computer games improve the mind”. In addition, because the computer does not have the same kind of stimulants on the computer, the child does not stay in a vicious circle, children solve a lot of problems while playing, both develop their intelligence and enrich their imagination en (cited by Akyay, www.caginpulisi.com. -7.htm). Specialist Psychologist Nilüfer Eyüpoğlu stated that despite the fact that children were passive in front of the television, they kept their creativity on the computer and they were active success to (video) games. According to her, animation, sound and unification of various surprises stimulate the emotional part of the brain, thus developing computer games,

mental functions and helping children learn the internal mechanisms of life (citing Akyay, www.Caginpolisi.com.tr/32/5-6-7). .htm). Video games are interactive games where the child has to practice continuously to be the best. Children return to the game again and again because it gives them a sense of success. Moreover, playing video games helps children to develop their perception, cognition and motion skills (, Karthawww.buzzle.com).

Methods of Protecting Families and Children by Families and Educators

Especially if we don't properly educate and guide children about computer use, they may be a very dangerous weapon for them. The necessary measures can be taken to ensure the protection of children and young people's personality and spiritual structures. In this sense, computer usage periods should be intervened when necessary, which programs or games installed on their computers should be controlled, the location of the computer at home should be easy to control (Kiran, 2011).

In particular, young children should not be left alone as much as possible while watching television or playing on the computer. Experts say that children can spend up to two hours a day on a computer. As this period increases, the losses increase (Tarhan, 2007). Moreover, due to the fact that computer working environments are ergonomically designed for adults, increasing the playing time of children of this age group may affect children's health more than adults. Therefore; Instead of playing computer games in order to support physical development, it is important for families to spend quality time with their children by doing alternative physical activities (reading books, going to the park, playing games etc.) (Akçay, Özcebe, 2012).

To protect children and young people from using computer to prevent the negative effects of computer games may be the first thought that many families may be the first measure. But the prohibition will never bring a permanent solution to this problem. In such measures, children and young people may choose not to impose bans when they cannot be controlled by their parents, or they may seek to obtain these opportunities outside the home. Therefore, families should be in close contact with their children and provide an easy communication environment with their children so that they can use the computer in a positive way (Kiran, 2011). Considering the fact that children who may be thought to be in the game age can affect the next periods of playing computer games, it is important to gain the habit of playing appropriately in a controlled manner by families (Horzum, 2011). Children should have a sense of responsibility. If a responsible child plays more than necessary games, he / she feels restless. The error of the families, the child is fully immersed in the computer playing "Come on, study," the child is an enemy of the class. Parents must say " your time is running out you have 10 minutes to finish it" after 10 minutes you must study(Tarhan, 2007). Otherwise, children will be in conflict with their families and their relationship will deteriorate. Correcting a broken relationship can be difficult.

Families should guide their children to play a computer game. For example; It should be noted that young children should not have violence and sexuality in the elections; Especially when they play a new game, they should play with the children. The computer should be placed in a public place, such as a living room, and what children play on the screen should be followed. Computer contents should be discussed with children. A definite speech should be made about why they will not play the objectionable games with children. Children should be warned in a way that they can understand, not to be hurt. They should be checked at the beginning of the game (Media Development Authority, 2012). Families should obtain information about the games and determine the content of their child's computer game. Parents can choose educational educational software based on play method in order to teach their children basic concepts (Akçay, Özcebe, 2012). Computer games can serve as a pedagogical software as an educational software material with their potential (İnal, Kiraz, 2008). Here, it is important for families to have experience in software selection and selected software content and to get support from a specialist. In fact, the most important measure is to trust and talk with the child. We can teach children to be selective and help them. Educators should also provide information about technological tools to children. He / she should teach ways to use the Internet harmlessly and warn of the dangers.

Result

Children use the computer at home in an average of 18 minutes, 7 minutes to use the internet, 14 min to computer games. and video games 10 min. time (Arnas, Erden, 2006.). In a poll conducted by Hüseyin Çakır, 8.8% of the families stated that their child started playing computer games at the age of 0-5, 66.5% started between 5-10 years old and 24.7% between 10-15 years old. . It is seen that most of the children of the surveyed families started playing computer games at an early age.

In another poll of Çakır, 6% of the families did not use any computer in their children's average computer usage per day, 75.8% in 1-2 hours, 15.3% in 3-5 hours, 2.8% in 6 hours and above. 9.8% of the participants do not play computer games in their children's average computer games per day, 76.3% in 1-2 hours, 13.0% in 3-5 hours, 0.9% in 6 hours and as stated above. In another study of Çakır, how does your child play a computer game? According to the opinions about; 53.5% of the families stated that computer games were in the way of preventing the child from studying, 14.0% of them were unstable, 32.5% of them did not attend. 47.4% of the participants agree that the social activities of the computer games will be prevented by the children, 15.3% of them are undecided and 37.3% of them do not agree.

20,0% of the families agree that the computer games cause the child to learn to enjoy the suffering and death of others, 12.6% of whom are undecided, 67.4% of them disagree. 45.6% of the families agree that the computer games contribute to the knowledge and skills of the child, 19.5% undecided, 34.9% disagree (Çakır, 2000.)

In a study conducted by preschool teachers 48- It was determined that 59% of children used 52% of their children and 73.1% of children between 60-72 months.

Conclusion:

As can be seen, there is no definite opinion about the effects of television, phone, tablet, computer, internet and computer games on children. Some people have positive results compared to others but some of them have negative consequences. It is seen that the age of use of technology has fallen day by day. Despite the opinions that indicate the harm of computer, internet and video games to the interaction of technology with children at a young age, the interest in digital technology is at least beneficial for their futures; control is seen as a kind of antidote. Parents and educators have a major role in the use of technology for children. Parents and educators are knowledgeable and sensitive about these subjects, and children can use technology more efficiently and harmlessly.

References

İlkay Savcı A.Ü. Siyasal Bilgiler Fakültesi Toplumsal Cinsiyet ve Teknoloji Ankara Üniversitesi SBF Dergisi. 54-1

İnam, A. (1999). Teknoloji Benim Neyim Oluyor? Ankara: ODTÜ Geliştirme Vakfı Yayıncılık ve İletişim A.Ş. Yayınları.

([http:// www.tuik.gov.tr](http://www.tuik.gov.tr)).

Li X, Atkins MS. Early childhood computer experience and cognitive and motor development. Pediatrics. 2004; 113: 1715–1722.

Şahin, F. (2007). İnternet ve çocuk istismarı. Sosyal Pediatri Günleri "Basın Yayında Çocuk Sağlığı Sempozyumu",

SU, G. (2016) çocuklar neden cep telefonunu elden dusurmuyor? Tek suclu onlar mi/

Çetin, E. (2013). Temel tanımlar ve kavramlar. Mehmet Akif Ocak (Ed.), Eğitsel dijital oyunlar kuram, tasarım ve uygulama içinde (s. 2-6). Ankara: Pegem.

Fleer, M. (2014). The demands and motives afforded through digital play in early childhood activity settings. Learning, Culture and Social Interaction, 3(3):202-209.

TDK. (2014). Büyük Türkçe Sözlük. Türk Dil Kurumu.

Pedró, F. (2006). The New Millennium Learners:Challenging Our Views On Ict And Learning



Gürcan A, Özhan S, Uslu R. Dijital oyunlar ve çocuklar üzerindeki etkileri. Başbakanlık Aile ve Sosyal Araştırmalar Genel Müdürlüğü, Ankara, 2008:1-50.

Ferguson CJ. The good, The Bad and The Ugly: A Meta-analytic Review of Positive and Negative Effects of Violent Video Games. *Psychiatr Q* 2007;78:309-16.

Tarhan, N. (2007). Çocuklar Bilgisayar Oyunlarından Etkilenir mi?. Sayı : 19. Özel Sayı 1. Tefekkür Dergisi.

Tuncer AM, Yalçı n SS: Multimedia and children in Turkey, *Türk J Pediatr* 41:27-34, 1999.

Can, A. (1995). Okul öncesi çocuklara yönelik televizyon programları içinde çizgi filmlerin çocukların gelişimine ve iletişimine yönelik etkileri.

Arnas, Y.A.,Erden, S.(2006). “Çizgi Filmlerdeki Şiddet Unsurlarının İncelenmesi”, M.Ü. Atatürk Eğitim Fakültesi 1. Uluslararası Okul Öncesi Eğitim kongresi bildiri Kitabı.İstanbul:Ya-Pa Yayınları.

Balaban A. (2002) Televizyon Çocuk Programlarının Kalite Kriterlerine İlişkin Olarak Okul Öncesi Kurumlarına Devam Eden Çocukların Anne Babalarının Görüşleri. Yüksek Lisans Tezi, Marmara Üniversitesi eğitim Bilimleri Enstitüsü, İstanbul.

Gülşen, S. (2006). Okul Öncesi Çocuklarının Televizyon İzleme Alışkanlıklarının Bazı Değişkenlere Göre İncelenmesi. Yüksek Lisans Tezi, Fırat Üniversitesi Sosyal Bilimler Enstitüsü, Elazığ.

Tüzün, Ü. Gelişen İletişim Araçlarının Çocuk ve Gençlerin Etkileşimi Üzerine Etkisi

http://www.bbc.com/turkce/haberler/2016/03/160305_cocuklar_tablet_alarm.

Thomson, Bill.(1999).”New kiad on the net”,The Guardinan, June 24.

Tuncer, N. (1999). Çocuk ve internet kullanımı

<http://okulweb.meb.gov.tr/35/02/959733>

Caplan SE. Problematic İnternet use andpsychosocial well-being: Development of a theory-based cognitive–behavioral measurement instrument. *Computers in Human Behavior*. 2002; 18: 553–575.

Muslu, G., Bolışık, B. “Çocuk ve Gençlerde İnternet Kullanımı”

Televizyon ve internetin aile içi etkileşime etkileri. Çanakkale Rehberlik ve Araştırma Merkezi

Shields MK, Behrman RE. Children and computer technology: Analysis and recommendations. *The Future of Children*. 2000; 10(2): 4–30.

Subrahmanyam K, Smahel D, Greenfield P. Connecting developmental constructions to the Internet: Identity presentation and sexual exploration in online teen chat rooms. *Developmental Psychology*. 2006; 42: 395–406.

Kelleci, M. (2008). İnternet, Cep Telefonu, Bilgisayar Oyunlarının Çocuk Ve Gençlerin Ruh Sağlığına Etkileri. *TAF Preventive Medicine Bulletin*, 7(3):253-256.

Haris, J. (2001). “The effects of computer games on young children”, Home Office Research, Development and Statistics Directorate Communications Development Unit, London, 7-14

www.radikal.com.tr/Radikal.aspx?aType=RadikalDe-

Horzum, M. B. (2011). İlköğretim Öğrencilerinin Bilgisayar Oyunu Bağımlılık Düzeylerinin Çeşitli Değişkenlere Göre İncelenmesi. *Eğitim ve Bilim*, 36(159).

Media Development Authority, (2012).

Subrahmanyam, K., Kraut, R. E., Greenfield, P. M. Gross, E.F.(2000). The Impact of Home Computer Use on Children’s Activities and Development. Publication: *The Future of Children. Children and Computer Tecnology*,(2): 123–140.

<http://tiport.com/cocuklar-en-cok-hangi-oyunla-ri-tercih-ediyor-1187.html>, erişim tarihi: 24.03. 2010.

aktaran Akyay, www.caginpulisi.com.tr/32/5-6-7.htm).

Kartha, www.buzzle.com

Aktaş Arnas YY. 3-18 yaş grubu çocuk ve gençlerin interaktif iletişim araçlarını kullanma alışkanlıklarının değerlendirilmesi. *TOJET* 2005;4(4):1303-6521.

Çakır, H. “Bilgisayar Oyunlarına İlişkin Ailelerin Görüşleri ve Öğrenci Üzerindeki Etkilerin Belirlenmesi”

Akçay, D., Özcebe, (2012). H. Okul Öncesi Eğitim Alan Çocukların ve Ailelerinin Bilgisayar Oyunu Oynama Alışkanlıklarının Değerlendirilmesi. *Çocuk Dergisi* 12(2):66-71.

Kıran, Ö. (2011). Şiddet İçeren Bilgisayar Oyunlarının Ortaöğretim Gençliği Üzerindeki Etkileri (Samsun Örneği). Samsun Sempozyumu

Determination and Decomposition of Bad Comments on Dijital Game Web Sites by Naive Bayes Classification Method

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Abstract

Digital gaming and virtual platforms on the internet environment have risks and sorts of negative consequences that cause worrying situations when the real life is reflected and encountered. Many of the children spend a large part of their time on game sites and mobile platforms that offer a rich stimulus environment. Unfortunately, we are witnessing every day that this kind of environment continues to adversely affect children's negative events. Risks arising from such platforms are directly reflected in the real lives of children, in their communicative tongues, in the world of emotions and thoughts. Many internet service provider and some of the various platforms offering options such as "Child or Family Profiles" under the name of "Secure Internet Service". However, it is known as a secure environment, and for this reason, it is possible to use the services such as YouTube, facebook, etc. which are used by all ages, social network platforms have different drawbacks. The sharing of the records of the games previously played in these environments and the slang expressions in the comment sections of these exchanges are seen in the studies conducted in which the children reflect negatively on their communicative languages and their thought worlds. However, there are some web sites that offer online games especially for children. These sites provide an environment in which children can comment and share ideas about the game. Nevertheless, when examining the comments/expressions found in these environments, unfortunately it seems that, insults, bad words, humiliation and slang content are involved in word, sentence and instant sharing. It has been found that access to these sites with bad comments can be easily achieved, even when access is made from child professions under the name of secure internet service provided by Internet service providers. Although it has been interfered with by moderators and web site administrators using various methods (blacklist) or manually. This problem is still remains as a problem because of the new produced words instead of filtered fixed words, this situation is a challenge in our daily life and especially affecting our children negatively. In this research, it is aimed to develop a "bad comment filtering and parsing software" which will autonomously work on this problem which adversely affects the cognitive and emotional development of children and which will work autonomously by naive bayes method.

Keywords: Autonomic Filtering in Digital Games, Bad Comment Filtering, Machine Learning



Introduction

For adults as well as for children a great entertainment, communication and educational resource access to and use of the digital games every day is rapidly spreading. With the especially online games children discovering the world, learning and is an excellent place to have fun. However, the use of dijital games have a number of observed risks for children and the existence of these risks It should be noted.

The negative situations that children and young people are exposed to have necessitated various importance in the on-line environment [1]. However, game sites with content that can harm children and young people are also quite large. It would be ineffective and inaccurate to ban children from using the games because of the possible dangers of the dijital games. Because it can be used also educational purposes. It is of great importance for parents to guide their children on the internet by becoming aware of the dangers that are waiting for themselves and their children.

In this study, it is aimed to develop a "bad comment filtering and parsing software" which will autonomously work on this problem which adversely affects the cognitive and emotional development of children and which will work autonomously with the ability of learning / interpreting the possibility of autonomous filtering and more important.

The study bases on machine learning system, which is a subdivision of artificial intelligence's digital learning and model recognition studies. Machine learning provides automatic recognition of meaningful patterns in the data. It has been used in data mining applications from large data sets is necessary. Nowadays, machine learning has been developed with learning methods such as search engines, anti-spam e-mail filters, virtual assistants and so on. are being designed [3].

Method And Application

Naive Bayes classification algorithm, which is also used in machine learning studies in our research, is integrated into the system and encoded in the Python program language. The BeatifulSoup library of Python language is used to process HTML and XML files, which are formatted comments on game sites. The data set was trained by using the Multiominal Naive Bayes algorithm found in the Scikit-Learn library by creating a data set that contains good comments and bad comments.

The classification of comments to be made later by this step is classified according to the sentence in the list. Software created on this way and it was used to detect and interpret bad comments for use on platforms with such bad comments. With the system which is created, have a autonomous filtering and a machine learning process was performed to determine if the first-used expressions could be bad comments. It is foreseen that

children who spend their hours on game sites will be provided with safe internet service by preventing and using negative expressions and sentences containing bad comments.

Data Set: The data set used in the study consists of comments shared in game and video sharing sites. The HTML and XML formats used for comments were created using the BeautifulSoup library in the Python programming language.

Naive Bayes Algorithm: The Naive Bayes classification algorithm, which is also used in machine learning studies in our research, is integrated into the system and encoded in the Python program language. Naive Bayes classifiers are a family of classifiers based on the popular Bayesian probability theory and are used to create simple yet well performing models in document classification and disease prediction areas [2], [5].

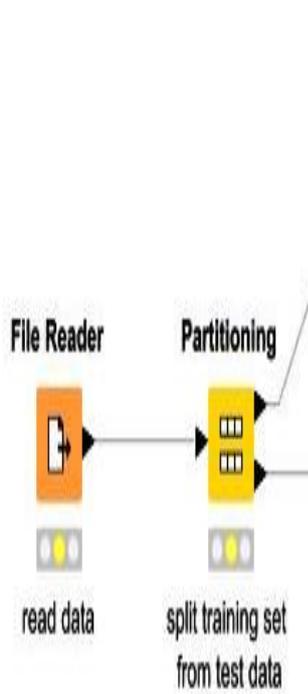


FIGURE 1:

Multinomial Naive Bayes: Multinomial Naive Bayes was used in the study. While MNB classifies text documents, it uses a variant called frequency domain($tf(t,d)$) [4], [6].

normalized term frequen

FIGURE 2

- **tf (t,d):** Crude standard frequency
- **nd :** Total number of terms in the dd document

$$\hat{P}(x_i | \omega_j) = \frac{\sum tf(x_i)}{\sum N_{d \in \omega_j}}$$

FIGURE 3

- **xi:** The word from a particular instance x property vector
- **tf:** In the case of training, the sum of the frequencies of
- the raw terms of the xi term from all documents
- belonging to ω_j class
- **N :** Sum of all frequencies in the training data set for class
- **wj:** Additive smoothing parameter
- **V:** Size of vocabulary

After the data set was created, the data set as trained using the MNB algorithm in the Scikit-Learn library.

```
def __train(self):
    self.vect = TfidfVectorizer(min_df=1)
    self.frame_x, self.frame_y = self._dataFrame()
    self.x_train, self.x_test, self.y_train, self.y_test = train_test_split(self.frame_x, self.frame_y, test_size=0.2, random_state=1)
    self.x_trainvect = self.vect.fit_transform(self.x_train) # öğrettığımız yer

def __NaiveBayes(self):
    self.__train()
    self.mnb = MultinomialNB()
    self.y_train = self.y_train.astype('int')
    self.mnb.fit(self.x_trainvect, self.y_train)

def test(self, sentence):
    self.__NaiveBayes()
    x_testvect = self.vect.transform([sentence])
    pred = self.mnb.predict(x_testvect)
    if pred[0] <= self.badLenght:
        return "Bad comment"
    else:
        return "Good comment"
```

FIGURE 4

The Process And Design Diagram

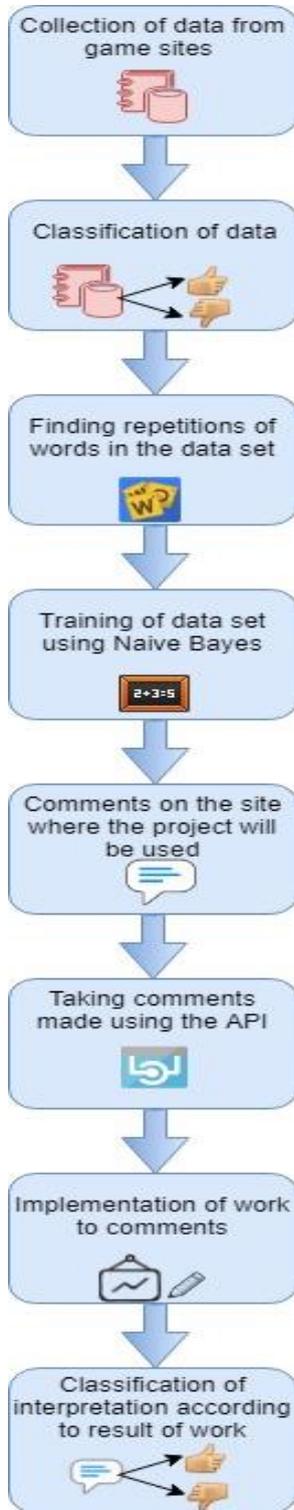


FIGURE 5

Results

Created software in python programming language was used to detect and interpret bad comments for using platforms with bad comments. It is foreseen that children who spend their hours on game sites will be provided with safe internet service by preventing and using negative expressions and sentences containing bad comments.

In this study a bad comment filtering and parsing software was created for dijital game platforms which is autonomously working based on machine learning. This software has benefits the cognitive and emotional development of children and which will work autonomously by naive bayes method.

References

- [1] Çelen, F. K., Çelik, A., & Seferoğlu, S. S. (2011). Çocukların internet kullanımları ve onları bekleyen çevrim-içi riskler. *Akademik Bilişim*, 2-4.
- [2] Kazmierska, J., & Malicki, J. (2008). Application of the Naïve Bayesian Classifier to optimize treatment decisions. *Radiotherapy and Oncology*, 86(2), 211-216.
- [3] Li, T., Li, J., Liu, Z., Li, P., & Jia, C. (2018). Differentially private naive bayes learning over multiple data sources. *Information Sciences*, 444, 89-104.
- [4] Raschka, S. (2014). Naive bayes and text classification i-introduction and theory. *arXiv preprint arXiv:1410.5329*.
- [5] Rish, I. (2001, August). An empirical study of the naive Bayes classifier. In *IJCAI 2001 workshop on empirical methods in artificial intelligence* (Vol. 3, No. 22, pp. 41-46). New York: IBM.
- [6] Zhang, H. (2004). The optimality of naive Bayes. *AA*, 1(2), 3.



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