

Metaphorical Perceptions of Middle School Students Regarding Computer Games

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Abstract—The computer, among the most important inventions of the twentieth century, has become an increasingly important component in our everyday lives. Computer games also have become increasingly popular among people day-by-day, owing to their features based on realistic virtual environments, audio and visual features, and the roles they offer players. In the present study, the metaphors students have for computer games are investigated, as well as an effort to fill the gap in the literature. Students were asked to complete the sentence—‘Computer game is like/similar to....because....’—to determine the middle school students’ metaphorical images of the concept for ‘computer game’. The metaphors created by the students were grouped in six categories, based on the source of the metaphor. These categories were ordered as ‘computer game as a means of entertainment’, ‘computer game as a beneficial means’, ‘computer game as a basic need’, ‘computer game as a source of evil’, ‘computer game as a means of withdrawal’, and ‘computer game as a source of addiction’, according to the number of metaphors they included.

Keywords—Computer game, metaphor, middle school students.

I. INTRODUCTION

TODAY’S technological developments have led to the emergence of tools, which make life easier and have become a permanent part of our lives [1]. The computer, among the most important inventions of the twentieth century, has become an increasingly important component in our everyday lives. With globalization of technology, the computer has assumed an important place in the lives of not only adults, but also children [2]. Nowadays, computers are frequently used in the areas of trade, architecture, medicine, literature and various fields of engineering, to name a few [3]. Whenever entertainment in virtual environments is mentioned, it is quite difficult to distinguish among the trilogy of the computer, Internet, and games [1]. Kirriemuir [4] states the phrases ‘video game’ and ‘computer game’ can be used interchangeably, due to the existence of a screen through which the game is viewed and the data input is maintained through devices, such as a joystick or a keyboard. Today, playing games has become a highly preferred activity among children and adolescents as entertainment and recreation. Computer games have become increasingly popular among people day-by-day, owing to their features based on realistic

virtual environments, audio and visual features, and the roles they offer players [5].

In addition to the entertainment sector, games are also used in the business world for issues, such as employee training. Additionally, simulation-based games are used in the areas of health and military [4]. Throughout the past 30 years, computer games have become a huge industry generating an annual revenue of 20 million Turkish Liras [1], [4]. A review of the literature shows certain studies have investigated the reason for this prevalence of computer games. In these studies, the reasons for the demand to play computer games include pass time, interest, and desire for excitement [6], relax or avoid stress [7]-[9], entertainment, challenge, and lack of something to do [10], the opportunity to return to the same game, and provide a medium that engages people for long periods of time [4].

Computers and computer games provide both positive and negative effects on children and adolescents. These effects can be both beneficial and harmful, depending on when and for how long they are played [11], [12]. Computer games can highly contribute to the development of hand-eye coordination and help improve manual skills, especially during the preschool period. Hyperactive children, who find it difficult to concentrate their attention, can sit in front of an attractive program for a longer time. For these reasons, computer usage can provide educational support through helping the child focus attention on a specific task. Children can reinforce various concepts they learn in everyday life and during their education through computer games. Applications in computer games, which require making quick decisions, could contribute to the development of children’s problem-solving skills [3].

Computer games are regarded as an ideal way to help children acquire computer literacy skills and obtain the knowledge they need [13], [14]. Prensky [15] states computer games could create a new learning culture and this would better correspond with students’ habits and interests. Besides the aforementioned positive effects, computer games may also have negative effects, especially for children and adolescents. Spending excessive time playing computer games may cause certain discipline problems in a child or adult, such harmful social relationships, school or work life disruptions, and caught in an addiction cycle [16].

Studies conducted on computer game addiction show an extreme use of games might cause obsessive and aggressive behaviors, mechanization and tendency towards violence, changes in personality, decrease in feelings, hyperactivity, learning disorders, early-maturing of children, psychomotor

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disorders, health problems due to lack of mobility, antisocial behaviors, loss of free thought and desire, tendency to quarrel with friends, increase in hostile behavior, decrease in academic success, increase in the level of anxiety, deterioration of interpersonal relationships, avoidance of reality and life, immature human relationships, confusion between fantasy and reality, and loss of sensation [1], [17]-[20]. Cooper and Mackie [21] state that computer games, especially those played at cafes, include excessive violence and aggression, and turn from an exciting game into a mentality that perceives rivalry as 'destroying one another' and 'exterminating the others' [11]. According to these researchers, children, especially, learn the aggressive behaviors they watch in the games through modelling and imitation. Consequently, computer games lead to the adoption and prevalence of aggressive behaviors.

In summary, the related literature shows computer games can have both positive and negative effects on children and adolescents. Therefore, it necessary to understand the concept of computer games that exist in children's minds. A review of previous research shows no metaphor studies have been conducted about computer games with middle school students. In the present study, the metaphors students have for computer games are investigated, as well as an effort to fill the gap in the literature. The purpose of using metaphors is to reveal the students' mental images of computer games and to better understand the outcomes of the limited and excessive use of such games.

II. METHOD

The present study was conducted using phenomenology—a qualitative research design. Phenomenology design provides a suitable basis for studies aiming to investigate the phenomena we are aware, but cannot completely understand [22]. In this study, phenomenology was used to investigate the phenomena middle school students pointed out regarding computer games.

A. Participant

A total of 487 students, attending two middle schools in Beysehir district of Konya province, participated in the present study (Table I). The study was conducted November 2012.

TABLE I
RATE AND FREQUENCY DISTRIBUTION OF PARTICIPANTS, ACCORDING TO GENDER AND GRADE

Variable	Choice	f	%
Gender	Female	231	47.4
	Male	256	52.6
	5	71	14.6
Grade	6	188	38.6
	7	94	19.3
	8	134	27.5

B. Data Collection

Students were asked to complete the sentence—'Computer game is like/similar to...because...'— to determine the middle school students' metaphorical images of the concept for 'computer game'. Participants were provided a blank sheet

or paper with only this statement, asked to focus on a single metaphor, and write their ideas using the statement. At the beginning, students were provided with necessary explanations about the concept of a metaphor. It was especially emphasized several times that students had to define 'computer game' in some way. Saban [23], in studies, which use metaphor as a research tool, the term 'is like' is utilized to reveal the connection between the subject and the source of the metaphor. The term 'because' is used to help participants present a logical basis or reason for their metaphorical definitions. The students were given 20 minutes to express the metaphors. The metaphors created from the statement 'Computer game is like/similar to....because....' constituted the main data source of this study.

C. Data Analysis

Content analysis was used as a technique to analyse the data collected in this study. The basic goal for content analysis is to reach an accurate representation of the collected information. The basic procedure for content analysis is to collect corresponding information within the scope of a certain idea and topic, and to determine a method that will enable the reader to understand this idea and topic [22].

The analysis process and the process students understood metaphors follow. First, the metaphors created by students were temporarily arranged according to alphabetical order. During this arranging stage, it was checked to determine whether the students clearly indicated the metaphor. Three types of data sheets were eliminated. All empty sheets were eliminated. It was found some students shared their ideas on computer games, rather than indicating a metaphor. Additionally, although some students stated a metaphor, they did not provide an acceptable logical ground. Based on these reasons, 160 sheets were eliminated and 327 sheets were selected for evaluation.

Second, the valid metaphors created by the students were reviewed and arranged in alphabetical order. Afterwards, sample metaphor expressions, which represented each metaphor, were selected. The aim for this selection was to facilitate the grouping of metaphors into categories and to enable the interpretation of the data. Following the selection of sample metaphors, the acceptable metaphors were grouped according to their similarities. The categories were developed according to the metaphors grouped with regard to the characteristics of the perception of computer games. The metaphors created by 327 students were divided into six groups.

Third, the validity and reliability of the study were determined. Validity and reliability are two important criteria to assure the quality of the study's results. In a well-performed study, the detailed report of the information and how the researchers obtained the presented results are important criteria for validity [22]. The data collection and analysis processes were explained in detail to establish the validity of the present study. Furthermore, the information obtained from this study was supported with the statements written by the students. To ensure reliability of the study, the obtained

information was analyzed by the researchers. Afterwards, the researchers assembled to compare the results of their analyses. Concurrently, a different expert performed an analysis to determine whether the metaphors for the study's specific category represented that category. In this regard, the lists of the metaphors created by the students and the categories developed by the researchers were presented to the expert. The expert was asked to write the metaphors in the related category. Next, the groups created by the expert and the researchers were compared. The reliability for this study was determined, based on the number of agreements and disagreements obtained from the comparisons. Reliability was calculated by using the formula suggested by [24]. $\text{Reliability} = \frac{\text{Number of agreements}}{(\text{total number of agreements} + \text{disagreements})}$. Using this calculation, the reliability for the study was determined 95%. The expert placed four metaphors (cauliflower, seed, hourglass, battery) into groups different from those formed by the researchers. Thus, reliability was calculated as $\frac{75}{79(75+4)} = 0.95$. According to Saban [24], the desired reliability must be at least 90 % [24]; cited in [23]

Following this procedure, the value (f) and the percentages (%) of the participants regarding the 79 metaphors and six categories were calculated.

III. FINDINGS

The students, who participated in this study, created 79 valid metaphors about 'computer game'. Of the 79 metaphors, 29 were created by a single student. The number of students who created the remaining 50 metaphors varied between 2 and 38. Of the 79 metaphors, the students associated nine with human beings, five with animals, three with plants and 12 with food and drinks. The remaining 50 metaphors were associated with immobile objects and abstract ideas. The metaphors created by the students were divided into six general groups (see Table II). These were

- Computer game as a basic need.
- Computer game as a beneficial mean.
- Computer game as a means of entertainment.
- Computer game as a source of addiction.
- Computer game as a means of withdrawal.
- Computer game as a source of evil.

A. Category 1: Computer Game as a Means of Entertainment

In this category, 90 students presented 17 metaphors (Table II). The most important of these metaphors are source of entertainment (38), means of recreation (8), entertainment center (7), game (real life) (7), and adventure (5). The students who created these metaphors perceive 'computer game' as a means of entertainment. Some of the metaphors in this category and reasons students stated for creating them are as follows:

- 'Computer game' is like a source of entertainment, because it amuses me when I am demoralized and I forget what causes my sadness (Student 12, Grade 3).

- 'Computer game' is like an entertainment center, because games surround me and drag me into the computer and they amuse me (Student 38, Grade 7).
- 'Computer game' is like a means of recreation, because when I start playing a computer game, I get sucked into the game in ten minutes and spend 3-4 hours without realizing it (Student 11, Grade 8).
- 'Computer game' is like an adventure, because when I am playing the game, I feel like I am in an adventure in the game (Student 19, Grade 7).
- 'Computer game' is like an amusement park, because it is very amusing, exciting, and sometimes mind-developing, but sometimes it is also dangerous (Student 25, Grade 8).

TABLE II
CATEGORIES OF METAPHORS ABOUT 'COMPUTER GAME'

Categories	Metaphor (Frequency)
Computer game as a means of entertainment	Source of entertainment (38), means of recreation (8), entertainment center (7), game (real life)(7), adventure (5), television (5), excitement (4), car race (3), amusement park (3), playing football (2), toy (2), bicycle (1), film (1), hobby (1), aeroplane (1), clown (1), princess (1)
Computer game as a beneficial means	Friend (34), book (5), mathematics (4), heaven (3), comfort(3), angel (3), medicine (2), sibling (2), family (2), hero (2), flower (1), antidote (1), vacuum cleaner (1), cat (1), fire extinguisher (1), father (1)
Computer game as a basic need	Chocolate (16), candy (13), water (9), food (4), lifestyle (4), ice-cream (3), cake (2), cola (2), a must of life (2), pizza (2), baklava (2), cauliflower (1), love (1), oxygen (1), breath (1), chips (1), tea (1)
Computer game as a source of evil	Monster (19), time consumer (11), prison (5), harmful substance (3), poison (3), ocean (2), horror film (2), vampire (2), microbe (2), war (2), hourglass (1), darkness (1), devil (1), death (1), enemy (1), battery (1), outer space (1)
Computer game as a means of withdrawal	Another world (15), life (8), bird (2), the person I fantasize to be (2), the sea (1), universe (1)
Computer game as a source of addiction	Cigarette (7), alcohol (5), harmful habit (3), narcotic drug (2), magnet (1), seed (1)

B. Category 2: Computer Game as a Beneficial Means

In this category, 66 students presented 16 metaphors (Table II). The most important metaphors in this category are friend (34), book (5), mathematics (4), heaven (3), comfort (3), and angel (3). The students, who created these metaphors, perceive 'computer game' as a completely useful means or one that provides benefit when used carefully. Some of the metaphors in this category and reasons students stated for creating them are as follows:

- 'Computer game' is like a friend, because it is always with us. It is with us when we are bored; it is with us when we feel sad (Student 45, Grade 6).
- 'Computer game' is like a friend, because I have a good time with it just like I do with my friends (Student 56, Grade 6).
- 'Computer game' is like a book, because it is enjoyable, you want to read more as long as you do. Likewise, you want to play a computer game more as long as you play it (Student 31, Grade 8).
- 'Computer game' is like mathematics, because it is both

enjoyable and tiring (Student 25, Grade 7).

- 'Computer game' is like a sibling, because I play with it in good times and in bad times (Student 17, Grade 6).
- 'Computer game' is like a cat, because it is cute and nice, but I might get ill if its hair gets into my lungs (Student 101, Grade 8).
- 'Computer game' is like a medicine, because it refreshes and relaxes me, but its excessive use is harmful (Student 110, Grade 7).
- 'Computer game' is like a hero, because it saves me from trouble (Student 102, Grade 6).

C. Category 3: Computer Game as a Basic Need

In this category, 65 students presented 17 metaphors (Table II). The important metaphors created in this category are chocolate (16), candy (13), water (9), food (4), lifestyle (4), and ice cream (3). The students who created the metaphors listed in this category perceive 'computer game' as one of their basic needs. According to these students, 'computer game' is like the needs necessary to maintain their daily lives, such as chocolate, candy, water, and food. Some of the metaphors in this category and reasons students stated for creating them are as follows:

- 'Computer game' is like water, because we cannot live without it, just like we cannot live without water (Student 100, Grade 6).
- 'Computer game' is like candy, because I like eating it, but it is harmful (Student 53, Grade 7).
- 'Computer game' is like candy, because I want to eat it more and more (Student 236, Grade 5).
- 'Computer game' is like oxygen, because it is my source of life (Student 13, Grade 8).
- 'Computer game' is like cola, because it is nice but harmful, just like cola (Student 34, Grade 8).
- 'Computer game' is like chocolate, because it is very nice to eat it, but its damage shows up in time (Student 98, Grade 5).
- 'Computer game' is like food, because you can have it in every repast (Student 3, Grade 7).
- 'Computer game' is like love, because it is a must for every human being (Student 245, Grade 6).
- 'Computer game' is like lifestyle, because it reflects the personality of an individual (Student 77, Grade 6).

D. Category 4: Computer Game as a Source of Evil

In this category, 58 students presented 17 metaphors (Table II). The most important of these metaphors are monster (19), time consumer (11), prison (5), poison (3), vampire (2), and microbe (2). The students who created these metaphors perceive 'computer game' as a source of evil. According to these students, 'computer game' is a dangerous medium that steals their time. Some examples of the metaphors in this category and reasons stated by students for creating them are as follows:

- 'Computer game' is like a monster, because it harms us (Student 145, Grade 6).
- 'Computer game' is like a monster, because it consumes

our time and prevents us from studying (Student 132, Grade 8).

- 'Computer game' is like a prison, because it captures us and causes loss of time (Student 57, Grade 6).
- 'Computer game' is like a poison, because it kills the brains of children and children show no interest to school subjects (Student 151, Grade 6).
- 'Computer game' is like a microbe, because it follows us even if we run away from it (Student 118, Grade 6).
- 'Computer game' is like a vampire, because it sucks our time and hinders our studies. (Student 143, Grade 6).
- 'Computer game' is like an ocean, because you cannot come out once you dive too deep (Student 98, Grade 6).

E. Category 5: Computer Game as a Means of Withdrawal

In this category, 29 students presented six metaphors (Table II). The important metaphors in this category are another world (15), life (real) (8), bird (2), and the sea (1). The students in this group perceive 'computer game' as a component of their imagination and a means to help them become free. Some of the metaphors developed in this category and reasons the students asserted for creating them are as follows:

- 'Computer game' is like another world, because the characters in the game can do unrealistic things like flying and killing each other (Student 111, Grade 8).
- 'Computer game' is like real life, because some games so much pull you in that you almost feel as if you live the moment your characters do (Student 67, Grade 7).
- 'Computer game' is like the sea, because it takes me in and away (Student 99, Grade 6).
- 'Computer game' is like a bird, because it makes me feel free (Student 63, Grade 8).

F. Category 6: Computer Game as a Source of Addiction

In this category, 19 students presented six metaphors (Table II). The important metaphors in this category are cigarette (7), alcohol (5), harmful habit (3), and narcotic drug (2). The students in this group perceive 'computer game' as a source of addiction. According to these students, a person addicted to computer games can never give up playing. Some of the metaphors developed in this category and reasons students asserted for creating them are as follows:

- 'Computer game' is like cigarette, because it causes addiction as you play more (Student 171, Grade 8).
- 'Computer game' is like alcohol, because you cannot break free from it once you start playing, even if you do not like it (Student 19, Grade 6).
- 'Computer game' is like a harmful habit, because at first it makes you happy, but causes problems in the future (Student 124, Grade 7).
- 'Computer game' is like (eating) sunflower seeds, because you cannot stop once you start playing (Student 104, Grade 8).
- 'Computer game' is like a magnet, because it attracts me when I start it up and I can no more stop playing (Student 119, Grade 7).

IV. DISCUSSION AND CONCLUSIONS

In the present study, the metaphors that middle school students have for computer games are investigated. The metaphors created by the students were grouped in six categories, based on the source of the metaphor. These categories were ordered as 'computer game as a means of entertainment', 'computer game as a beneficial means', 'computer game as a basic need', 'computer game as a source of evil', 'computer game as a means of withdrawal', and 'computer game as a source of addiction', according to the number of metaphors they included.

A review of the literature shows some of the reasons for playing computer games include entertainment, challenge and lack of something else to do [10]. According to the findings of the present study, middle school students see computer games as a means of entertainment. Students used metaphors such as 'amusement park', 'excitement', 'a means of passing time', and 'car race' to indicate computer games are a source of entertainment for them. A student's (56) view of computer games was '...Computer game is like an amusement park, because it is very amusing, exciting, and sometimes mind-developing, but sometimes it is also dangerous...' According to the European Online Children Research Project, in Turkey, children between the ages of 9 and 16 used the Internet an average of 1-1.5 hours a day. The project also stated approximately 50 % of the children used the Internet to pass time and to play games.

Although the primary objective of playing computer games is to have fun, children can obtain the knowledge they need [14]. It is mentioned computer games could create a new learning culture that would better correspond with students' habits and interests [15]. Another important finding in the present study is computer games are perceived as a beneficial means. In this study, the students used metaphors, such as 'mathematics', 'book', 'heaven', and 'angel' to describe the concept of 'computer game'. For example, one student (71) stated 'Computer game is like mathematics, because it is both enjoyable and tiring' and another student (233) said 'Computer game is like a book, because it is enjoyable, you want to read more as long as you do. Likewise, you want to play a computer game more as long as you play it'. Oktay [3], children can reinforce various concepts they learn in everyday life and during their education through computer games. These games may contribute to the development of the child's problem-solving skills through various applications.

Another mental image that middle school students have of computer games is they perceive these games as a basic need. Under this category, students used metaphors, such as 'chocolate', 'candy', 'ice cream', 'pizza', 'breath', 'chips', and 'love'. For example, a student (98) stated 'Computer game is like chocolate, because it is very nice to eat it, but its damage shows up in time', while another student's (3) statement was 'Computer game is like food, because you can have it in every mealtime'. Based on the metaphors used by the students, it can be said they see computer games as an indispensable means, which they enjoy playing. Students perceive computer games as a part of their daily lives that may

cause negative effects. In a study on primary education students, [1] found children playing computer games were held back from performing their duties; they preferred playing games to other activities. It was stated families needed to take responsibility for helping children, especially those at the age for playing games, to form a habit of playing computer games in a controlled manner. While stating computer games are a basic need for them and they enjoy playing them, students at the same time emphasize the harmful aspects of playing these games. This finding might show students have a high level of awareness for the negative aspects of computer games.

Another category for the metaphors obtained in this study was 'computer game as a source of addiction'. In this category, the students generally identify computer games with an addictive substance (e.g. 'alcohol', 'cigarette') and they draw attention to the negative effects of games on individuals despite the pleasure of playing them. Excessive offline and online computer gaming could be the first indicator of computer addiction [25], [26]. A review of the literature shows Harris [27], one of the negative aspects of computer games is game addiction. In a study on the effects of computer games on hostility, social skills, and students' academic performance, it was determined a relationship between game addiction and academic performance existed [28]. Bilgi [29] states as the degree of computer game addiction increases, the level of antisocial aggression increases also. It can be said the students have an awareness of the harmful effects of computer games in this category. For example, a student stated (207), 'Computer game is like harmful habit, because at first it makes you happy, but causes problems in the future', and while another student stated 'Computer game is like cigarette, because it causes addiction as you play more.'

The students, who participated in the study, expressed their view that computer games were harmful for them by using metaphors, such as 'vampire', 'microbe', 'monster', 'devil', 'war', and 'prison' to describe these games. A student stated (249), 'Computer game is like a vampire, because it sucks our time and hinders our studies'. As understood from this statement, some students are aware of the harmful effects of computer games and these games occupy too much time. As stated in the literature, problems, such as deterioration of relationships and switches in school and working life, may occur with a child who spends excessive time playing computer games [16], [30]. This category shows excessive use of technology and computers may have negative effects on children.

Related literature stated computer games are played by children also for purposes of passing time, and relaxing or avoiding stress [7]-[9]. Also in the present study, students, who created the metaphors listed in the category of 'computer game as a means of withdrawal', stated computer games had a function that allowed them to get away from the real world and get rid of stress. Metaphors, such as 'another world', 'the sea', and 'universe', were grouped into this category. A student stated, 'Computer game is like the sea, because it takes me in and away', while another student used the statement 'Computer game is like a bird, because it makes me feel free.'

Keepers [31] conducted a case study for a 12-year old boy, who manifested a pathological preoccupation with video games. In Keepers' study, it was observed the boy played computer games for 4-5 hours per day. Additionally, the boy, who skipped school and had problems with his friends, had problems also with this father. Therefore, he played computer games to escape from conditions at home. In the literature, withdrawal was stated as an aspect of Internet addiction [32]. The emergence of the category of withdrawal in the present study also shows computer game use by participating children may suggest the presence of an addiction.

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REFERENCES

- [1] M. B. Horzum, T. Ayas, and Ö. Ç. Balta, "Çocuklar için bilgisayar oyun bağımlılığı ölçeği." *Türk PDR (Psikolojik Danışmanlık Rehberlik) Dergisi* 3, no.30, pp.76-88, 2008.
- [2] F. K. Çelen, A. Çelik, and, S.S. Seferoğlu. "Çocukların internet kullanımları ve onları bekleyen çevrim-içi riskler." *Akademik bilişim, İnönü Üniversitesi, Malatya*, 2011.
- [3] A.Oktay, "Yaşamın Sihirli Yılları: Okul Öncesi Dönem." İstanbul: Epsilon Yayınları, 1999.
- [4] J.Kirriemuir 2002, "Video Gaming, Education and Digital Learning Technologies." *D-Lib Magazine* 8, no.2. <http://www.dlib.org/dlib/february02/kirriemuir/02kirriemuir.html>. (accessed October 12, 2012).
- [5] J.E. Brand, S.J. Knight, and J. Majewski. The diverse worlds of computer games: a content analysis of spaces, populations, styles and narratives. First level up digital games research conference, University of Utrecht, The Netherlands, 2003.
- [6] C. F. Graunmann, Motivation. Frankfurt am Main: Akademische Verlagsgesellschaft, 1971.
- [7] J.Fritz, 'Macht, Herrschaft und Kontrolleim Computerspiel', in J. Fritz and W. Fehr (eds): *Handbuch Medien: Computerspiele*, Bonn: Bundeszentrale für Politische Bildung, 1997, pp. 183-97.
- [8] Y.İnal, and K. Çağiltay. İlköğretim öğrencilerinin bilgisayar oyunu oynama alışkanlıkları ve oyun tercihlerini etkileyen faktörler. Eğitimde yeni yönelimler II. eğitimde oyun sempozyumu, Ankara Özel Tevfik Fikret Okulları, 2005.
- [9] C. S. Wan, and, W. B. Chiou. Why are adolescents addicted to online gaming? An interview study in Taiwan. *Cyber psychology & Behavior* 9, no.6, 2006, pp. 762-766.
- [10] M. D.Griffiths, and, N.Hunt. Computer game playing in adolescence: Prevalence and demographic indicators. *Journal of Community and Applied Social Psychology* no.5, 1995, pp.189-193,
- [11] M. J. Healy, Bağlantı Doğru mu? Bilgisayarlar Çocuklarımızın Zihnini Olumlu ve Olumsuz Yönde Nasıl Etkiliyor? (çev. Ahmet Gürsel). İstanbul: Boyner Holding Yayınevi, 1999.
- [12] G.Smith, How do computer games affect your children? *Eurasian Journal of Educational Research* Oct, no.17:, 2004, pp.72-80.
- [13] B.Cesarone, Video games and children. ERIC Clearinghouse on Elementary and Early Childhood Education. <http://www.eric.ed.gov/PDFS/ED365477.pdf>. (accessed June 25, 2012), 1994.
- [14] Pillay, H. 2002. An Investigation of Cognitive Processes Engaged in by Recreational Computer Game Player: Implications for skills of the Future. *Journal of Research on Technology in Education* 34, no.3: p.336.
- [15] M.Prensky, Digital game based learning. New York: McGraw-Hill, 2001.
- [16] NIMF. Computer and video game addiction. National Institute on Media and the Family. http://www.mediafamily.org/facts/facts_gameaddictions.html. (accessed December 17, 2012), 2005.
- [17] S. Chiu, J.Z. Lee, and D. H. Huang. Video game addiction in children and teenagers in Taiwan. *Cyberpsychology & Behavior* 7, no.5, 2004, pp.571-581,

- [18] M. R. Hauge, and D.A. Gentile. Video game addiction among adolescents: associations with academic performance and aggression. Presented at society for research in child development conference, Tampa, FL. <http://www.psychology.iastate.edu/FACULTY/dgentile/SRCD%20Video%20Game%20Addiction.pdf>. (accessed October 12, 2012), 2003.
- [19] V. W.Setzer, and G. E. Duckett. The risks to children using electronic games. Presented as a poster paper at the Asia Pacific Information Technology in Training and education conference and exhibition, Brisbane, Australia. <http://www.ime.usp.br/~vwsetzer/video-g-risks.html>. (accessed July 26, 2012), 1994.
- [20] C. S.Wan, , and W. B. Chiou. 2006. Why are adolescents addicted to online gaming? An interview study in Taiwan. *Cyberpsychology & Behavior* 9, no.6: 762-766.
- [21] J.Cooper, and, D.Mackie, Video Games and Aggression in Children1. *Journal of Applied Social Psychology*, no.16, pp.726-744, 1986.
- [22] A.Yıldırım, and, H. Şimşek. Sosyal bilimler denitel araştırma yöntemleri. Seçkin, 2006.
- [23] A. Saban, Okula ilişkin metaforlar. Kuram ve Uygulamada Eğitim Yönetimi, no.55, 2008, pp.459-496.
- [24] M. B. Miles, and, A. M. Huberman, Qualitative data analysis: An expanded sourcebook. Sage, 1994.
- [25] M. Fleming, and D. Rickwood. Teens in cyberspace. *Youth Studies Australia* 23, no.3: 46-52, 2004.
- [26] J. C.Watson, Internet addiction diagnosis and assessment: Implications for counselors. *Journal Of Professional Counseling: Practice, Theory, & Research* 33, no.2:17-30, 2005.
- [27] J. Harris, 2001. The effects of computer games on young children: A review of the research (Vol. 72). Great Britain, Home Office, Research, Development and Statistics Directorate.
- [28] S.Chiau, J.Z. Lee, and, D. H. Huang. Video game addiction in children and teenagers in Taiwan. *Cyberpsychology & Behavior* 7, no.5, 2004, pp.571-581
- [29] A.Bilgi, 2005. An investigation an the levels of aggression, depression and loneliness of computer game playing and non-playing primary school students. Unpublished master's thesis, Marmara University, İstanbul.
- [30] S. L.Calvert, and, S. L. Tan. Impact of virtual reality on young adults' physiological arousal and aggressive thoughts: Interaction versus observation. *Journal of Applied Developmental Psychology*, no.15: 125-139, 1994.
- [31] G.A.Keepers, "Pathological preoccupation with video game". *Journal of the American Academy of Child and Adolescts Psychiatry* 29, 1990, pp.49-50
- [32] S.Kesici, and, I. Sahin. Turkish adaptation study of Internet addiction scale. *Cyberpsychology, Behavior, and Social Networking* 13, no.2: 2010, pp.185-189.

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