PERCEPTIONS OF PROSPECTIVE COMPUTER TEACHERS TOWARD THE USE OF COMPUTER GAMES WITH EDUCATIONAL FEATURES IN EDUCATION

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PERCEPTIONS OF PROSPECTIVE COMPUTER TEACHERS TOWARD THE USE OF COMPUTER GAMES WITH EDUCATIONAL FEATURES IN EDUCATION

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Approval of the Graduate School of Natural and Applied Sciences

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I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

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This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

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ABSTRACT

PERCEPTIONS OF PROSPECTIVE COMPUTER TEACHERS TOWARD THE USE OF COMPUTER GAMES WITH EDUCATIONAL FEATURES IN EDUCATION

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This study investigates the perceptions of prospective computer teachers, who have been studying at the Computer Education and Instructional Technology (CEIT) departments of four different universities, toward the use of computer games with educational features in education. It also examines the future plans of the participants regarding the use of computer games with educational features in their courses or in learning environments that they will design and it explores the participants' computer game playing characteristics as well.

The subjects of this study were 116 students from the Computer Education and Instructional Technology departments of four universities: Ankara, Gazi, Hacettepe and the Middle East Technical University. The data were collected through a questionnaire and

interviews. The data were analyzed by using descriptive statistics and qualitative analysis methods.

This study reveals that the prospective computer teachers who participated in this study have positive perceptions toward the use of computer games with educational features in education. Moreover, most of the participants plan to use such games in their future professions according to their responses. However, it is revealed that participants also have doubts about some issues regarding the use of such games in education, although this is a rare case.

Keywords: Computer games, computer games with educational features, computer games in education

ÖZ

BİLGİSAYAR ÖĞRETMENİ ADAYLARININ EĞİTİCİ YÖNLERİ OLAN BİLGİSAYAR OYUNLARININ EĞİTİMDE KULLANILMASINA YÖNELİK ALGILARI

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Yüksek Lisans, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

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Bu çalışmada dört farklı üniversitenin Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümünde okuyan bilgisayar öğretmeni adaylarının eğitici yönleri olan bilgisayar oyunlarının eğitimde kullanılmasına yönelik algıları araştırılmıştır. Ayrıca katılımcıların eğitici yönleri olan bilgisayar oyunlarını kendi derslerinde ya da tasarlayacakları öğrenim ortamlarında kullanmalarına yönelik gelecek planları incelenmiş ve katılımcıların bilgisayar oyunlarını oynamaya yönelik özellikleri de araştırılmıştır.

Çalışmanın örneklemini, Ankara, Gazi, Hacettepe ve Orta Doğu Teknik Üniversitesinin Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümlerinden 116 öğrenci

oluşturmaktadır. Veriler anket ve görüşme yoluyla toplanmıştır ve verilerin analizinde tanımlayıcı istatistiksel ve nicel veri analizi yöntemleri kullanılmıştır.

Bu çalışma, katılımcı bilgisayar öğretmeni adaylarının, eğitici yönleri olan bilgisayar oyunlarının eğitimde kullanılmasına yönelik, olumlu algıları olduğunu göstermiştir. Bunun yanında, pek çok katılımcı bu tür oyunları gelecekteki mesleklerinde kullanmayı planladıklarını belirtmişlerdir. Fakat, az da olsa bu tür oyunların eğitimde kullanılması açısından, bazı konularda, katılımcıların kuşkuları da olduğu ortaya çıkmıştır.

Anahtar Kelimeler: Bilgisayar oyunları, eğitici yönleri olan bilgisayar oyunları, eğitimde bilgisayar oyunları

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INTRODUCTION

1.1. Background of the Study

Computer games are perceived as one of the most popular leisure time activities that have gained an important role in students' lives (Subrahmanyam, Greenfield, Kraut & Gross, 2001; Cesarone 1998; Yelland & Lloyd, 2001; Durkin & Barber, 2002; Media Analysis Laboratory, 1998; Buchman & Funk, 1996) and it was proved that computer games have become just another type of popular leisure time activities of today's students. Although students generally have a balanced leisure time activity preferences (Media Analysis Laboratory, 1998; Yelland& Lloyd, 2001), spent time and diverted time from other activities for playing computer games was found to be much more (Strasburger & Donnerstein, 1999).

Considering these games as a newly emerging popular activity that many students spent time and construct experiences with, their effects were investigated by many research studies. Regarding the most common opinions of researchers, both positive and negative findings were presented which also have potential to affect people's perceptions. However it was reminded that all games are not always valuable, positive and useful (Rieber, 1996; Subrahmanyam et al., 2001; Prensky, 2001). Durkin and Barber (2002) found no evidence for negative effects of computer games on adolescent development, conversely they associated computer game players with more positive attributes of 'healthy adolescence'

(p.373). Mostly examined areas were self-esteem, academic achievement, prosocial behavior, aggression, addiction, confusion of reality with fantasy and gender bias.

As for learning, the effect of computer games on students' intellectual, visual, motor skills, discovery learning strategies, problem solving skills and computer using skills were examined. Positive findings were emerged considering a development of visual skills (Subrahmanyam et al., 2001; Prensky, 2001; Greenfiled, deWinstanley, Kilpatrick & Kaye, 1994), development of motor skills (Kawashima et al., 1991), and development of computer usage skills (Subrahmanyam et al. 2001; Prensky, 2001; Gorriz & Medina, 2000). However regarding cognitive, thinking and learning skills, Gredler (1994) stated that even though some intellectual skills are required during playing academic games, higher order skills are not required. Besides it was also argued that the opportunity of reflection and thinking is decreased during speedy game playing (Prenksy, 2001; Provenzo, 1992). Regarding the discovery learning and development of problem solving skills, contrary to Gredler (1994), it was asserted that computer game playing requires critical thinking, problem solving skills and discovery learning strategies (Rieber, 1996; Price, 1990; Gorriz & Medina, 2000; Provenzo, 1992; Prensky, 2001; Hong & Lui, 2003).

Other important arguments related with students' learning were about engagement and motivation. Prensky (2001) proposed that students better learn while they highly engage with the activity, which is best provided by learning through computer games. However, it was also argued that games in the market require repetitive activities that may negatively affect students' learning strategies (Price, 1990; Gredler, 1996). Motivation, which is essential for voluntarily learning, is also seen as a product of computer game playing (Prensky, 2001; Rieber, 1996; Rosas et al, 2003).

All of these findings about the effects of computer games on students may have an influence on society's perceptions, parents and teachers in some way if they read such research stuies. Although many researchers tried to convey the importance of these games on students' learning and their lives, 'play' countered a lot of misconceptions as; play is not

serious, applicable to only young children, unrelated with learning and unproductive (Rieber, 1996; Prensky, 2001). While parents share the same positive beliefs with their children about the influence of computer games (Sneed & Runco, 1991), many educators generally perceive recreational computer games as 'time wasters', and educational games as important instructional means (Price, 1990, p. 51; Becker, 2001). Academicians think that the game market has few educationally valuable products and in general games are not designed seriously (Becker, 2001). Rieber (1996) noted that the interest of using games in courses is declined as the grade level increases due to the perceptions of teachers who think that computer games are effective for mostly elementary school levels. It was also supported by Becker (2001) that, computer games are not perceived much careful attention as an instructional tool but assume very much interest in the elementary schools by teachers.

It was stated that the problems in the perceptions of teachers is really apparent considering the problem in the traditional education. While new generation students, who spent time with computer games as other leisure time activities, have different needs, learning styles, experiences, interests and outlooks that are much different from their teachers (Prensky, 2001), teachers are unaware about these so this situation create problems of communication between two generation. Teachers continue to use old ways of teaching, "slowly, step-by step, one thing at a time, individually, and above all, seriously" (Prensky, 2001b, ¶8). For that reason traditional educational system is not working as in the case of CAI and web based learning in which the same boring content and boring instructional strategy is used (Prensky, 2001). To eliminate this problem, educators should not ignore the impact of computer games as a way to promote learning of new generation (Yelland & Lloyd, 2001).

In terms of using computer games in education, there were many propositions that stressed that, teachers should be careful about the effects of games on students (Provenzo, 1992), and they should also be careful about the selection of the game among badly designed games. Moreover, before using these games, teachers should be careful about the weakly

desgined research studies (Gredler, 1996). Four ways of using games in education were stated as to practice previously learned knowledge, to diagnosis the weak points, to review the content and to help students develop new connections between concepts and principles and as a reward (Gredler, 1994). Furthermore, many opinions about using computer games in education were proposed.

However, contrary to all of these positive propositions to use computer games in courses, even computers are not used as effectively as possible in the practice (Grabe & Grabe, 1998; OTA, 1995). It was found that about half of the practicing teachers do not use computers in their courses at all (Marcinkiewicz, 1995). Moreover, teachers' aim of using computers also differs according to grade levels. While secondary grade students use it as a tool, elementary grade students use them to learn the content (OTA, 1995) and elementary school teachers generally make use of computers for students to work on drill-practice of basic skills and playing instructional games (OTA, 1995).

The reasons for not effectively using computers were reported as: lack of availability, lack of time to learn new technology, lack of knowledge and skills, teachers' negative attitudes toward innovations, their fear to lose authority and fear of unknown (OTA, 1995; Grabe & Grabe, 1998; Heinich, Molenda, Russell & Smaldino,1996; Lunenburg & Ornstein, 1996). However, it was argued that teachers have the potential to change this picture (Whetstone & Carr-Chellman, 2001; Grabe & Grabe, 1998).

In conclusion, although there is some amount of literature about computer games and their effects on students' learning, there is a very critical gap in the literature about the teachers' and prospective teachers' game playing characteristics, their perceptions about using computer games in education and their future plans about this issue.

1.2. Statement of the Problem

New generation students have different needs, interest and experiences than their instructors (Prensky, 2001; Calvert & Jordan, 2001). "What is done in schools needs to be

viewed in relation to society and with reference to what is meaningful or relevant in the lives of young people." (Yelland & Lloyd, 2001, p. 191). However, traditional education teachers who try to teach these students with the old methods of instruction are unaware of this reality of difference and this cause communication conflict between these two groups, that have negative effects on students' learning (Prensky, 2001). Although several actions were taken to increase teachers' use of technology, especially computers, teachers do not use them either due to some resistance related with their perceptions and attitudes or some external factors (OTA, 1995; Grabe & Grabe, 1998; Heinich, Molenda, Russell& Smaldino,1996; Lunenburg & Ornstein, 1996).

For this reason, even though the use of computer games with educational features are planned to be used in education system to satisfy new generation students, without knowing teachers perceptions about this issue, the efforts may be wasted. In the literature there is not enough study that investigate teachers' and prospective teachers' perceptions about using computer games in their courses and their future plans. This gap in the literature creates barriers for effectiveness and efficiency of futuristic actions.

Furthermore, the literature mainly concentrates on the students regarding the computer games in education. However the average age of playing computer games is 28 for the Americans (Interactive Digital Software Association, 2001), which may include teachers and prospective teachers, but there is lack of study that describes this new generation teachers' computer game playing characteristics which may also have effect on their perceptions toward the use of computer games with educational features in their courses.

1.3. Purpose of the Study

The purpose of the study is to investigate;

- computer game playing characteristics of prospective computer teachers, who have been studying at the Computer Education and Instructional Technology (CEIT) departments of different universities

- perceptions of subjects toward the use of computer games with educational features in education
- future plans of subjects regarding the use of computer games with educational features in their courses or in learning environments which they will design.

Specifically, the research questions and sub questions that this study is based on are:

1. What are the computer game playing characteristics of prospective computer teachers, who have been studying at the Computer Education and Instructional Technology (CEIT) departments of different universities?

1.1. What are the subjects' accesses to computer games?

1.2. What are the subjects' previous experience with games including their first access, time they spent with computer games and games on other platforms.

1.3. What are the subjects' current experiences of games in terms of time spent for computer game playing among other leisure time activities?

1.4. What are the subjects' general perceptions toward computer game playing?

1.5. What are the subjects' preferences of games and game types?

2. What are the perceptions of prospective computer teachers, who have been studying at the Computer Education and Instructional Technology (CEIT) departments of different universities, toward the use of computer games with educational features in education?

2.1. What are the subjects' perceptions toward the use of computer games with educational features, in the curricula?

2.2. What are the perceptions of subjects in terms of capabilities of computer games with educational features, in helping students to fulfill the educational learning goals that are defined in the schools' curricula?

2.3. What are the perceptions of subjects in terms of the way computer games with educational features should be used in education to be more effective in students' learning?

2.4. What are the perceptions of subjects in terms of students' and teachers' thinking of the use of computer games with educational features in education?

3. What are the future plans of subjects regarding the use of computer games with educational features in their courses or in learning environments which they will design?

1.4. Significance of the Study

Examining the computer game playing characteristics of prospective computer teachers, their perceptions toward the use of computer games with educational features in education and their future plans regarding the use of these games in their courses or in learning environments which they will design is important in several aspects.

To change the current situation of old style traditional education system, computer games are seen as the valuable tools that can be used to provide opportunities for students to learn effectively (Prensky, 2001; Rieber, 1996). However, without knowing teachers' and prospective teachers' perceptions about using it in their courses, any change will end up with futile results as in the case of using computers in education in which, even though accessibility rates are increasing, teachers do not use computers as effectively as possible (OTA, 1995). Clearly, this investigation will provide some useful information for educators and planners to consider before using computer games with educational features in education. Similarly by knowing their future plans about using these games will help educators and planners to take safer actions about integration of these games in the education system.

Since this group of people has the conjunction roles and characteristics of both students and teachers, investigation of their game playing characteristics and perceptions toward the use of computer games in education will provide useful information for both of these roles. Not only perceptions and future plans, but also their computer game playing characteristics are important to understand new generation students' characteristics to increase awareness of their differences ones more.

Considering the unawareness of old generation teachers about students' needs, interests and learning styles (Prenksy, 2001), these prospective teachers' opinions and futuristic plans will provide information for predicting the picture of courses in the near future, whether they will select one side of the situation by becoming a teacher that is similar to the ones that do not respond to students needs, interests and learning styles, or becoming a teacher that has different opinions than the older generation teachers about computer games by utilizing computer games in their courses .

In conclusion, this study is important to gain some evidence that may provide educators a perspective of prospective teachers' way of perceiving the use of computer games in education, besides providing an item to better visualize the whole picture of the future situation of courses regarding the use of computer games.

1.5. Definition of Terms

Play

Play is generally defined as having the following attributes: "It is usually voluntary; it is intrinsically motivating; that is, pleasurable for its own sake, and is not dependent on external rewards; it involves some level of active often physical engagement; it is distinct from other behavior by having a make –believe quality" (Rieber,1996, p.44).

Game/ Computer Game

Organized play (Prensky, 2001, p. 119). A game is an activity in which participants follow prescribed rules that differ from those of real life as they strive to attain a challenging goal (Heinich et al, 1996, p. 326).

Since the games played on a computer are similar to the games played on other platforms, the operational term "computer games" is used to refer all kinds of electronic games or digital games. But in the literature review part some of the terminology remains the same.

In this study as a definition of game, the researcher refers to all games included in the thick borders showed in the Figure 1.1. which comprises instructional games (IG), simulation games (SG), Instructional simulation games (ISG), and all other games that do not fit one of these categories which are played on any electronic or digital tool.

Reference to '**computer games with educational features**' implies that games that is in the definition given in the thick borders of Figure 1.1.but that have any positive effect on students' learning.

Simulation

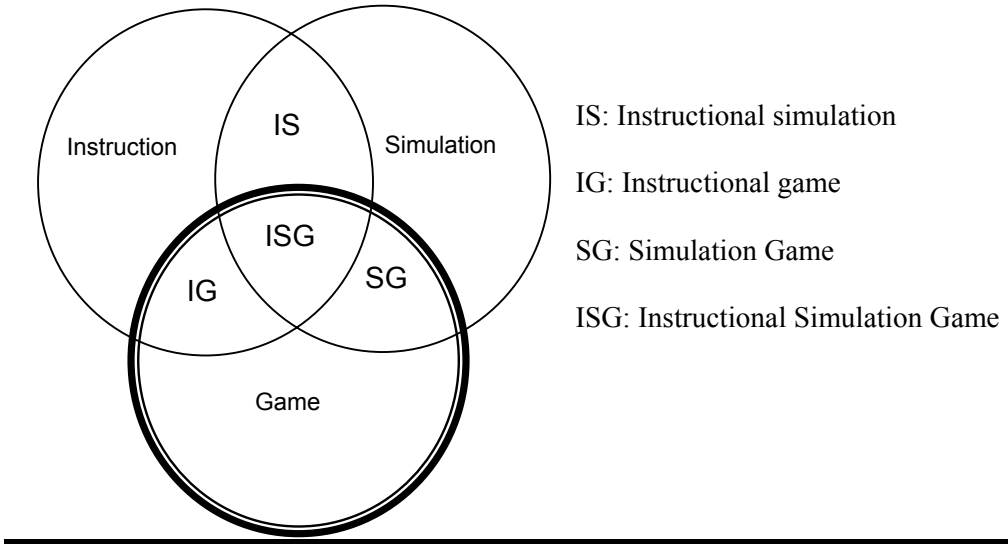
A simulation is an abstraction or simplifiaction of some real life situation or process. (Heinich et al. p. 329). Simulations are not, in and of themselves, games. They need all the additional structural elements - fun, play, rules, a goal, winning, competition, etc" (Prensky, 2001, p. 212)

Simulation Game

In fact, the content and messages of a "simulation" and a "simulation game" can be exactly the same- the difference comes from the game's engagement and challenges." (Prensky, 2001, p. 218)

Instructional / Educational Game

A decision-making activity that usually includes the following features: "One or more players (decision makers), rules of play, one or more goals that the players are trying to reach, conditions introduced by chance, a spirit of competition, a strategy or pattern of action-choices to be taken by the players, a feedback system for revealing the state of the game, a winning player or team" (Price, 1990, p. 52).



Note: From "Instructional media and technologies for learning" (p. 327), by Heinich, R., Molenda, M. Russell, J.D.& Smaldino, S.E.,1996. Prentice Hall. Adapted with the permission of the authors.

Figure 1.1. Instruction, simulation and game

CHAPTER 2

LITERATURE REVIEW

This chapter attempts to summarize and synthesize the relevant literature regarding the research questions proposed in the previous chapter. Firstly games will be defined regarding the different platforms and their taxonomies, and then new generation students' leisure time preferences will be investigated to determine the importance of computer games in their lives. Students' game preferences are also investigated to understand their interests and needs in relation with the social effect. Next, some of the empirical findings and opinions are depicted about the positive and negative effects of computer games on students in general and in terms of their learning, in case of their influence on teachers' and students' perceptions that are also examined. The last three section are aimed to describe a brief overview of some problems due to generation disparity between students and teachers and due to perception problems, some considerations about using games in education and finally teachers' perspectives and use of computers in their courses, and their potential of changing the current situation is provided.

As for Turkey, there are few studies that are related with the computer games. However, none of them is related with this study.

2.1. Games, Different Platforms and Game Taxonomies

Games can be shortly defined as "organized play" (Prensky, 2001, p. 119). To explain further Price defined some elements that is included generally in a game. These are: "one or more players (decision makers), rules of play, one or more goals that the players are trying to reach, conditions introduced by chance, a spirit of competition, a strategy or pattern of action-choices to be taken by the players, a feedback system for revealing the state of the game, and a winning player or team." (Price, 1990, p. 52) In addition to these, Alessi and Trollip (2001) added some other characteristics as "turn-taking, fantasy, equipment, and some combination of skill versus luck" (p.271)

Since they are generally mixed, Gredler (1996) defined the differences between games and simulations as; "games are competitive exercises in which the objective is to excel by winning" (p. 522). However, in simulations the participants take responsible roles and important tasks to complete, which has no relation with winning. Another difference is that, games have linear 'event sequence' while simulations have not. Similarly, Gredler (1994) defined a characteristic of games which is different from the simulations is that, rules and conclusions are not related with the real life, however in simulation they are highly related. Prensky (2001) differentiate between simulations and games in that, "simulations are not, in and of themselves games. They need all the additional structural elements - fun, play, rules, a goal, winning, competition, etc" (p. 212).

Contrary to Gredler who criticized the use of terms games and simulations together as a new game type, many categories provided included a category as gaming-simulation or simulation games. One of them was Prensky who argued that "depending on what it is doing, a simulation can be a story, it can be a game, it can be a toy" (2001, p. 128).

As we consider games in general, there is a growing body of literature about games on different platforms, however most of them did not identify their individual effects and used different terms interchangeably (Durkin & Barber, 2002). McGrenere (1996) supported that in the literature, rather than focusing on the platforms, the research studies generally

tried to define the interaction patterns. Three platforms are generally mentioned in the literature. Yelland and Lloyd (2001) and McGrenere (1996) defined them as: Video, computer and arcade. However, among them, Prensky (2001) tried to differentiate why computers are generally preferred as a platform to play games. Computers are stated as better mediums for playing games because they take care of the rules automatically and the player has no need to know all the small rules. Also with this digital medium, the game can be played with multi-players. Computer medium provides faster actions, excellent graphics, various options and contexts, various levels of difficulty and fun aspects etc.(Prensky, 2001).

Table 2.1. A summary of game type definitions, Prenksy (2001)

Game Type	Description
Action	Speedy games, shooting games, 'car races, chases', etc. games
Adventure	Solving the unknown situations, collecting objects etc. games
Fighting	Includes speedy, athletic movements.
Puzzle	Includes generally visual problems.
Role-Playing	Games in which user plays a character and changes the characteristics of it.
Simulation	Includes building up some things, driving and flying some vehicles.
Sports	Generally include action sport games in which content of the game is important.
Strategy	Building up and modifying something important and hard to manage.

Regarding the game types, there are many classifications. Prensky also created a categorization as seen in the Table 2.1. (2001, p. 130). Media Analysis Laboratory (1999) research reported similar groupings for video games as: Action, puzzle, educational, fighting/combat, sports, racing, role play/adventure, and simulation games. Yet, Yelland and Lloyd (2001) distributed the action games into many other categories as: flight, racing, shoot'em, platform games. Alessi and Trollip (2001) combined adventure and role-playing games while adding business, board, word games as new categories. According to their study of violence issues, Funk, Hagan and Schimming (1999) created a different taxonomy as:

General entertainment, educational, fantasy violence, human violence, non-violent sports, sports violence.

Price (1990) categorized educational games in to two: Academic games and life simulation games. Academic games aim to teach something and provide practice environments while motivating the learners. Life simulation games are further categorized as context simulation games that generally include strict rules and real-life contexts; and open-ended life simulation games that include social science contexts and provide flexibility in rules and goals.

In the review of the past research studies which were conducted with the older types of computer games, it is apparent that the review of the results of these studies would be meaningless other than the ones that focused on the fundamental issues about computer games. Since the games played on a computer are similar to the games played on other platforms, the operational term "computer games" will be used to refer all kinds of electronic games or digital games, unless specifically stated in the research studies.

2.2. Computer Games and Students' Leisure Time Preferences

Among many leisure time activities, computer games are perceived as one of the most popular ones that have gained an important role in people's lives (Subrahmanyam, Greenfield, Kraut& Gross, 2001; Cesarone, 1998; Yelland & Lloyd, 2001; Durkin & Barber, 2002; Media Analysis Laboratory, 1998; Buchman & Funk, 1996). With increased accessibility rates (Media Analysis Laboratory, 1998) of computers and game equipments in homes over recent years (totally 90 percent in the U.S.)(Turow & Nir 1999; Stanger & Gridina, 1999) the questions arise about the leisure time preferences of students although Media Analysis Laboratory (1998) found weak relationship between the time spent with games and access rates to equipments.

It is reported that students generally have a balanced leisure time activity preferences among diversity of activities and computer games (Media Analysis Laboratory, 1998;

Yelland & Lloyd, 2001). The study of Stanger and Gridina (1999) presented that students generally spent more time with television (2,46 hour/day), schoolwork (1,14 h/d), computer (0,97 h/d), books (0,77 h/d), and videogames (0,65 h/d) (p.9). Another study showed that as their allocated mean time for television is 13 hours per week, for computer games it is 5 hours per week (Media Analysis Laboratory, 1998). Prensky (2001b) claimed that new generation students spent more than 10.000 hours with computer games in their lives. According to the study of Yelland and Lloyd (2001), the students' computer game playing time depends on the availability of other activities, weather, holiday periods and similar factors. So, many research studies concluded that computer games are just another popular leisure time activities of today's students.

However, Strasburger and Donnerstein (1999) argued that there is not such a balance in the activities because if children spent 2-3 hours a day playing video game or watching television, there will be less time for social activities, reading or physical activities. Media Analysis Laboratory (1998) survey reported that high-play groups also preferred contributing to diverse type of activities, such as watching television and spending time with friends instead of playing computer games, yet they preferred playing games over physical activities. The percentages of diverted time from other activities to play computer games clearly indicated that the mostly abandoned activity is the homeworks (28 %) and although the percentage is low some social activities were given up as well.

Many research studies also focused on the relationship between the time that children spend on computer games and the characteristics of users, such as gender and age. Regarding the age characteristic, a study detected that older kids play games more than younger ones (Turow & Nir, 2000). Specifically, nearly 10 percent of 2-18 years old subjects play games more than one hour a day and 8-13 years old subjects play games more than 7,5 hours a week (Roberts, Foehr, Rideout, & Brodie, 1999). From the perspective of adults the average age of Americans who play video games is 28, and the adults are the ones that buy nine out of ten games (Interactive Digital Software Association, 2001).

In terms combination of gender and age characteristics, even though there is no difference found between the computer using time of younger boys and girls, there is a significant difference found considering the game playing time (Roberts et al., 1999) and this difference is greater between the age of 14 and 18. Supportive studies proved that boys spend more time on computer games than girls (Yelland & Lloyd, 2001; Media Analysis Laboratory, 1998; Durkin & Barber, 2002; Colwell & Payne, 2000) in all 4-8 grades and both at home and arcade (Buchman & Funk, 1996). Prensky claimed that the girls' computer playing time depends on the access to the computers and their level of comfort with the computers (Prensky, 2001). In another study, Buchman and Funk (1996), with the 900 children of grade levels 4 through 8, found that students game playing time depends on the grade level and the place such that, game playing time at home decreased as the grade level increases, however, for arcade games the situation is reversed.

Prensky implies that the parental supervision has a strong effect on the extent of playing computer games (Prensky, 2001). However, the study conducted by Funk, Hagan and Schimming (1999) showed that many parents are unaware of their children's (grades 3 to 5) playing time durations. Moreover, a big proportion of parents do not enforce any rules for playing computer games (Yelland & Lloyd, 2001; Walsh, 2000).

2.3. Students' Computer Game Preferences and Social Effect on Preferences

In this part, students' game and game type preferences are described from two different perspectives. With the agreement of differences in the preferences of students due to many reasons, some of the studies explained the situation regardless of social effect; others grounded the reason of such differences on the social effect on children development process.

Firstly, as considering the preferences of students regardless of social effect, Prensky defined four variables that have effects on game type preferences. These are "age, gender, competitiveness and previous experience with games" (Prensky, 2001, p. 153).

Buchman and Funk (1996) investigated the game type preferences of girls and boys in various grade levels from 4 to 8. Educational game category was preferred less when children's favorite game types were questioned. Also it was found that, educational games have a decreasing popularity as the grade level increases. Furthermore, there is a difference in the percentages of boys and girls preferring educational games as; girls attribute educational games as their favorites more than boys.

Media Analysis Laboratory (1998) study reported that, the mostly preferred game type is 'action-adventure meta genre'. Other generally preferred game types are action, fighting, racing and sports. Also these inclinations depend on the gender and the duration that teens play video games. It is explained that, boys who spent more time with playing video games like action and fighting type games. Whereas boys who spent less time with playing video games like educational or puzzle type games. The same survey reported that teens generally prefer "realism, lots of control and good characters", in addition "unpredictability, excitement, good weapons and interesting story" in games. However these preferences also have a relationship with gender and time spent with video games.

In addition, the gender differences for the preferences of computer games were argued to be resulted from different preferences of playing styles as illustrated in the Table 2.2.

The study of Yelland and Lloyd (2001) emphasized that the types of games preferred on different platforms also differ. In this study, while children prefers platform games such as Mario Brothers as a video game, for computer games boys prefer shoot'em games while girls prefer strategy games.

Secondly, considering the preferences with the social effect on children development process, it was claimed that boys and girls prefer different games due to "the different demands that the society places upon them." (Rieber, 1996, p.55; Funk, Buchman, 1996; Funk, 2001; Dietz, 1998). During the process of creating gender schema with these social stereotypes, children's perceptions about the social approval of game playing habits of boys

and girls found to be contaminated by these social stereotypes (Funk, Buchman, 1996; Colley et al, 1996). An example for this issue is; violence and computer games are seen as appropriate for boys but not for girls.

Table 2.2. Computer game preferences of boys and girls

Girls	Boys	Reference
realistic themes and roles	fantasy themes and roles	(Subrahmanyam et al., 2001 ; Subrahmanyam & Greenfield, 1999)
less realistic fantasy violence games	realistic human violence	(Buchman & Funk, 1996; Funk, 2001)
non-violent games	violent games	(Subrahmanyam & Greenfield, 1999)
'relationships'	'competition'	(Prenksy,2001, p. 140; Subrahmanyam & Greenfield, 1999)
cooperation	competition	(Gorriz & Medina, 2000; Subrahmanyam & Greenfield, 1999)
constructive games	destructive games	(Gorriz & Medina, 2000)
games that make them think	games "fun, exciting, having good graphics, and cool"	(Yelland and Lloyd, 2001, p. 188)
entertainment games	sports games	(Buchman & Funk, 1996; Funk, 2001)
with less number of players	with more players	(Subrahmanyam& Greenfield, 1999).

When the content of the game is appropriate for social gender stereotypes, that game becomes popular in the market. And since the market is mainly male-oriented and have games with negative stereotypes for girls, the popularity of these games are decreased especially for girls and girls become disadvantaged not only for computer games but also computer experiences (Funk, 2001; Dietz, 1998)

Inspecting the perceptions of boys and girls, it is indicated that it is 'acceptable' for both girls and boys to play computer games (Funk & Buchman, 1996, p. 223). Although

boys' right of playing games 'a lot' was agreed on, girls are approved to play 'moderate amounts of time'. Moreover, boys rated more negatively to the statements that violent games are acceptable for girls. It was found that fifth grade students are less stereotyped than fourth grade students about these gender issues. (Funk & Buchman, 1996)

Philipp (1998) broadened the perspective that not only gender but also race determines the approval of many leisure time activities but not the video game playing activity.

2.4. Computer Games and Their Effects on Students

Previous research studies presented various empirical findings and opinions about the positive and negative effects of computer games on students which have a potential influence on teachers' and students' perceptions.

Considering the effects of computer games on students, there are many controversial research studies, while some of which attach positive attributes to computer games in terms of their effects on students, others attach negative ones. However it was emphasized that all games should not be seen as valuable, positive and useful, shortly 'good' (Rieber, 1996; Subrahmanyam, Greenfield, Kraut, Gross, 2001; Prensky, 2001, p.95).

Durkin and Barber (2002) found no evidence for negative effects of computer games on adolescent development, conversely they associated computer game players with more positive attributes of 'healthy adolescence' as "family closeness, activity involvement, positive school engagement, positive mental health, lower substance use, high self-concept, close friendship network, and low disobedience to parents." (p. 373). They found that the most positively scored group about these issues was the group that play computer games a little, but still the high-play group had positive scores about these variables. Furthermore, from none of these variables non-players had high scores. Regarding these positive characteristics of game players, Durkin and Barber did not construct a causal connection

between the effects of computer game playing and these positive scores, but favored such a conclusion regarding the results.

The effects are categorized to increase comprehension, as: Self-esteem, academic achievement, prosocial behavior, aggression, addiction, confusion of reality with fantasy and gender-bias.

2.4.1. Self Esteem

With regard to the explanation of effects further, Durkin and Barber (2002) asserted that teens who play computer games scored better than non-players in terms of mood, self-esteem and self-concept. Some other researchers also supported this result by stating that; the success in a computer game increases the self-esteem of the player (Malone, 1980), and lead to some emotional effects (Prenksy, 2001). Conversely, it was tested that a negative correlation found between the self-esteem and frequency of time play for boys (Colwell & Payne, 2000).

2.4.2. Academic Achievement

As for academic effect, most of the computer game players were found out to have positive engagement with schools. Furthermore, the academic achievement scores of the players who spent a little time with computer games are higher (Durkin & Barber, 2002). When combined with the gender differences, while girls play games less than boys, their academic achievement scores are higher.

Subrahmanyam et al. (2001) argue that there is no a study that presents the relationship between the academic achievement and the computer game playing. In the review study conducted by Emes (1997), no correlation is reported between the academic achievement and video game playing.

According to the researchers, the problem with the research studies is that, the long-term effect of game playing on cognitive learning is not considered. However, the research carried out about 15 years by Cole (1996) proved that “well designed computer games and

Internet activities for home use can have a lasting impact on children's academic performance." (Cole, 1996 cited in Subrahmanyam et al. 2001, p.16).

Among the displacement of activities to play video games, the schoolwork is the one that is displaced mostly, which may have some negative effects (Media Analysis Laboratory, 1998). In support of these findings, the study of Anderson and Dill (2000) showed that there is a negative correlation between the university students' academic achievement and their exposure time to games.

2.4.3. Prosocial Behavior

The prosocial effect of computer games is one of the mostly discussed issues. Colwell and Payne (2000) found no evidence on the negative effect of playing computer games to social behavior. It was claimed that computer games are not only a recreational tool for children but also they are one of the fundamental parts of the social lives of children. (Rieber, 1996). Strengthening these claim, Strasburger and Donnerstein asserted that computer games could be used for 'prosocial learning' (1999, p. 135). Rosas et al (2003) also justified that when playing computer games students help each other to progress in a game, so that increase the social support among students.

It was found that computer game players scored more favorably about family and friendship closeness than non-players (Durkin & Barber, 2002). Moreover some research studies proved that there was no difference found in terms of social interactions among players and non-players of computer games (Phillips, Rolls, Rouse, & Griffiths, 1995). However, the same issue about the frequent players has not been apparent yet (Subrahmanyam, Greenfield, Kraut& Gross, 2001). Contrary to the belief of playing computer games as a solitary activity, Prensky (2001) asserted that, they allow players to become social by providing opportunities to play games with more than one player even though sometimes not face-to-face. Besides, a survey showed that teens prefer playing video games with their friends and siblings (Media Analysis Laboratory, 1998). Although the video game playing activity sometimes pulls teens from social activities, this proportion is

very small (Media Analysis Laboratory, 1998). Contrary to all of these findings, it was notified that playing computer games has negative effects on 'prosocial behavior' (Anderson & Bushman 2001, 2002; Anderson, 2002; Chory-Assad, 2000).

Yelland and Lloyd (2001) informed that games' solitary nature differs according to the platform used to play the game. To illustrate, it was claimed that, while computer and video games are used by individually, arcade games are generally more social. Through the arcade games and the social environment, girls more likely to participate in competitive games.

In the discussion of cooperative or competitive nature of computer games, which also have potential effects on social behavior, it was maintained that the competitiveness is not a characteristic for all games, rather some games are really cooperative (Prensky, 2001). It was stated that fulfillment of a challenging goal generally requires competition, but not always. More cooperative games which were aimed to improve interpersonal skills are developing recently (Heinich et al. 1996).

2.4.4. Aggression

Violence and aggression considerations are generally perceived as relevant with the computer games, however their effects are not definite yet (Funk, Hagan & Schimming, 1999). It was stated that today's computer games mostly have features of aggression (Provenzo, 1992; Dietz, 1998; Anderson & Bushman, 2001) and the most popular games have violent context (Bartholow & Anderson, 2002).

According to current research studies, violence features of some computer games have a crucial influence upon the children's life. It was found that after experiencing violent games, younger children become more aggressive (Anderson & Bushman, 2001, 2002; Anderson 2002, Bartholow & Anderson, 2002; Chory-Assad, 2000) and this result is independent from gender (Anderson & Bushman, 2001; Bartholow & Anderson, 2002). However more aggression levels were detected from boys than girls (Bartholow & Anderson, 2002; Durkin & Barber, 2002). Chory-Assad (2000) found that for college

students' gender is one of the primary predictors of aggressive behaviors aside from the time spent with violent video games that has less effect. Even though the ratings are not significantly high, players who spent more time with games have the highest scores on the aggression (Durkin & Barber, 2002; Colwell & Payne, 2000; Anderson & Dill, 2000).

In the meta-analysis of 46 studies with three different types examined by Anderson and Bushman, it was provided that, either short term or long term playing video games with violent content have effect on the increased aggression levels related with the people's own 'Internal State' (Anderson & Bushman, 2001, p. 355; Bartholow & Anderson, 2002). However, the majority of the research literature showed that, violent video game playing increases aggressiveness in the short term but the long term effects are questionable (Emes, 1997; Dietz, 1998).

Buchman and Funk contended that, "Violence is primarily a learned behavior, then the powerful combination of demonstration, reward and practice inherent in electronic game playing creates an ideal instructional environment." (Buchman & Funk, 1996, ¶28). They further argued that the effect of game-playing on children have long-term implications on children's behaviors and attitudes (Buchman & Funk, 1996). Anderson supported these belief in that, when people play violent games in long-term, learning may occur and it will be hard to change the settled knowledge after then (Anderson & Bushman, 2001). Dietz further claimed that, violent games "give the impression that violence is an effective and preferable method of problem-solving and for the advancement through the stages of life" besides these are normal for a society. (1998, p. 438)

When considering the perceptions of students, the big proportion of the teenagers, especially girls are in the opinion that video games have negative effects on children (Media Analysis Laboratory, 1998).

As opposed to all of these results, some of the research studies tried to show that there is no association between the violent video games and increased violence in youth (Digital Software Association, 2001; Durkin & Barber, 2002). Rather, during the 10 years

period the video games have been used, the video violence has diminished in the United States. Further evidence was showed that in other countries, whose people play video games also have low youth violence (Digital Software Association, 2001).

From different perspective computer games were supported that, not all of the games have such aggression characteristics (Subrahmanyam, Greenfield, Kraut & Gross, 2001). Furthermore, there is an uncertainty of the relationship between the aggressive behavior of children and the extent of computer game playing (Subrahmanyam, et al, 2001). Another uncertainty is asserted as, for some studies, aggression and 'arousal' were confused (Anderson & Dill, 2000).

2.4.5. Addiction – Confusion of Reality with Fantasy

Aside from violence, there are some other negative effects of computer games were analyzed by the researchers. Two of them are addiction and the confusion of reality with the fantasy. Csikszentmihalyi (1990) cautioned that, participants maybe very much involved in the flow process that there may be problems arise regarding addiction.

When asked whether video games are addictive or not, majority of the sample adolescence stated that it is addictive (Media Analysis Laboratory, 1998). However in the study conducted by Rosas et al (2003), this view was not justified by observing that, students give up playing games in the free times of the courses.

One of the other dangerous effects of computer games is where children lose the line of reality and fantasy (Subrahmanyam, et al, 2001). This will be more apparent as the game generation starts playing computer games as early as 2 years old when they do not recognize what is real and what is not (Prensky, 2001).

2.4.6. Gender -Bias

The last negative effect is the gender-bias. Provenzo indicates that, games also have the potential to teach the culture to players. And since many games have some stereotyped-content, learning such social content would be inevitable (Provenzo, 1992). And due to the negative gender stereotyped content of many popular games, their both social and individual

identities are affected (Dietz, 1998). The mostly depicted stereotype is women are subordinate and helpless. When such a perception is learned via exposure to these games, this may lower the performance of girls (Dietz, 1998) and their aspirations especially in school as well as their perception of others may change.

2.5. The Potential of Computer Games on Students' Learning

The research on whether computer games influence students in a positive way is still not evidential; some findings are providing similar results. Among them, many research studies investigated their effects on students' intellectual, visual, motor skills and also their effects on discovery learning strategies, problem solving skills and computer using skills. Besides all of these skills that are desired when learning in classroom environment, many of these research studies also agreed upon the fact that computer games have a great potential to motivate and engage students that may be the most essential factor for self-directed learning.

2.5.1. Cognitive, Thinking, Learning Skills

When long-term effect of game playing on cognitive learning is considered, Cole (1996) proved that computer games have a positive effect on students learning (Cole, 1996 cited in Subrahmanyam et al. 2001, p.16). According to Gredler, the intellectual skills and 'cognitive strategies' are the ones that are acquired during academic games (1996, p. 525). However, she also stated that, computer games generally require simple skills such as recall of verbal or visual elements rather than higher-order skills (Gredler, 1994). Moreover, these games often have wrong strategies of reinforcement and sometimes provide environments for winning by guessing.

Although provoking computer games as having positive impact on students' learning, Prensky claimed that, especially with the nonstop speedy games, the opportunity for stop and think about the experience and thinking critically is lessened (Prensky, 2001; Provenzo, 1992). Csikszentmihalyi (1990) supported this belief that during an enjoyable activity, not enough time is devoted for thinking and reflection. However, for other genres

of games such as adventure, role-playing, simulation, strategy etc. games, the reflection process time is increased (Prensky, 2001).

2.5.2. Visual Skills

Computer games help processing information through visual representations rather than verbal ones. It was proposed that, there are cognitive development effects of computer games including "spatial representation", "iconic skills", and "visual attention" (Subrahmanyam, Greenfield, Kraut & Gross, 2001 p. 13, Greenfield, 1984 cited in Prensky, 2001 p.45). The repetition of the activities in computer games that utilize some skills may increase the performance on these skills. By this way, with the help of computer games, players find opportunities to develop their skills such as "mental rotation, spatial visualization, utilization of two-dimensional representation of hypothetical space, reading images, keeping track of a lot of different things at the same time" (Subrahmanyam, Greenfield, Kraut & Gross, 2001, pp 13-15; Greenfield, 1984 cited in Prensky, 2001 p.45). According to the study of Greenfield et al. regarding the visual attention of students, the more skilled the players the better attentional skills they have (Greenfield, deWinstanley, Kilpatrick & Kaye, 1994).

Mayer et al. (2002) reported that, in a computer simulation game, when students are provided with visual scaffolding their performance is increased, rather than giving them verbal scaffolding.

2.5.3. Motor Skills

A study reported that games have positive effects on students' motor skill learning. Besides their performances are increased with the time spent with the game (Kawashima et al, 1991). In another study, flight simulator game is tested and results show that it improve the skills required to fulfill tasks (Gopher, Weil & Bareket, 1994).

2.5.4. Discovery Learning - Problem Solving Skills

Rieber noted that contrary to the belief that children games are simple, critical thinking and problem-solving skills are the one that are required to play these computer

games. This meaningful thinking process and effort lead players to acquire useful knowledge (Rieber, 1996). Also, such games enhance skills to make working tentative solutions and meaningful conclusions (Price, 1990), some inductive discovery skills like observation, trial and error and hypothesis testing (Gorriz & Medina, 2000; Greenfield, 1984 cited in Prensky, 2001; Price, 1990) besides several other strategies of exploration (Provenzo, 1992; Prensky, 2001)

To illustrate the problem solving skills positively affected by computer games (Price, 1990), Hong and Lui (2003) indicated that, the problem solving strategies of 'expert' and 'novice' computer game players are different. While novice players use the strategy of 'trial and error' and do not concentrate on the problem and expert players use the strategy of 'analogical- mental processes'. However, Provenzo (1992) noticed that although computer games have a great potential for students' learning some skills, badly designed games may make the reverse effect.

2.5.5. Computer Usage Skills

It is asserted that, playing computer games can provide training opportunities in preparation to computer literacy. (Subrahmanyam, Greenfield, Kraut & Gross, 2001). By examining the areas of using computer games in training, Prensky also reported that they were used to help people gain some familiarity with the computer hardware and in another case, they were used to help people gain especially for using mouse (Prensky, 2001).

In the same way, computer game playing inequality between girls and boys was regarded as a reason of the difference between computer acquisition of boys and girls (Subhrahmanyam & Greenfiled, 1999; Gorriz & Medina, 2000). It is claimed that girls' first experience with the computer is through the computer games, and since the market generally have male-oriented games girls are frustrated and lessen the computer activities besides computer game playing time afterwards. Providing games for also girls was related with the enthusiasm of girls about computer activities as well (Gorriz & Medina, 2000).

2.5.6. Motivation

According to Prensky, "learning takes effort", for this reason, motivation for learning is required for learners to voluntarily participate in the "self regulated" learning process (Prensky, 2001, p. 100; Rieber, 1996; Becker, 2001). Prensky illustrated the two contexts, in one of which, teacher arouses students' motivation, while in the other context, the learning method –game context- is motivating rather than any other extraneous effect (Prensky, 2001). So, games are seen as convenient ways that lead learners to have the responsibility of their own learning and where the learners are intrinsically motivated by the method itself (Rieber, 1996).

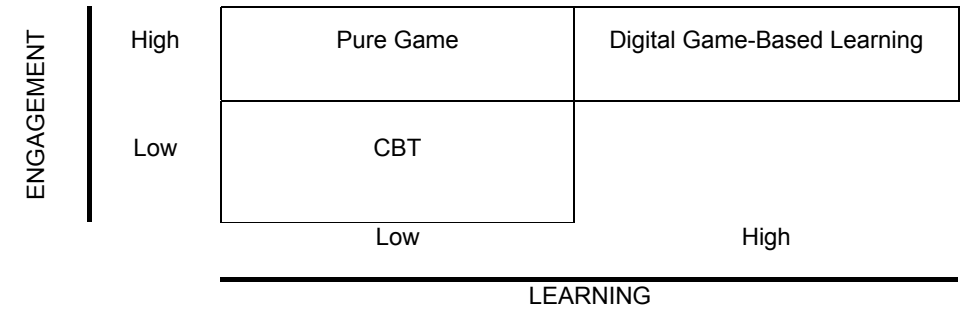
Malone (1980) and Malone and Lepper (1987) defined four characteristics of games that contribute motivation and thus learning. These are challenge, fantasy, curiosity and control. For the challenge characteristic of computer games, as the difficulty level is adjusted, students will not be bored and persist with the activity that has a clear goal. For the fantasy characteristic, appeal imaginary context increased enthusiasm. The curiosity characteristic of the game provides students with interesting, surprising and novel contexts that also stimulate students' needs to learn the unknown. Control characteristics give the learner the feeling of self-determination. With these 'fun' components, students learn willingly and thus better.

In the Flow Theory developed by Csikszentmihalyi, a basis for motivation for learning is supplied and it is stated that flow stage enables psychological growth (1990). Csikszentmihalyi notes that to carry the learner to the flow stage requires a lot of effort however it will be very "rewarding when successful" (Prensky, 2001, p. 125). Since enjoyable activities that enable the flow stage have a relationship with the gaming elements (Rieber, 1996), computer game activity has the potential to carry the learners to the flow stage and thus make students learn better (Prensky, 2001) while increasing their motivation and attainment (Rosas et al, 2003).

2.5.7. Engagement and Interactivity

One of the grounds that ensure the effectiveness of computer game based learning is their engagement and interactivity characteristic (Price, 1990; Prensky, 2001). Different from other leisure time activities, active participation characteristic is the one that games allow for players (Provenzo, 1992; Gredler, 1996). In this interactivity process, feedback is given very much importance on games considering its effect on learning (Prensky, 2001; Malone, 1980; Rieber, 1996; Gredler, 1994).

Prensky explains the Figure 2.1. as; the best learning takes place when there is high engagement. The proposed way to provide "high" level learning is through Digital-Game Based Learning leaving the Computer Based Learning that has low engagement and pure game which has little potential to be effective in learning (Prensky, 2001, p.150). Price also was in the same opinion and stated that if through these games someone learns a significant thing, this is probably "accidental by product of having fun". However, these games maybe somewhat effective in learning "eye-hand coordination, the importance of following directions, and problems solving strategies" (1990, p. 51).



Note. From Marc Prensky: Digital Game-Based Learning. McGraw-Hill 2001 (p. 149) Adapted with permission of the author.

Figure 2.1. The relationship between Digital Game-Based Learning, engagement and learning

When learning through games, interactive learning techniques are applicable. Some of them are: "Practice and feedback, learning by doing, learning from mistakes, goal-oriented learning, discovery learning, task-based learning, question-based learning, situated learning, role playing, coaching, constructivist learning, multi-sensory learning" (Prensky, 2001, p. 157).

However as Price (1990) and Gredler (1996) asserted the games in the market are generally include repetitive activities that overuse drill and practice method of CAI. For this reason, some of the games in the market may have negative influences on students learning strategies. In his diagnostic analysis about the cognitive maps, Kokdemir (1996) reports that when the game path is reversed students made more errors than they made in the routine path when using such repetitive, straightforward games. Coyne (2003) criticized that many computer games require repetitive actions regardless of the genre of games.

2.6. The Perception of Society, Parents and Teachers Toward Play, Computer Games and Learning Through Computer Game Playing

Society influences the perceptions of educators, parents and students as well. Examination of these influences will be crucial to understand the inclinations of different beliefs, opinions and perceptions of educators.

According to Rieber (1996), "Research from education, psychology, and anthropology suggests that play is a powerful mediator for learning throughout a person's life." (p.43). Prensky supported this statement as: "Play has a deep biological, evolutionarily important, function, which has to do specifically with learning." (Prensky, 2001, p.112). Rieber argued that growing technological innovations provide opportunities of interactive learning environments that can be integrated with the theories of learning.

Csikszentmihalyi (1990) defines flow experience as something which increases the performance of people, provide a sense of control, bring them to a new reality, supply them consciousness of discovery, by this way promote the self-growth. In this theory it is possible

to learn while playing and enjoying, which is "challenging, exciting, pleasant, and interesting" (Media Analysis Laboratory, 1998).

However, the "play" countered a lot of misconceptions that may influence its integration into education. These misconceptions can be outlined as: Play is perceived as not serious and respectable thing; play is applicable to only young children; play is easy; play is unrelated with learning; and play is the opposite of work (Rieber, 1996). Contrary to these believes Rieber (1996) supported that play have an important role in the learning and socialization of people as well as actively engage players with challenging tasks. Moreover, he contended that it can be appropriate also for adults (Rieber, 1996; Prensky, 2001). Furthermore, play is not the opposite of work, but the leisure is, and continued as, "Work becomes play when one's job is so satisfying and rewarding." (Rieber, 1996, p. 44) Prensky also supported Rieber in that, play is perceived by many people as 'not serious' and 'unproductive', but this is not generalizable to everyone that many people perceived play as a valuable, powerful and productive part of the learning process.

Prensky further claimed another misconception of many people with a common proverb: " No pain, no gain" and he explained that it is possible and even more effective to learn through fun and play (pp. 109). Conversely, Prensky (2001) asserted that adults generally do not want to play games since they think it takes a lot of time and effort to play game. After replying these misconceptions, Prensky outlined some of the positive impacts of play on learning including the increased creativity, motivation, persistence and supported by Rosas et al. (2003) as increased attention and concentration.

In the Glickman's review of educational history, it was presented that, how people perceive play depends on the educational philosophies of that time, which influence on the policy in the educational systems. So according to these philosophies, the game playing activity can be perceived as something useless in one time, while in another time it can be perceived as something productive and useful. (Glickman C.D. 1984 cited in Rieber, 1996). Moreover it was reminded that, the influence of play on learning requires long-term

evaluation process as Prensky contended. (Glickman C.D. 1984 cited in Rieber, 1996; Prensky 2001)

Regarding the parents' perceptions who have much influence on students' perceptions toward playing computer games, Sneed and Runco (1991) found that, parents share the same positive beliefs with their children about the influences of video games. However, adults rated the video games more negatively when they consider their influence on their children than when they consider their general effect (Sneed & Runco, 1991). Even though parents consider the computer game playing activities as a waste of time, they preferred the time that is wasted with computers than with TV by their children (Kraut, Scherlis, Mukhopadhyay, Manning & Kiesler, 1996). Besides, parents rated computer games more positively than television in the confusion of reality with fantasy and violence issues (Sneed & Runco, 1991).

Lastly, many educators generally perceive recreational computer games as 'time wasters', however they think educational games are important instructional means (Price, 1990, p. 51). Becker (2001) supported Price that although educational games have the considerable respect, entertaining games are perceived as not useful for education and thus academicians pay no attention for them. Academicians think that the game market has few educationally valuable products and in general games are not designed seriously.

In another study, it is presented that the interest of using computer games in courses is declined as the grade level increases due to the perceptions of teachers who think that computer games are effective for mostly elementary school levels (Rieber, 1996). Becker (2001) supported also this findings by concluding that computer games have not perceived much careful attention as an instructional tool but assume very much interest in the elementary schools by teachers.

2.7 Generation Disparity Problem, Lack of Innovation, and Proposed solutions in the Education System

New generation has different needs, learning styles, experiences, interests and outlooks than their instructors, which maybe caused by the possible perception problems of educators. Prensky (2001) outlined some differentiating characteristics that "game generation" possesses resulting from different experiences and "new media socialization" (Prensky, 2001, p.65; Calvert & Jordan, 2001). To explain, this generation has the skill of dealing with large amount of information quickly even at the early ages, and they use alternative ways to get information and finding solutions to their own problems through new communication paths. Also they prefer doing more than one thing at the same time while preferring the use of various paths toward the same thing, rather than linear-steps.

They push themselves into a new situation without knowing anything about it and actively, by trial and error, they prefer learning by themselves rather than reading or listening the exact way. They want to be treated as "creators and doers" rather than "receptacles to be filled with the content" (p.76). So they are referred as "intellectual-problem-solving-oriented generation". Besides as Subrahmanyam et al (2001) described, they are getting more visually empowered rather than text oriented.

Game generation has a positive attitude toward the technology and perceive computers as their friends, as something provides them fun and make them relaxed. As Malone's defined fun components (1980), game generation prefers fantasy contexts that are also compromised by technological innovations.

According to Prensky (2001), there is no wall between work and play; these two can be combined to be more productive for them. He concluded that, that is why Digital-Game-Based Learning is suggested.

Having established the characteristics of new generation, it would be appropriate to state that traditional instruction is not working. The basic reason was showed as the old-generation teachers' unawareness of the new generations' needs and learning styles

(Prensky, 2001). Starting from this point, there are other problems arise. To outline, the ineffectiveness of old-style courses, futile optional methods such as CAI or Web Based Technologies, and stiffness of educational system to modify.

To begin with, one of problems is that courses are boring and unengaging regarding to the games, television because teachers do not apply new methods or variety of paths, but present the content in the same way. Besides, the instructors insistently try to educate new generation by using old, teacher centered or content centered methods that undermines the needs of students (Prensky, 2001). This old method of teaching forces students learn "slowly, step-by-step, one thing at a time, individually, and above all, seriously" (Prensky, 2001b, ¶8).

Prensky further explained that, neither through CAI, nor through web based technologies used for instruction contributes to learning, rather they subtract. People do not want to be included in such learning "opportunities" provided with innovative technologies because they have nothing more than the same boring content and same old boring strategy as traditional education (2001, p. 93)

Although new approaches are developed, education system is "slow to change" to accommodate them and furthermore since there is no agreement of "how people learn" (Prensky, 2001, p.77), the great modification in education system is difficult and requires time. Other restrictions that limits the change is money restrictions, unawareness of the characteristics and needs of new generation, not knowing how to take actions, the system features as big system, bureaucratic problems, necessity of extra work, and not knowing how to measure the process oriented new system etc.

To eliminate these problems, Yelland and Lloyd notified instructors: "What is done in schools needs to be viewed in relation to society and with reference to what is meaningful or relevant in the lives of young people." (2001, p. 191) and they should not ignore the impact of computer games as a way to promote learning of new generation. Otherwise, with an obsolete curriculum instructors will lose their 'credibility as professionals in the

information age' and also children will be vulnerable to the game market that want to sell their products regardless of their effects on children (Yelland & Lloyd, 2001, p. 177)

2.8 The Use of Computer Games in Education

It is claimed that, computer games can be used in all grade levels and all subject areas (Gredler, 1994; Prensky, 2001). However, there are some considerations that educators have to be careful about.

First of all, educators should make a comprehensive investigation in a broad perspective to determine whether to use computer games in their courses or not. Regarding this investigation, Gredler (1996) warned that there are many problems educators have to consider before integrating computer games into education. Firstly, there are many gaps and wrong methodologies in the conducted research studies in this issue. According to her, previous research studies tried to compare traditional instruction with educational games, however she strongly objected by "the instructional goals for which each can be most effective often differ"(p. 521). Moreover these studies were criticized for ignoring the students' characteristics that may affect their choice of instruction. Also they did not report the instructional process during the application of computer games. Furthermore the patterns of content- student and student-student interactions are also not documented. Due to all of these flaws of previous research studies, it will be risky to take action regarding these studies.

Another gap is in the theory and paradigms of the instructional field. Due to lack of theory and design paradigms for educational games, designed games may have accommodate a lot of potential negative effects on students. For this reason, Gredler gave notice the educators about these inappropriate games. Price (1990) was on the same opinion with Gredler (1996), and further he maintained that games in the market are generally based on drill and practice type that have straightforward rules and require repetition.

Provenzo (1992) claimed that games soon will be integrated in to education and for this reason, educators must be cautious about the possible effects of these games such that "...video games are programmed type of teaching tool, circumscribed and limited by the technology of computers and the social content of the game scenarios on which they are based. They are neither neutral nor without social and educational impact." (p. 32).

After considering all of these warnings and drawbacks, if instructors want to use computer games in their courses, firstly outcomes and learning activities should be determined to locate the best game style for teachers' aim (Prensky, 2001). According to Gredler, when choosing games for classroom use, deep structure ('psychological mechanisms operating in the exercise') of the game should be considered carefully (1996, p. 522). Regarding the deep structure, the winning strategy of the game should not be by luck; rather winning strategy should require students' use of their knowledge, and mental skills acceptable for the subject area and beyond the game setting.

When these prerequisites are satisfied for the selected games, Gredler prescribe the purposes for using these games in classrooms as: "

1) to practice and/or refine knowledge/skill already acquired

2) to identify gaps or weaknesses in knowledge or skills

3) to serve as a summation or review

4) to develop new relationships among concepts and principles."

In addition to these, Gredler (1994) also proposed that games could be used as a reward for students.

It was advised that since most of the computer games are not designed for the entire teaching-learning process, they are generally used in combination with other methods that include teacher (Prensky, 2001). Prensky reported that K-12 children plays digital games generally at home or in schools and he thinks that the ratio is nearly 95 percent at home, and 5 percent in school (Prensky, 2001). This also can be an indication that many people think the games as not proper for schools. Prensky provides a logic of J. Kernan that asserts that,

since the restricted time in schools, computer games should be used at homes, and if students play those games in homes they will sacrifice other activities according to their choices but this will be fun for the students. And Prensky is also in the same opinion as the best solution for students to experience digital game –based learning is at their home.

Heinich et al. (1996) outlined the applications of computer games as, using them for helping students fulfill 'cognitive objectives', motivating students for dull subjects, learning with a group without teachers, improving vocabulary, developing "basic skills such as sequence, sense of direction, visual perception, number concepts and following rules" (p. 328).

2.9. Teachers' Perspectives and Use of Computers in Their Courses, and Their Potential of Changing the Current Situation

Although trend in the use of computers in education is changing rapidly, it is apparent that computers are not used as effectively as possible (Grabe & Grabe, 1998; OTA, 1995). According to a study, teachers' estimations of time spent with computers did not match with the students'. While teachers stated that they use them on average, 1,75 hours at the elementary level, 2 hours at the middle school level, and 3 hours at the secondary level, students estimated that 24 minutes, 38 minutes and 61 minutes of engagement time with computers relatively (OTA, 1995, p. 102). Another study showed that about half of the practicing teachers do not use computers in their courses at all while preservice teachers think that they will use it more (Marcinkiewicz, 1995).

As for the instructional use of computers; they are used to teach content, help students to learn using computers and as a tool to perform other school related work. However the aim of using computers differ according to grade levels. OTA (1995) reported that secondary level students mostly use computers as a tool. It was stated that, they are widely used to teach computer literacy and other programs and much of the computer use time of students are for learning computer literacy rather than learning content from

computer, while elementary level students mostly used them to learn content area (OTA, 1995). The use of computers for different subject matters was reported as 9 % for English, 6,7% for mathematics, 2-3% social studies or science.

It was argued that teachers utilize computers for helping students to learn factual knowledge, practice or learning how to use computers but not for "higher-order thinking and problem solving" (Grabe & Grabe, 1998, p. 19). The OTA (1995) study reported that elementary school teachers generally make use of computers for students to work on drill-practice of basic skills, and playing instructional games – "rather than in a productivity mode, using computers as a tool to solve problems or create products" (p. 104)

> 53 percent of 5th graders said that they used school computers to play games on 10 or more occasions during that school year, while 13 percent said they did word processing. Similarly, about 65 percent of 5th-grade teachers report that computers in their classes are mainly used for language arts skills practice and games, while 18 percent say they are used primarily for writing and word processing; about 17 percent report both categories of use (OTA, 1995, p. 105).

In spite of having access to computers in schools, most of the teachers do not utilize it effectively in their courses (Office of Technology Assessment [OTA], 1995). Some factors were outlined to conceptualize why computers and other technologies were not used more as: "availability, time and differences among teachers in their attitudes toward change and technology" (OTA, 1995, p. 131).

In terms of availability, Lunenburg and Ornstein (1996, p. 209) were in opinion that, 'limited resources' is one of the problem that make teachers to resist any new implementations. Besides, it was reported that the computerization in schools is growing rapidly, however not all of these computers have enough quality and power to be integrated in courses as intended (OTA, 1995; Grabe & Grabe, 1998). Furthermore, access rates do not guarantee that students are using the computers (Grabe & Grabe, 1998).

Considering time devoted to learn new technology and keep up with the innovations, teachers rated this lack of time drawback as the most deterministic one for not using computers in their courses (OTA, 1995). Similarly regarding the 'knowledge and skill obsolesce' Lunenburg and Ornstein stated that, when a new technology is to be used by the personnel, they resist that their old knowledge will be obsolete and resist that they need to learn new, complex system (p. 208, 1996). Besides some of the teachers feel concerned due to time restrictions to complete regular curriculum materials and when there is no time left for technology utilization (OTA, 1995).

Another reason for not using computers effectively in courses is teachers' attitudes and opinions. While some teachers are open to innovations, enthusiastic to apply new things, others are not. As counting the required things to change and learn, the enthusiasm of the most of the teachers diminishes. Although many teachers have access to computers and have time, they do not know how to use it to make instruction more beneficial (OTA, 1995; Heinich, Molenda, Russell & Smaldino, 1996; Whetstone & Carr-Chellman, 2001). Some teachers also feel anxious that, they may lose their authority as described in another study namely as : 'threats to power and influence' (Lunenburg & Ornstein, 1996, p. 208; Grabe & Grabe, 1998) issue. While teachers have the power and control in their regular system, they resist a change that will disrupt their power. In addition to this, teachers fear that computers will replace themselves (Carbonaro, 1997).

Another resistance is 'Fear of unknown' (Lunenburg & Ornstein, 1996, p. 207). While teachers established a stabile system for themselves by knowing how to be successful, changes in this system will require teachers to learn new things and require them to modify their system to succeed. In many studies, it was stated that nearly half of the preservice teachers do not have skills to use technology for better students' learning (Grabe & Grabe, 1998). However, teachers' use of computers in their courses were found to be influenced by their computer training education and their 'competency' (Dusick & Yıldırım, 2000). When

considering the preservice teachers, the study showed that they have over confidence considering the 'actual practice' (Whetstone & Carr-Chellman, 2001, p. 15).

As for Turkey, teachers have positive attitudes toward the use of computers in classrooms and they gave importance of using it. Their defined barriers for not using computers were: lack of availability, inappropriateness of instructional programs and the lack of skills of teachers about using them (Çağıltay et al, 2001). However, the study conducted by Whetstone and Carr- Chellman (2001) in another country showed that, although given importance, preservice teachers are not enthusiastic about computers.

Considering the teachers' potential of changing the education system, there are both negative and positive perceptions. Some argued that teachers have little impact of changing the 'policy decisions' and for this reason, their use of computers changing according to schools' policy, not because their own decisions (Sutton, 1991, p. 482). However Grabe and Grabe (1998) contended that teachers have the power of the way of using technology, supported by Whetstone and Carr-Chellman (2001) who claimed that preservice teachers have the responsibility of changing the use of technology. On the other hand, in bureaucratic school organization, it is hard to realize innovations (Lunenburg & Ornstein, 1996).

2.10. Synthesis

Prensky is of the opinion that games are "culture and age" specific (Prenksy, 2001, p. 138). Even though this is the case it seems that many students from all countries and from all ages, like playing computer games and prefer such kind of learning experience. As the growing number of people from all ages who play computer games, there is not a study to report the importance of computer games in the lives of teachers or prospective teachers. Similarly, their game playing habits and previous experiences with games are not examined either.

Considering the potential of computer games in students' learning, it would be evidential to estimate that, teachers' perceptions of using computer games in education

would be in the positive direction. However statistics did not support this by presenting low integration levels of computers in courses (OTA, 1995). Regarding the way of using computer games in education issue, although there are theoretical advices, the empirical studies to prove these opinions are not mentioned.

In conclusion, although there is some amount of literature about computer games and their effects on students' learning, there is a very critical gap in the literature about the teachers' and prospective teachers' game playing characteristics and their perceptions about using computer games in education.

CHAPTER 3

METHODOLOGY

This chapter presents the overall design of the study, participants, data collection instruments, data collection procedure, data analysis procedure, limitations and the delimitations of the study.

3.1 Overall Design of the Study

This study was aimed to investigate;

- the computer game playing characteristics of prospective computer teachers, who have been studying at the Computer Education and Instructional Technology (CEIT) departments of different universities,
- the perceptions of subjects toward the use of computer games with educational features in education,
- the future plans of subjects regarding the use of computer games with educational features in their courses or in learning environments which they will design.

The design of the methodology corresponds to the above purpose.

The present study was designed as a survey research study that can be seen as the starting point of many other research studies. Having the major purpose of portraying the

perceptions of prospective teachers toward the use of computer games in education, this study will have the potential to be a base study for different types of future research studies as well.

3.2. Sampling

3.2.1. The Sample

Table 3.1. Descriptions and numbers of participants

UNIVERSITY YEAR/ SEMESTER NO	GENDER				Total #	Total %
	F #	F %	M #	M %		
Ankara University						
4/7	0	0	1	0,86	1	0,86
4/8	10	8,62	11	9,48	21	18,10
Sub-Total	10	8,62	12	10,35	22	18,96
Gazi University						
4/8	11	9,48	11	9,48	22	18,96
Sub-Total	11	9,48	11	9,48	22	18,96
Hacettepe University						
4/8	15	12,93	20	17,24	35	30,17
Sub-Total	15	12,93	20	17,24	35	30,17
METU						
3/5	1	0,86	1	0,86	2	1,72
3/6	6	5,17	27	23,28	33	28,45
4/8	1	0,86	1	0,86	2	1,72
Sub-Total	8	6,90	29	25,00	37	31,90
Total #	44	37,93	72	62,07	116	100

The participants consist of 4th year students who study at the Computer Education and Instructional Technology (CEIT) departments of three universities (Ankara University, Gazi University, Hacettepe University) and third year students who study at the CEIT department of the Middle East Technical University. The sample size is 116. This number is acceptable to conduct survey studies. (Fraenkel & Wallen, 1996, p.106)

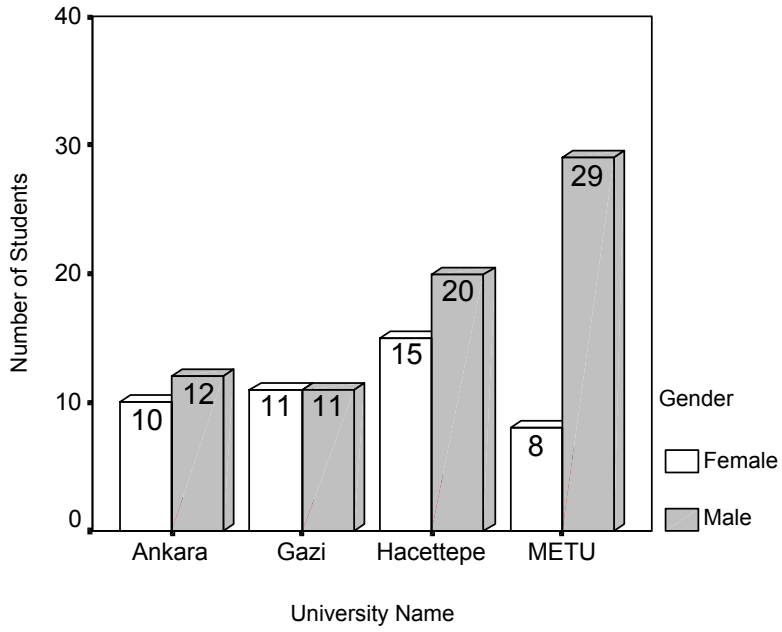


Figure 3.1. Number of students from different universities and gender

As can be seen in the Table 3.1. and Figure 3.1. males represented the majority of the sample (nearly 62 %), while girls were in the minority (38%). In terms of age, students' ages were in the range of 20-25 with the mean of 22,1 (SD: 0,91). There were equal number of students (22) in both Ankara and Gazi University samples, although the different number of girls and boys in each one. Hacettepe and Middle East Technical University samples had nearly equal number of students (35, 37 relatively). The difference between these university sample distribution is that, while Hacettepe sample has similar number of students from both gender, in the METU this proportion was in favor of males (29 males, 8 females).

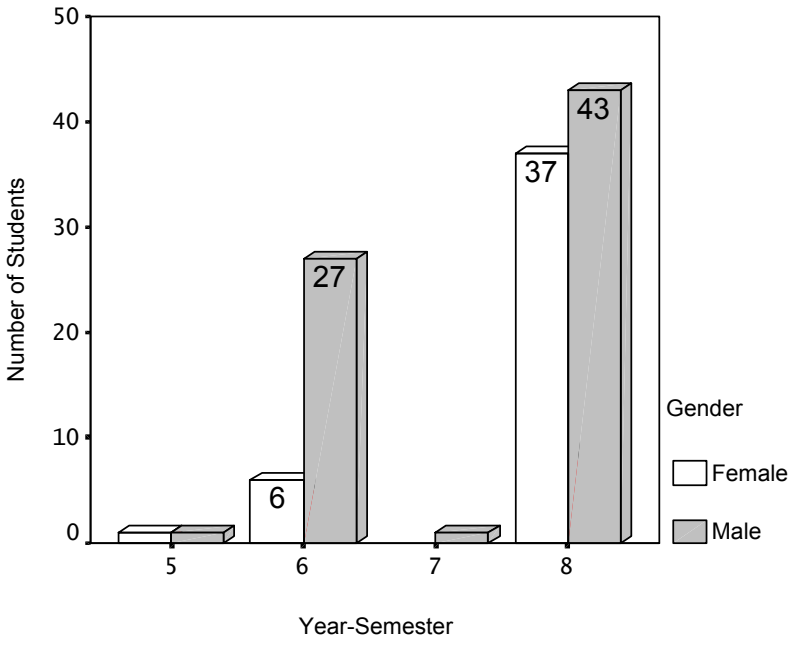


Figure 3.2. Number of students from different semesters and gender

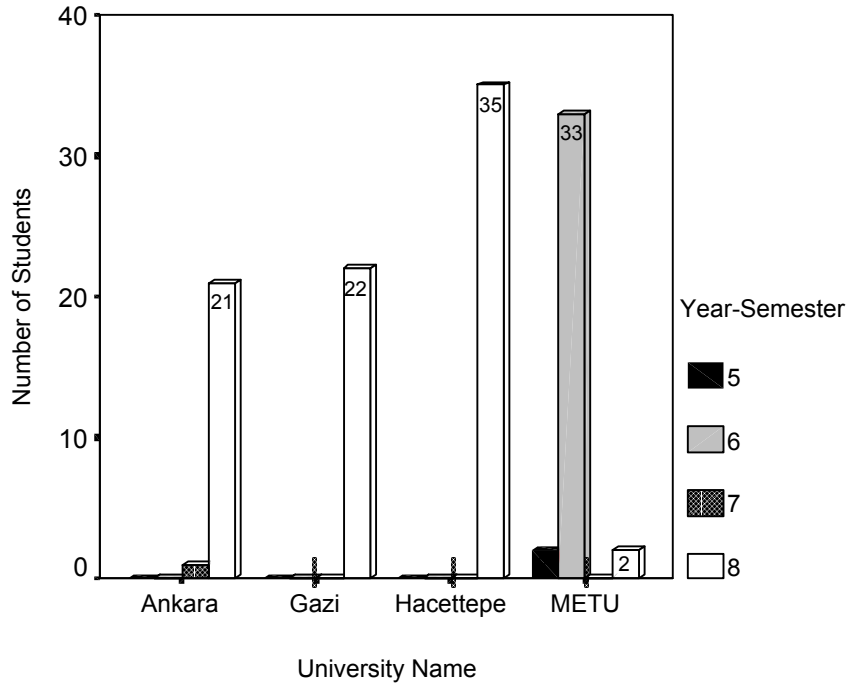


Figure 3.3. Number of students from different semesters and universities

Considering the semester, 80 students were in their eighth semester of the fourth year and 33 students were in their sixth semester of the third year. Since the data were collected from fourth year students in the three universities (Ankara, Gazi, Hacettepe), and third year students from the METU, fifth and sixth semester students were only in this university, besides 2 students in their eighth semester.

The differences in the visions of the CEIT faculty of different universities have to be considered as well. While Ankara University Computer Education and Instructional Technology department has more instructors from social background, Gazi University has more instructors with technical background according to university web sites. Although the courses are generally the same for four universities, the optional courses in Gazi University are mostly technical issues. The Middle East Technical University CEIT department also considered as technical since the technical background of the university which gives importance to the engineering departments like Hacettepe University.

3.2.2. Sample Selection Procedure

Two-phase non-random sampling methods were used to select participants for this study. Firstly, by using convenience sampling method, students from four universities in Ankara participated in this study, due to their proximity to the researcher.

Secondly, purposive sampling method was used to form a group from the previously selected convenience sample. This last group is purposively selected as the fourth year students in three of these four universities, regarding the researcher's personal judgment. According to the researcher, fourth year CEIT students are better representatives of the "prospective computer teachers" not only because they have more experience than the others in the lower year levels, but also because they were experiencing internship in that semester. The third year CEIT students from the fourth university, METU, were selected to participate in the study because the fourth year CEIT students in METU had previously participated in the pilot study. To include representative samples from different universities, third year

CEIT students from METU were also included in the final sample. Moreover, third year METU CEIT students also had school experience courses. All students in these preexisting groups were intended to be included, rather than randomly selecting students among them.

Regarding the interviews, the sampling procedure included a third phase non-random selection. Four voluntary students (two male and two female students) who were completed the questionnaire were selected from each different university to be interviewed.

3.3. Instrumentation

Two survey instruments were used to collect data by a combination of two self-reporting systems: A questionnaire and an interview schedule.

3.3.1 Questionnaire

This written response type instrument was designed to get objective answers from participants by generally providing them with structured answering patterns. It was aimed to be administered to all selected participants. For this reason, it was the major device to collect data from the predetermined sample.

It is composed of mainly two parts have to be completed by the participants. Part I represents both the demographic characteristics and computer game playing characteristics of the subjects. Part II basically has questions that aimed to investigate the subjects' perceptions toward the use of computer games with educational features in education. There are totally 58 questions (Part I: 37 questions, Part II: 21 questions) in the questionnaire.

Because the language of instruction is in Turkish in three universities (Gazi, Hacettepe, and Ankara), the questionnaire was prepared in Turkish considering the subjects' characteristics.The questionnaire is composed of representative questions regarding to the research questions as indicated in the Table 3.2.

As seen in the Table 3.3, the majority of the questions are in the form of four point Likert type which include agreement statements as: Strongly Disagree, Disagree, Agree, and

Strongly Agree. Neutral or Undecided options are not included in this likert scale due to the tendency of subjects to select these choices without deeply thinking about the question as in the case of pilot study.

Table 3.2 Content of the questions in the questionnaire, regarding to research questions

Reference to the Research Questions	Content of the Questions	Question no.	Question#
	Demographic characteristics	Part I: 1-7	7
Research Question 1	Subjects' access to computer games	Part I: 8-12	5
	Subjects' previous experience with games	Part I: 13-17	5
	Subjects' current experience of games in terms of time spent with computer game playing among other leisure time activities	Part I: 18-23	6
	Subjects' general perceptions toward computer game playing	Part I: 24-35	12
	Subjects' preferences of games and game types	Part I: 36,37	2
Research Question 2	Subjects' perceptions toward the use of computer games with educational features, in the curricula.	Part II: 1-5	5
	Perceptions of subjects in terms of capabilities of computer games with educational features, in helping students to fulfill the educational learning goals which are defined in the schools' curricula.	Part II: 6-8	3
	Perceptions of subjects in terms of the way computer games with educational features, should be used in education to be more effective in students' learning.	Part II: 9-19	11
	Perceptions of subjects in terms of how students and teachers think of the use of computer games with educational features in education.	Part II: 21	1
Research Question 3	The future plans of subjects regarding the use of computer games with educational features in their courses or in learning environments that they will design.	Part II: 20	1
			Total: 58

Table 3.3. Types of questions in the questionnaire

Types of Questions	Question no.	Total #
Four point Likert type questions (Agreement Scale)	PartI: 24-35, PartII: 1-19	31
Multiple Choice Questions	PartI: 4,5,9-17	11
Short Answer Questions	PartI: 1,3,6,7,36	5
Six Point - Rating scale	Part I: 18-23	6
Dichotomous Questions	Part I: 2, 8	2
Open ended Questions	Part II: 20,21	2
Selecting and ordering type	Part I: 37	1
		Total: 58

This likert scale is used to investigate the questions that represent the perceptions toward computer games and the use of computer games in education. There are 11 multiple choice type questions that represent both categorical and continuous variables. The choices of some questions are determined with the help of the pilot study results. This type is used to investigate the subjects' previous experience of games as well as their access to computer games. Short answer type questions are generally aimed to get demographic fact information from the subjects, such as age, cumulative grade point average, the year and the semester of studying at the university etc. Six point rating scale questions are used to provide students with choices that represents the extent of time they spend for some leisure time activities. Dichotomous questions that investigate the gender and possession of a computer can be encountered in the questionnaire, whose answers are in two-choice format as: female/male, no/yes. There are two open-ended questions in the last part of the questionnaire. The first one investigates the plans of subjects regarding the use of computer games with educational features in their future professional life. The second question is in a pictorial form that represents the classroom environment in which students are playing computer games and teacher helps them. Filling in the thought balloons is the response method. Due to its

answering method, the last type of question can be described as selecting and ordering type. It requests subjects to select their preferences of game types and want them to order these preferences and write the orders with numbers next to their game type preferences.

Development of the Questionnaire- Procedures to Ensure Validity of the Instrument

Since the lack of existing questionnaires that aim to investigate the perceptions of teachers or university students who are studying at educational faculties, toward the use of computer games in education, the present questionnaire was developed by the researcher. Although some questions were inspired from an existing questionnaire developed by Squire and Jenkins (2003), the majority of the questions were developed regarding the literature about computer games in education.

However, since the content of this study is new to experts and also new to the subjects, pilot studies were conducted to support the content validity of the questionnaire. Besides, due to the awareness of the fact that, newly developed questionnaires have problems that will affect the internal validity of the research and the results, several tests were administered to ensure instrument validity of this questionnaire.

The procedure:

1. Development of the questionnaire.
2. First pilot study with 45 participants who meet the characteristics of subjects of this research.
3. Revision with the help of experts from CEIT department, Turkish Language department and Academic Writing Center in the METU. Translating English version into Turkish.
4. Second pilot study with 12 participants who meet the characteristics of subjects of this research by using think-aloud protocol.

5. Third pilot study with 10 participants, 5 of them are research assistants of CEIT department in METU and 5 of them are master/doctorate students of CEIT departments of METU. Think aloud protocol was used.
6. Examination of the questionnaire by experts in the Computer Education and Instructional Technology field. Revisions were made.

1. *Development of the Questionnaire*

The first form of questionnaire was developed regarding to the literature review (Prensky, 2001; Malone, 1980) and existing questionnaires developed for different purposes (Squire & Jenkins, 2003; Media Analysis Laboratory, 1998; Tzeng, 1999). All the sources that the researcher inspired from were research studies conducted in different countries except Turkey. The language of the questionnaire was in English.

2. First Pilot Study

The first pilot study was in an experimental research design. For two weeks, 90 minutes for each week, 45 fourth year Computer Education and Instructional Technology students from the Middle East Technical University were exposed to different types of computer games. Two questionnaires were administered each week. During the administration period, subjects stated that some of the questions were not clear, they could not provide choices that they want to select and the questions were not easy to understand. Besides they asked meanings of some English words.

The results of the pilot study revealed that, students generally selected the "Neutral" option of the five point Likert scale. Moreover, some of the students left some of the questions without answering. For multiple choice questions some of the students selected the "other" option and wrote their own choices.

3. Revision with the help of experts from different expertise and Translation

After the pilot study, two parts of the questionnaire were combined and questions that didn't match the research questions were excluded. With the help of the pilot study,

problematic questions were modified into more understandable wording, some words were replaced with their synonyms, and more options were added to the questions that the subjects in the pilot study selected "other" option. "Neutral" option was excluded from the five-point likert scale and replaced with four-point likert scale.

After all these revisions were completed, the English form of the questionnaire was examined by a faculty member of the CEIT department, METU. Revisions were made according to his advice.

Then, it was translated into Turkish by the researcher. In case of any wrong statement of the questions due to translation, the questionnaire was examined and some modifications were advised by the Academic Writing Center in METU. Moreover, due to the meaning deterioration caused by the translation, it was examined and some modifications were advised by a faculty member of the Turkish Language Department of the METU.

4. Second pilot study

The second pilot study was conducted with 12 participants who were fourth year Computer Education and Instructional Technology students, some of whom had participated in the first pilot study. They were invited to participate in this study. The new form of questionnaire was administered individually by using think-aloud method. The questions that were not understood, poorly and unclearly worded, and misleading were revealed and modified. While completing the questionnaire, they were also asked questions about what they understand from some of the questions, especially the questions that were designed to investigate the perceptions of the subjects. Having all the responses and determining the defected points in the questionnaire, some revisions were made.

5. Third pilot study

The third pilot study was administered to 5 research assistants and 5 MS/ Ph.D. students. They were asked to detect the questions that were not understood and misleading. According to their advices some modifications were made.

6. Examination of the questionnaire by experts

The improved form of questionnaire was handed in four faculties of the Computer Education and Instructional Department at METU. Three-point scale was provided for each question for them to determine whether the question should be removed from, modified, or remain same in the questionnaire. According to their advices some modifications were made.

After these steps in developing the questionnaire, it was administered with the pre-determined subjects from four universities.

Reliability of the Questionnaire

In the internal consistency estimates of reliability analysis of the questionnaire several methods were administered to confirm the reliability while holding the assumptions that "every item is assumed to be equivalent to every other item", and "an item score is a sum of its true and its error scores" (Green, Salkind & Akey, 2000, pp. 305-306). Reliability analysis of different sections (See Table 3.4.) and combination of these sections were also calculated (See Table 3.5), because the questionnaire is not unidimensional and there are different types of questions in the questionnaire (Green, Salkind & Akey, 2000). Moreover, the sample size is not convenient to calculate Coefficient Alpha for the entire questionnaire.

For this reason, after some pre-analysis steps described in the 'Data Analysis' section like transformation and conversion of scores into z-scores, three sections are extracted to conduct these reliability analysis while excluding the demographic information section (questions 1 to 7 in the Part I), access to computer games section (questions 8 to 12 in the Part I), some of the leisure time activity questions (questions 21-23 in the Part I) and other different response type questions (questions 36, 37 in the Part I; 20 and 21 in the Part II).

Table 3.4. Descriptions and question numbers of sections that reliability analysis were conducted upon.

Sections	Description	Question no.	Total #
Section 1	Experience with games.	Part I: 13-20	8
Section 2	General perceptions toward computer game playing	Part I: 24-35	12
Section 3	Perceptions toward the use of computer games with educational features in education.	Part II: 1-19	19
			Total: 39

Table 3. 5. Reliability analysis results: Alpha Coefficients of different sections and combinations

	α coefficient	%	# of questions
Section 1	0,79	79	8
Section 2	0,64	64	12
Section 3	0,85	85	19
Section 1 & Section 2	0,77	77	20
Section 1 & Section 3	0,87	87	27
Section 2 & Section 3	0,84	84	31
Section 1 & Section 2 & Section 3	0,87	87	39

As reported in the Table 3.5., Coefficient Alpha is higher than 0,60 indicates that the scores are sufficiently reliable for the sample. Regarding the section about the students' experience with games, about 79% of the "total score variance" is due to "true score variance" (Crocker & Algina, 1986, p. 139). However, in the section two which is about the general perceptions of subjects toward the computer game playing, only 64% of the total score variance can be explained by the true score variance. The alpha reliability coefficient is much higher (0,85) in section 3 that includes items related with the perceptions toward the use of games with educational features in education. Considering the combination of

different sections, the reliability coefficient is getting higher. This may be due to the fact that the test is not unidimentional although the scores were converted into z-scores.

3.3.2. Interview Schedule

According to the researcher's personal thought, although some quantitative methods were used mainly as the basis of this research study, a complementary aid was still required to investigate the perception of the subjects. Because the researcher believed that there is a critical necessity of details and flexible responses about the perceptions of the respondents. For this reason, personal open-ended structured interviews were conducted. They were more comprehensive in that, the respondents weren't bounded with rigid answering structures when explaining their ideas and feelings. By this way, their responses on the questionnaire were complemented by their explanations in this method while providing some extra information for the direction of further research studies. These two instruments were aimed at for triangulation support of the reliability and validity of the study.

The advantage of this interview schedule was that, the researcher clarified any questions that were not understood; besides she could request extended answers and responses against superficial answers.

The interview schedule was composed of four main questions some of them included options and sub-questions followed by these options. Besides there is one entrance question, which is not in fact a question but a statement to make participants think a little before answering the main questions. So, all of the students, who participated in the interview, agreed with the entrance question. One of them stated, "As a prospective computer teacher, with the help of the knowledge that I acquire from the courses, from outside knowledge, from books that I examined, I also agreed with many people that these games can be useful in education". [E2- Appendix F]

Although the questions were stated explicitly in the interview schedule, the interviewer was also free to explain the questions with her own informal explanations when

the respondent could not understand the question or stated unrelated things. For this reason, the alternative questions, which were posed during the interview, were more flexible than the main questions. The whole questioning-answering pattern was followed according to respondents' answers. The questions in this pattern were asked in the corresponding order as shown in the Appendix B. Besides structured questions, respondents were also directed some further explanation questions.

The content of the questions were designed to reveal the explanations of the answers given in the questionnaire and the answers expected by this interview were consistent with the research questions (See Table 3.6).

Table 3.6. Interview questions and their content

#	Content of the Interview Questions
Entrance	The educational features of computer games.
1	Contribution of computer games with educational features to students' learning, advantages and disadvantages of their usage in education.
2	Appropriateness of the usage of computer games with educational features in the curricula.
3	The effective way of usage of the computer games with educational features in education/courses.
4	Future Plans about using the computer games with educational features in education.

Development of the Interview Schedule

The interview tested with individuals from different backgrounds about computer games, and from different demographic characteristics to ensure that the questions were meaningful, understandable, unambiguous, and not leading questions (See Table 3.7). The pilot studies for the interview schedule were not recorded.

Table 3.7. Descriptive information about the participants in the pilot study of Interview Schedule

Description of Participants	#
Fourth year CEIT students from METU	10
Research Assistants	5
Computer Literacy Teachers	2

Having various view-points from these participants, the contingency questions in the interview had been modified. After these revisions, the schedule was presented in the paper format to two instructors from the CEIT, METU. Further modifications were made to prepare the interview schedule ready to use.

3.4. Data Collection Procedure

3.4.1. Administration of the Questionnaire

The data were collected from 116 students during the end of the spring semester 2003 in three-day period by using the questionnaire described in the instrumentation section with the permission of the regular instructors. From each three universities (Ankara University, Gazi University and Hacettepe University) the data were collected from fourth year Computer Education and Instructional Technology students with direct administration to the subjects. The data were collected from the third year Computer Education and Instructional Technology students of the METU. The response rates were as high as 100%.

The researcher herself collected the data from all four universities. The time of administration of the questionnaire varied according to the subjects' regular course schedule. The data were collected during their regular course hours that they attend during the semester (See Table 3.8). So, the specific times of collecting data were changed according to four different university course schedules as shown in the table. The questionnaires were

administered just at the beginning of their regular courses. The beginning of the lecture hour was selected intentionally, so that their attention would be better focused than the duration at the end of the lecture. No time restrictions were given to the students. On average they completed the questionnaires in 10 minutes.

The locations were again differed according to the four universities, but the questionnaires were all administered in their regular classrooms they attended during the semester.

Table 3.8. Detailed information about the administration of the questionnaire

University Name	Time of Administration	Instructors	Location
Middle East Technical University	13 May Tuesday 2003 Time: 13.40	Instructor	-electronic-classroom -cool -moderately roomy
Ankara University	14 May Wednesday 2003 Time: 14.00	Instructor	-computer laboratory -cool -roomy
Gazi University	15 May Thursday 2003 Time: 9.10	Instructor	-computer laboratory -cool -roomy
Hacettepe University	15 May Thursday 2003 Time: 13.30	Prof.Dr.	-lecture classroom -cool -small

The purpose of the research and the directions for questionnaire was conveyed verbally by the researcher before they were given the questionnaires or before starting the interview (Appendix C). Also four students were selected among voluntary students for the interview.

Throughout the administration of the questionnaire, the researcher was present in the classroom to answer any problems or questions of the subjects. The procedure by which the

data were collected was aimed to be standardized in order to decrease the implementer internal validity treat.

3.4.2. Administration of the Interviews

In the Middle East Technical University, four students interviewed after their instructor give some short lecture, and after the questionnaire. In Ankara University, the interviews were conducted just after the administration of the questionnaire like in Gazi University and Hacettepe University.

Each interview took average of nearly 7,7 minutes for each respondent and nearly 130 minutes in total. The location for conducting interview schedule was all different places as presented in the Table 3.9, but generally silent and isolated places.

Table 3.9. Detailed information about the administration of the Interview Schedule

University Name	Time of Conducting Interview	Interview Location
Middle East Technical University	13 May Tuesday 2003 Time: 14.15 – 15.10 (At the end of the lecture)	-meeting room -silent, cool, roomy -alone
Ankara University	14 May Wednesday 2003 Time: 14.30- 15.20 (Just after the administration of the questionnaire)	-computer laboratory -moderately silent, cool, roomy -not alone, with four students in the laboratory.
Gazi University	15 May Thursday 2003 Time: 10.00- 10.45 (Just after the administration of the questionnaire)	-instructor's room -silent, cool, roomy -alone
Hacettepe University	15 May Thursday 2003 Time: 14.00- 14.30 (Just after the administration of the questionnaire)	-lecture classroom -silent, cool, roomy -alone

At the beginning of each interview, the researcher greeted them with a warm manner by stating her thanks to participate in that interview. Prior to recording the conversations, the researcher explained the items presented in the Appendix B. Since the aim of the study was announced to the subjects in the introduction part of the questionnaire, it was not repeated at the beginning of the interview. However, the explanations made about the aim of the interview, the time the interview would take and the privacy of the responses. Besides, the permission was requested to record the interview period (Appendix C).

During the interviews, the researcher acted positively toward the respondents smiling in respective way. The researcher didn't read the questions on the interview schedule not to lose eye contact. To show that she was tracking and understanding what they explained, she nodded her head and sometimes stated that she understood what they said. Also the researcher carefully listened them to give an impression of that, their responses were really important.

The sequence of the questions was not changed, but just for two respondents it was re-sequenced. Some questions were somewhat academic, but the alternative questions that were asked when they did not understand were in conversational, informal style. When needed, the researcher asked extra "could you explain/clarify more" type questions or repeat the question in different way. Interview sessions were recorded.

3.5. Data Analysis Procedure

The data analysis procedure includes two main phases: Descriptive statistical data analysis and qualitative data analysis. Also reliability analysis is also provided in this part.

3.5.1. Data Entrance and Pre-Analysis Operations

For data collected from by the help of the questionnaire, first, the variable names and variable types were determined (nominal, ordinal, or scale) and variables were created. Then the data were coded into SPSS program by using generally numbers for the options of the

questions that have more than one option. A code number was assigned to each respondent, which identifies students with numbers and the initial character of the university name, such as first respondent from the Ankara University was identified by A-1. For other universities, these initials were used: Gazi University (G), Hacettepe University (H), Middle East Technical University (M). Besides, the participants in the interview was indicated by additional letter, I (Example: AI-1 represented Ankara University participant who was interviewed as well as filled the questionnaire)

After coding multiple choice and likert scale type questions, the items that required different types of responses were coded differently. To begin with the question 9 in the Part I of the questionnaire two additional choices were coded, according to responses written in the 'others' choice, which are "in work place" and "in friends' places". Since more than one option can be selected by the subjects, one participant have more than one frequency contribution to the overall frequency of each different place where they use computers.

Other questions that have different data coding process were the questions 36 and 37 in the Part I, which are game and game type preferences questions. In question 36, according to responses, each game name was given a code number and then coded. Because the same situation of selecting more than one option was the case, one participant have more than one frequency contribution to the overall frequency of each different game. Then mostly preferred games were differentiated by using descriptive analysis.

In question 37 the problem faced during the coding data was that, many students wrongly responded the question. While question required students to rank their mostly preferred game type, 26 (28,9%) participants out of 90 who selected some of the game type options did not provide any rank and only selected their preferred game types. Besides the remaining 26 participants selected 'I do not play games' option. Since the data analysis would be defected, this question was analyzed by using the same method described for the question 36.

Also some other modifications were made on the data for the question 7 of Part I. Cumulative GPA of Ankara University was converted to 4-scale from 100-scale.

3.5.2. Descriptive Analysis

For categorical variables, the frequencies were calculated to describe the results of the study. Moreover, percentages were calculated and the mode for each categorical variable was revealed. By using SPSS, bar charts were provided to better illustrate the general view of these variables, regarding their frequencies. Mode and median representations were provided as well.

For quantitative or continuous variables, again frequency distributions and percentile ranks were used. Some statistical indices were computed as "measures of central tendency" (mean, median, mode), "measures of variability" (standard deviation). Graphical forms were also utilized.

3.5.3. Reliability Analysis

Before conducting reliability analysis, for some variables, the scale were reversed and recoded in another variable, because these variables were in opposite directions that the researcher wanted to investigate (Question numbers: 25,29,33,35 in Part I). Also the missing questions were managed by using "series mean" method in the SPSS which replace the mean values of the whole data in a variable with the missing values in that variable data. The mean values were coded in integer numbers by rounding the mean number (See Table 3.10). Due to the fact that some items in the questionnaire have different metrics, the data of the variables were standardized by converting in to Z-scores in different variables.

Table 3.10. Missing fields detected in the questionnaire data for only quantitative data entry

Question no.	Subjects	Replaced with	# of missing
p1-q4	AI-3, G-19	3	2
p1_q16	M-26	4	1
p1_q20	HI-2	1	1
p1_q21	HI-1	3	1
p1_q25	M-14	3	1
p1_q27	M-16	3	1
p1_q29	HI-3	2	1
p1_q33	H-29	3	1
p1_q35	H-33	3	1
p2_q2	HI-3	3	1
p2_q13	G-20	3	1
			Total: 12
Total : 6264 field.	Empty: 12 field.		Percentage Empty: 0,19

3.5.4. Qualitative Data Analysis

Qualitative data analysis was conducted regarding the content analysis explained by Yıldırım and Şimşek (2000) as: The data were coded, themes were found, the data were organized and defined according to the codes and themes, and interpretations were made. This process was also described by the steps of Miles and Huberman (1994) as 'data reduction', 'data display' and 'conclusion drawing and verification' (p. 10). To illustrate further in detail, for interview raw data, transcribed records were organized according to research questions firstly. Then they were summarized into shorter statements. Themes were determined and the statements were coded regarding these themes. The answers obtained during the interview sessions were tabulated and frequency information was provided along with this qualitative data. For the open-ended type questions in the Part II- question 20,21, the same procedure was used.

3.6 Limitations

- The intended sample was not accessed completely due to the absence of some of the subjects during the data collection day. If they were there, they might give different responses. So, this consideration limits the generalizability. Furthermore, the researcher has no evidence that those missing subjects were similar to those remaining on pertinent characteristics.
- Some of the participants failed to complete all of the questions in the questionnaire. This can be another validity threat. It was possible that the results would have been changed, if all of the subjects may have completed the questionnaire.
- There could be many extraneous variables that might have effect on the results of this study during the data collection. Such as during the questionnaire and interview the locations were all different. The location characteristics were different in terms of the room of the classes, lighting, heating, ventilation etc.
- The validity and the reliability of this study limited to the honesty of the participants' responses to the instruments used in this study. There may be problems of accuracy and reliability stemming from memory limitations and inaccurate estimations on the part of respondents of self-report answers both in the questionnaire and in the interview.
- Since the facts are changing relative to individuals and the environment they are involved, repeatability is not possible even though the conditions are similar for the interviews (Yıldırım&Şimşek,2000). For this reason, any repeated study may not give the same results as this study.

3.7 Delimitations

- Regarding the sampling, the data were collected from third year students from METU. In other universities the participants were the fourth year students. Also the numbers of students in each of these universities are different. This could affect the results of the study.

- Even though the researcher tried to standardize the procedure of data collection, there could be some differences in the experimenter treatment toward subjects during the administration of the questionnaire and the conduction of the interview schedule.
- In the interview, the study might not include much variability in responses because of limited respondents number. So, this may limit the comprehensiveness of conclusions drawn from the analysis of the interviews.
- All of the pilot studies were not conducted with enough participants and as a result this may restrict the validity and the reliability of the study.
- The researcher had no training for conducting interviews, so may have lack of skills. Besides, since the researcher have positive tendencies toward the questions in the interview, she might lead the respondents unintentionally during alternative questions which are posed when respondents misunderstand the question or when they give unrelated answers in the interview schedule. However this is a very rare case.

CHAPTER 4

RESULTS

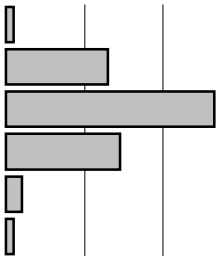
This chapter demonstrates the findings regarding the research questions of the study. Firstly the descriptive information that was gathered through the questionnaire will be presented. Then, computer game playing characteristics of subjects will be outlined followed by the explanation of the perceptions of subjects toward the use of computer games with educational features in education. In the last part, responses given to the open-ended questions in the questionnaire and responses given by the informants who were interviewed will be reported.

4.1. Some of the Demographic Characteristics of Subjects

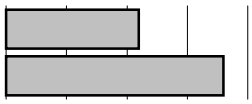
The age of the participants ranged from 20 to 25, though 93 % of them were between 21 and 23 (Table 4.1). The mean age was 22,1 (SD: 0,91). The group was homogenous in terms of age. Of the 116 subjects, the majority of the group was male. Totally, there are 72 males (62%) and 44 females (38%) (proportion of 1,6).

Ankara, where the data were collected, was the highest rated city that subjects were born (20%), followed by Antalya (5,2 %). The results were highly heterogeneous in that; there are 54 different responses (75% other than Ankara and Antalya). Besides Turkey, two subjects (1,7 %) were indicated they were born in foreign countries.

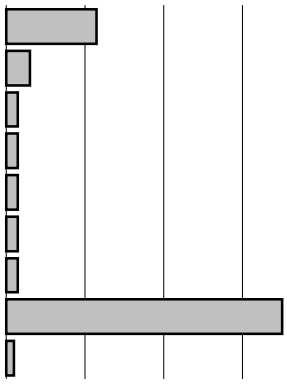
Table 4.1. Age, gender, birthplace and income descriptive information

	F	%	Frequency bar graph
P1-Q1) AGE			
20	2	1,7	
21	26	22,4	
22	53	45,7	
23	29	25,0	
24	4	3,4	
25	2	1,7	

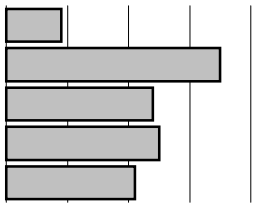
Missing: 0 Mean: 22,11 SD: 0,91

	F	%	Frequency bar graph
P1-Q2) GENDER			
Female	44	37,9	
Male	72	62,1	

Missing: 0 Mode: Male

	F	%	Frequency bar graph
P1-Q3) BIRTH PLACE			
Ankara	23	19,8	
Antalya	6	5,2	
Izmir	3	2,6	
Kayseri	3	2,6	
Mersin	3	2,6	
Yozgat	3	2,6	
Zonguldak	3	2,6	
Other Cities in Turkey	70	60,3	
Foreign Country	2	1,7	

Missing: 1 Mode: Ankara

	F	%	Frequency bar graph
P1-Q4) INCOME (in million TL)			
Less than 150	9	7,8	
150-200	35	30,2	
200-250	24	20,7	
250-300	25	21,6	
More than 300	21	18,1	

Missing: 2 /1,7% Mean: 3,12 Nearly: 200-250 SD: 1,26

Considering the income of the subjects in million Turkish Lira, the mean is nearly 200-250. While 'less than 150' was selected least (7,8%), other choices were rated in similar amounts with the percentages of 32% for 150-200 million TL, 21% for 200-250 million TL, 22% for 250-300 million TL, and lastly 18% for more than 300 million TL option.

Table 4.2. University name, semester and cumulative GPA descriptive information

		F	%	Frequency bar graph
P1-Q5)	UNIVERSITY			
	Ankara Univ.	22	19,0	
	Gazi Univ.	22	19,0	
	Hacettepe Univ.	35	30,2	
	METU	37	31,9	
Missing: 0	Mode: METU			
		F	**%**	**Frequency bar graph**
P1-Q6)	SEMESTER			
	5	2	1,7	
	6	33	28,4	
	7	1	0,9	
	8	80	69,0	
Missing: 0	Mode: 8			
		F	**%**	**Frequency bar graph**
P1-Q7)	CUMULATIVE GPA			
	Less than 2,49	16	13,8	
	2,50- 2, 99	49	42,2	
	3,00- 3,49	42	36,0	
	More than 3,5	9	7,8	
Missing: 0	Mean: 2,92 SD: 0,39			

There were 22 (19%) subjects who participated in the study from Ankara University and equal number of students from Gazi University. Hacettepe and Middle East Technical University also have similar number of students of 35 and 37 (30 % and 32%) relatively. As

can be seen there was an unequilibrium in the number of students from different universities with the proportion of 1,6 considering the two group of universities (See Table 4.2.).

Regarding the semesters, subjects were generally in their sixth and eighth semesters. Since data were collected from third year students of one university (METU) and fourth year students from other universities, the majority of the students (71%) were in their fourth year including the students of the METU who were also in their fourth year, while the remaining 29% were in their third year and all of them were METU students.

Cumulative Grade Point Average scores were in the range of 2,06 to 3,90, with mean of 2,92 and standard deviation of 0,39. The highest percentage was gathered between CGPA of 2,5 and 3,5 (about 78%). Only 8 % of the subjects have cumulative GPA of more than 3,5.

4.2. Subjects' Computer Game Playing Characteristics

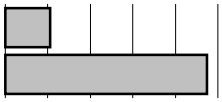
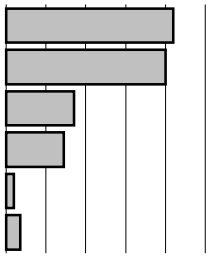
4.2.1. Subjects' Access to Computer Games

Greater number of subjects reported that they had their own computers (82%), while the computer usage places differed (See Table 4.3). Since more than one answer was allowed to be selected for the computer usage place question, total number of selection was 238. Regarding the percentages calculated according to the number of respondents, 72% of which use computers at home, 69% in university department computer laboratories, 29% at Internet Café, 25% in dormitories. Workplace and friends' place options, which were the choices proposed by the subjects for the 'other' response option, were the least favored options (Totally 9,5%). The percentages are lessened considering the total number of selection. According to the percentage of responses of 238, totally 70% of subjects selected that they use computers at home and in university computer laboratories.

Considering the computer game playing opportunity access, subjects chose that, they have full permission to play computer games (41%) where they use computers mostly. 28% of subjects informed that they do not play computer games, so there is not such an issue

about permission. Totally 42% of subjects who selected some of the options rather than 'do not play', have some restrictions from others when they play computer games although the amount of restriction differed, while 58% of the computer game players reported that they have full access (Table 4.4).

Table 4.3. Computer access information

		F	%	T%	Frequency bar graph
P1-Q8)	HAVE COMPUTER				
	No	21	18,1		
	Yes	95	81,9		
Missing: 0	Mode: Yes				
		F	**%**	**T%**	**Frequency bar graph**
P1-Q9)	WHERE USE COMPUTER				
	Home	84	72,4	35,3	
	Univ. Computer Lab.	80	68,9	33,6	
	Internet Café	34	29,3	14,3	
	Dormitory	29	25,0	12,2	
	Work Place	4	3,45	1,7	
	Friends' place	7	6,03	2,9	
	Total:	238			
Missing: 0	Mode: Home				

Note. % is calculated using the subject size (116) represents the percentage of subjects who selected that option, T% is calculated using the total number of responses (238) represents the percentage of the response among other 238 responses.

Technical capabilities of accessible computers to play computer games rated highly positively with either enough (66%) or enough for some games (32%) summed up to total percentage of 98%. Only 2% of the respondents have an access to computers without game playing capabilities.

In terms of subjects having computer games, 20% stated that they do not have any game. As majority (39%) of the subjects picked the option 'less than 5', 22% rated the

option ‘5-10 games’, 15 % rated the option ‘more than 20’ games. The mean nearly corresponded to having 5-10 games, but the standard deviation was high, and the range was wide (See Table 4.4).

Table 4.4. Computer game playing access rates

		F	%	Frequency bar graph
P1-Q10)	HAVE PERMISSION TO PLAY COMPUTER GAMES			
	No, never	5	4,3	
	Seldom	14	12,1	
	Sometimes	7	6	
	Usually	9	7,8	
	Yes, always	48	41,4	
	I don’t play	33	28,4	
Missing: 0	Mode: Yes, Always			
		F	**%**	**Frequency bar graph**
P1-Q11)	TECHNICAL CAPABILITY			
	No, not enough	2	1,7	
	Yes for some games	37	31,9	
	Yes, enough	77	66,4	
	I don’t know	0	0	
Missing: 0	Mode: Yes, enough			
		F	**%**	**Frequency bar graph**
P1-Q12)	COMPUTER GAME #			
	None at all	23	19,8	
	Less than 5	45	38,8	
	5-10	25	21,6	
	10-15	4	3,4	
	15-20	2	1,7	
	More than 20	17	14,7	
Missing: 0	Mean: 2,72 SD: 1,60			

4.2.2. Subjects' Previous Experience with Games

As illustrated in the Table 4.5., subjects were acquainted to computers at the mean age of nearly 15, but the majority of them (70%) started using computers at the age of 15-20 and followed by 10-15 years old with 24%. While only 3,5% of subjects first used computers before 10 years old, 1,7% of subjects reported that they started to use computers after 20 years old.

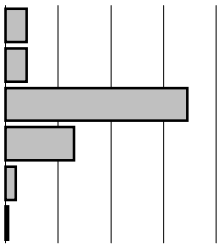
Regarding the computer games, the mean age of starting playing computer games was around 15-20 years old (60%), which is also the mean age of starting using computers. Similarly 10-15 years old was the option selected secondarily (22%) for beginning playing computer games. Seven percent of subjects responded as 'over 20 years old', and same proportion of subjects rated that they did not play computer games at all (See Table 4.6.).

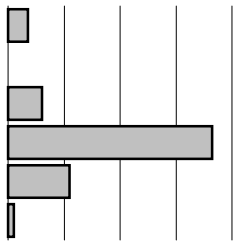
Unlikely, starting playing games on other platforms distribution was favored the '10-15 years old' option with the 63% (also it was the mean), while 19% of subjects reported that they first played games on other platforms around the age of 5-10 which is more than the rating for computer games for that age (3,4%). 10% of the subjects chosen the age of 15-20 and none of them selected the option of 'above 20'. Nearly the same number of subjects (6%) rated that they did not play such games, similarly as reported for the computer games (See Table 4.6.).

Table 4.5. Subjects' previous experience with computers

		F	%	Frequency bar graph
P1-Q13)	AGE OF STARTING USING COMPUTER			
	Over 20 years old	2	1,7	
	Between 15-20 years old	82	70,7	
	Between 10-15 years old	28	24,1	
	Between 5-10 years old	3	2,6	
	Younger than 5 years old	1	0,9	
	Missing: 0 Mean: 2, 30 SD: 0,59			

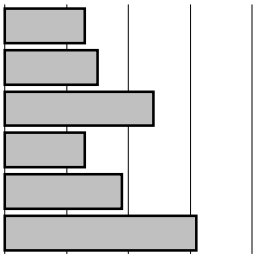
Table 4.6. Subjects' previous experience with games: Age of starting to play

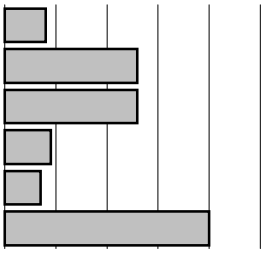
		F	%	Frequency bar graph
P1-Q14)	AGE OF STARTING PLAY. COMPUTER GAM.			
	I didn't play computer games at all.	8	6,9	
	Over 20 years old	8	6,9	
	Between 15-20 years old	69	59,5	
	Between 10-15 years old	26	22,4	
	Between 5-10 years old	4	3,4	
	Younger than 5 years old	1	0,9	
	Missing: 0 Mean: 3,11 SD: 0,88			

		F	%	Frequency bar graph
P1_Q15)	AGE OF STARTING GAME PLAYING ON OTHER PLATFORMS			
	I didn't play such games at all	7	6,0	
	Over 20 years old	0	0	
	Between 15-20 years old	12	10,3	
	Between 10-15 years old	73	62,9	
	Between 5-10 years old	22	19,0	
	Younger than 5 years old	2	1,7	
	Missing: 0 Mean: 3,94 SD: 0,95			

Subjects' extent of spent time for playing games distribution also differed according to the platform. As 35 % of subjects selected the option of 'more than 8 years spent for playing games on other platforms', fewer subjects (27%) rated their spent time with computer games as 'more than 8 years'. The amount of time spent 'less than 4 years', again higher for other platform game playing time (45%) relative to the computer game playing time (34%). The rating was doubled in favor of computer game playing considering the time interval of 4-7 years (14% for games on other platforms, 28% for computer games) (See Table 4.7.)

Table 4.7. Subjects' previous experience with games: Extent of time playing games

		F	%	Frequency bar graph
P1-Q16)	EXTENT OF TIME PLAYING COMPUT. GAM			
	I don't/didn't play computer games at all	13	11,2	
	Less than 1 year	15	12,9	
	2-3 years	24	20,7	
	4-5 years	13	11,2	
	6-7 years	19	16,4	
	More than 8 years	31	26,7	
	Missing: 1 / 0,9% Mean: 3,90 SD: 1,73			

		F	%	Frequency bar graph
P1-Q17)	EXTENT OF TIME PLAYING GAMES ON OTHER PLATFORMS			
	I don't/ didn't play such games at all	8	6,9	
	Less than 1 year	26	22,4	
	2-3 years	26	22,4	
	4-5 years	9	7,8	
	6-7 years	7	6,0	
	More than 8 years	40	34,5	
	Missing: 0 Mean: 3,87 SD: 1,79			

4.2.3. Subjects' Current Experience of Games in terms of Time Spent Among Other Leisure Time Activities

From the general inspection of the Table 4.9, the most popular leisure time activities for subjects were, using computers excluding the school work, and participate in social activities (Nearly 5-10 hours), considering the means and medians presented. Secondly preferred activities were watching television and reading non-assigned books. Playing computer games and games on other platforms had the minimum ratings among the other leisure time activities, although mean hours of playing computer games exceed the mean hours of playing games on other platforms.

Regarding the details, about 29% of the subjects spent 1 to 5 hours, and nearly 28% of the subjects spent more than 15 hours a week using computer while only 1,7 % of subjects reported that they do not use computers at all except school work. Nearly 17% proved out to be using computers about 5 to 15 hours a week. (See Table 4.8.)

Table 4.8. Subjects' current experience of games in terms of time spent, among other leisure time activities

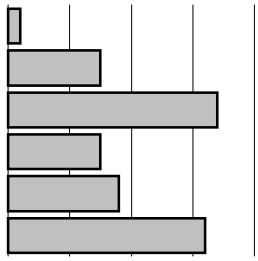
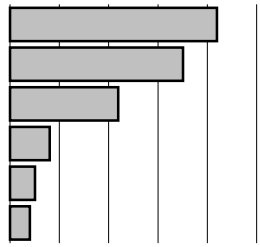
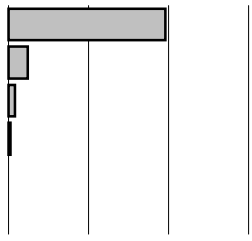
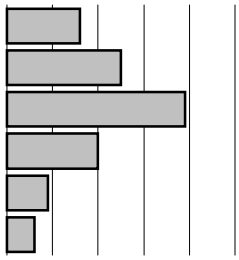
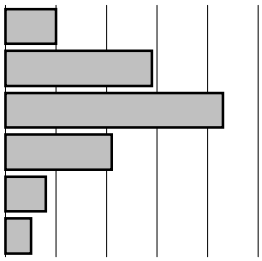
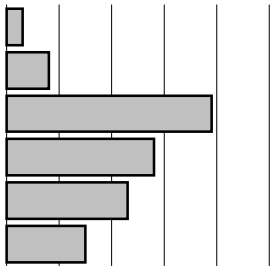
Currently, generally how many hours a week do you		F	%	Frequency bar graph
P1-Q18	use computer (except school work)			
	Not at all	2	1,7	
	Less than 1	15	12,9	
	1-5	34	29,3	
	5-10	15	12,9	
	10-15	18	15,5	
	More than 15	32	27,6	
P1-Q19	play computer games			
	Not at all	42	36,2	
	Less than 1	35	30,2	
	1-5	22	19,0	
	5-10	8	6,9	
	10-15	5	4,3	
	More than 15	4	3,4	
P1-Q20	play games on other platforms			
	Not at all	98	84,5	
	Less than 1	12	10,3	
	1-5	4	3,4	
	5-10	1	0,9	
	10-15	0	0	
	More than 15	0	0	
	Missing	1	0,9	

Table 4.8. (Continued)

Currently, generally how many hours a week do you	F	%	Frequency bar graph
P1-Q21 watch television			
Not at all	16	13,8	
Less than 1	25	21,6	
1-5	39	33,6	
5-10	20	17,2	
10-15	9	7,8	
More than 15	6	5,2	
Missing	1	0,9	
P1-Q22 read non-assigned books			
Not at all	10	8,6	
Less than 1	29	25,0	
1-5	43	37,1	
5-10	21	18,1	
10-15	8	6,9	
More than 15	5	4,3	
P1-Q23 participate in social activities			
Not at all	3	2,6	
Less than 1	8	6,9	
1-5	39	33,6	
5-10	28	24,1	
10-15	23	19,8	
More than 15	15	12,9	

The distribution was reversed considering the game playing time of the subjects. 36% declared that they did not play computer games at all. The percentage of non-players was higher in the case of games on other platforms (85%). While 50% reported that they play computer games less than 5 hours a week, the percentage for other game platforms were 14%. The results documented that, as only 1% of the subjects played games on other platforms longer than 5 hour a week, this proportion for computer games was as high as 15% (See Table 4.8.).

After the computer usage, second most popular leisure time activity was documented as participating in social activities with the mean of 5-10 hours a week (24%), although the mode was 1-5 hours (34%). The majority of the participants rated this activity as they spent time with about more than 5 hours a week (57%) (See Table 4.8.).

After computer usage and social activities, the latter two popular activities was revealed as watching television and reading non-assigned books The mean was 1 to 5 hours a week with the percentage of 34 and 37 respectively. The percentages of subjects who did not allocate time for either of these activities were higher for the former (14%) than the latter (7%). So, more subjects reading books than watching television, although the extent of time varied. 30% of the subjects spent more than 5 hours a week for each of these activities. Besides, the number of subjects who spent more than 15 hours a week watching television was slightly higher than the ones that read books (5,2% to 4,3%).

Table 4.9. The mean, median and mode representations of leisure time activities

Currently, generally how many hours a week do you;		Mean	SD	Mean Explan.	Mode	Median
P1-Q18	use computer (exc. sch. work)	4,10	1,49	~5-10 h.	1-5 h.	5-10 h.
P1-Q19	play computer games	2,23	1,31	~ less than 1h.	Not at all	less than1h.
P1-Q20	play games on other platforms	1,20	0,53	~ not at all	Not at all	Not at all
P1-Q21	watch television	2,99	1,32	1-5 h.	1-5 h.	1-5 h.
P1-Q22	read non-assigned books	3,03	1,20	1-5 h.	1-5 h.	1-5 h.
P1-Q23	participate in social activities	3,91	1,25	~ 5-10 h.	1-5 h.	5-10 h.

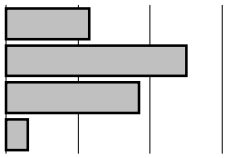
4.2.4. Subjects' General Perceptions Toward Computer Game Playing

Considering the acceptance of computer games as an important leisure time activity (question 24), the subjects tended to choose disagree options (63%) while the remaining 37% of subjects picked agree options including the subjects who selected the strongly agree option of 5,2% (See Table 4.10)

There is an indecisiveness observed when the mean score of the question 25 which investigated whether subjects think playing computer games as a waste of time or not. The mean score is between agree and disagree options, even though the median and mode central tendencies favored the disagree options. However, the percentages and the bar graph representation depicted that, there was not a difference between these two discrete options (50% disagree, 49% agree, 1% missing).

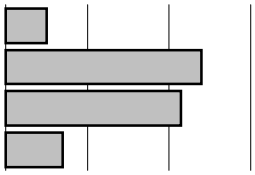
With reference to the required time (question 26), most of the subjects (85%) were on the same opinion that, playing computer games requires too much engagement time; while only 15% selected the opposite choice. The central tendency scores were also in accordance with the percentages (See Table 4.10).

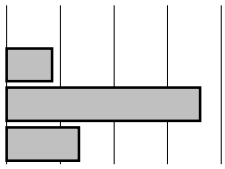
Table 4.10. Subjects' general perceptions toward computer game playing-Time

	F	%	Frequency bar graph
P1-Q24) Playing computer games is an important leisure time activity.			
Strongly Disagree	23	19,8	
Disagree	50	43,1	
Agree	37	31,9	
Strongly Agree	6	5,2	
Missing	0	0	

Mean: (2,22) ~Disagree Median: Disagree Mode: Disagree

Table 4.10. Subjects' general perceptions toward computer game playing-Time (Continued)

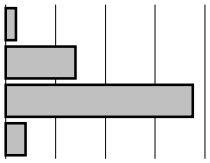
	F	%	Frequency bar graph
P1-Q25) Playing computer games is a waste of time.			
Strongly Disagree		8,6	
Disagree	48	41,4	
Agree	43	37,1	
Strongly Agree	14	12,1	
Missing	1	0,9	
Mean: ~ (2,53) Between Disagree and Agree	Median: Disagree	Mode: Disagree	

	F	%	Frequency bar graph
P1-Q26) Playing computer games requires too much engagement time.			
Strongly Disagree	0	0	
Disagree	17	14,7	
Agree	72	62,1	
Strongly Agree	27	23,3	
Missing	0	0	
Mean: (3,09) ~ Agree	Median : Agree	Mode: Agree	

As for the question 27, which tried to define the subjects' perceptions about the effect of computer games on students' stimulated curiosity to learn something, 27% disagreed against 72% agreed supported with the positive central tendency results (See Table 4.11).

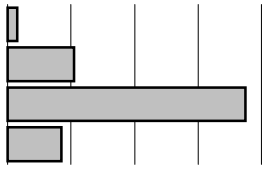
With respect to the question 28, the percentages revealed that subjects tended to agreed that playing computer games helps developing some useful knowledge and skills (80%) rather than disagreed (20%) (See Table 4.12).

Table 4.11. Subjects' general perceptions toward computer game playing-Curiosity

	F	%	Frequency bar graph
P1-Q27) Playing computer games stimulates curiosity in learning something.			
Strongly Disagree	4	3,4	
Disagree	28	24,1	
Agree	75	64,7	
Strongly Agree	8	6,9	
Missing	1	0,9	

Mean: (2,76) ~ Agree Median: Agree Mode: Agree

Table 4.12. Subjects' general perceptions toward computer game playing-Learning

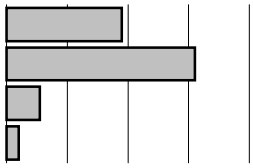
	F	%	Frequency bar graph
P1-Q28) Playing computer games helps developing some useful knowledge and skills.			
Strongly Disagree	3	2,6	
Disagree	21	18,1	
Agree	75	64,7	
Strongly Agree	17	14,7	
Missing	0	0	

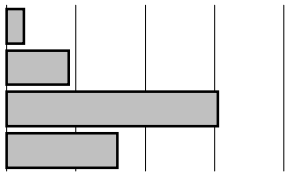
Mean: (2,91) ~ Agree Median: Agree Mode: Agree

In the questionnaire questions 29 and 30 were asked to determine subjects perceptions of what age is suitable to play computer games, either for younger ages only or for all ages. The graphical descriptions showed that the distribution is the same but just flipped with similar amount of ratings. For the former question, subjects determined on the disagree options (86%) rather than agree options (13%); mean that they did not think playing computer games activity is just for younger children. Instead they favored that this activity is

suitable for every age group with 80% agreement against 20% disagreement (See Table 4.13).

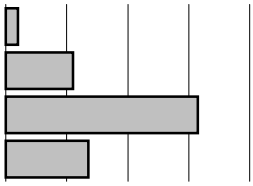
Table 4.13. Subjects' general perceptions toward computer game playing-Age

	F	%	Frequency bar graph
P1-Q29) Playing computer games is suitable for only children (elementary&secondary school).			
Strongly Disagree	38	32,8	
Disagree	62	53,4	
Agree	11	9,5	
Strongly Agree	4	3,4	
Missing	1	0,9	
Mean: (1,83) ~ Disagree	Median: Disagree	Mode: Disagree	

	F	%	Frequency bar graph
P1-Q30) Playing computer games is suitable for every age group.			
Strongly Disagree	5	4,3	
Disagree	18	15,5	
Agree	61	52,6	
Strongly Agree	32	27,6	
Missing	0	0	
Mean: (3,03) ~Agree	Median: Agree	Mode: Agree	

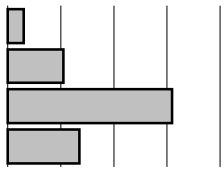
Gender differences in preference of computer game types perceived as existed (78%) against 22%, confirmed by the central tendency scores (Table 4.14). The addiction characteristics of the computer games find a way in the results with 77% agreement. The remaining proportion (23%) disagreed by informing that playing computer games has not such an effect of causing addiction (See Table 4.15).

Table 4.14. Subjects' general perceptions toward computer game playing-Gender

	F	%	Frequency bar graph
P1-Q31) Girls and boys prefer playing different types of computer games.			
Strongly Disagree	4	3,4	
Disagree	22	19,0	
Agree	63	54,3	
Strongly Agree	27	23,3	
Missing	0	0	

Mean: (2,97) ~ Agree Median: Agree Mode: Agree

Table 4.15. Subjects' general perceptions toward computer game playing-Addiction

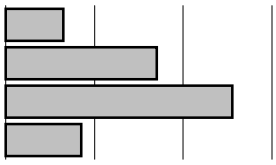
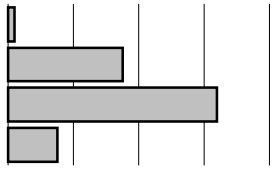
	F	%	Frequency bar graph
P1-Q32) Playing computer games causes addiction.			
Strongly Disagree	6	5,2	
Disagree	21	18,1	
Agree	62	53,4	
Strongly Agree	27	23,3	
Missing	0	0	

Mean: (2,95) ~ Agree Median: Agree Mode: Agree

Connected two questions, 33 and 34, asked the effect of playing computer games on social life of players. The first question investigated the existence of negative effects of it; while the second question asked the importance of games on development of social skills when played with a group of people. For both of them the central tendency scores were proved out to be agreement with the expressions. In detail, 59% and 68% agreed for first and second expressions respectively. Nonetheless the mean score of the latter expression was

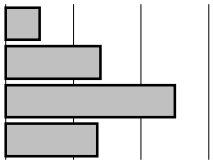
higher than the former one showed that they have a little positive perception toward the second expression (See Table 4.16).

Table 4.16. Subjects' general perceptions toward computer game playing-Social life

	F	%	Frequency bar graph
P1-Q33) Playing computer games affects the social life of people negatively.			
Strongly Disagree	13	11,2	
Disagree	34	29,3	
Agree	51	44,0	
Strongly Agree	17	14,7	
Missing	1	0,9	
Mean: ~ Agree (2,63)	Median: Agree	Mode: Agree	
	F	%	Frequency bar graph
P1-Q34) When computer games are played with a group (friends, family), it helps development of social skills of people.			
Strongly Disagree	2	1,7	
Disagree	35	30,2	
Agree	64	55,2	
Strongly Agree	15	12,9	
Missing	0	0	
Mean: (2,79) ~ Agree	Median: Agree	Mode: Agree	

When effects of the violent games were questioned, 66% of subjects agreed, in contrast 43% disagreed with the negative effects of these kind of games, confirmed by the mean and mode representations (See Table 4.17).

Table 4.17. Subjects' general perceptions toward computer game playing-Violence

	F	%	Frequency bar graph
P1-Q35) Playing violent games affects people negatively.			
Strongly Disagree	10	8,6	
Disagree	28	24,1	
Agree	50	43,1	
Strongly Agree	27	23,3	
Missing	1	0,9	

Mean: (2,82) ~ Agree Median: Agree Mode: Agree

Table 4.18. Cross Tabular representation of subjects' general perceptions toward computer game playing

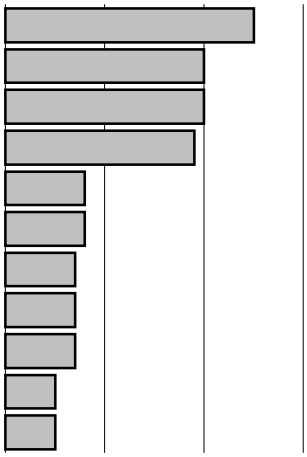
	Strongly Disagree		Disagree		Agree		Strongly Agree		Missing	
	F	%	F	%	F	%	F	%	F	%
P1-Q24) Playing computer games is an important leisure time activity.	23	19,8	50	43,1	37	31,9	6	5,2	0	0
P1-Q25) Playing computer games is a waste of time.	10	8,6	48	41,4	43	37,1	14	12,1	1	0,9
P1-Q26) Playing computer games requires too much engagement time.	0	0	17	14,7	72	62,1	27	23,3	0	0
P1-Q27) Playing computer games stimulate curiosity in learning something.	4	3,4	28	24,1	75	64,7	8	6,9	1	0,9
P1-Q28) Playing computer games help developing some useful knowledge and skills.	3	2,6	21	18,1	75	64,7	17	14,7	0	0
P1-Q29) Playing computer games is suitable for only children (element&second. level)	38	32,8	62	53,4	11	9,5	4	3,4	1	0,9
P1-Q30) Playing computer games is suitable for every age group.	5	4,3	18	15,5	61	52,6	32	27,6	0	0
P1-Q31) Girls and boys prefer playing different types of computer games.	4	3,4	22	19,0	63	54,3	27	23,3	0	0
P1-Q32) Playing computer games leads to addiction.	6	5,2	21	18,1	62	53,4	27	23,3	0	0
P1-Q33) Playing computer games affect the social life of the people negatively.	13	11,2	34	29,3	51	44,0	17	14,7	1	0,9
P1-Q34) When computer games are played with a group (friends, family), it helps development of social skills.	2	1,7	35	30,2	64	55,2	15	12,9	0	0
P1-Q35) Playing violent games affect people negatively.	10	8,6	28	24,1	50	43,1	27	23,3	1	0,9

4.2.5. Game and Game Type Preferences

Referring to the Appendix D and Table 4.19, the mostly preferred game was the combination of Counter Strike and Half Life which are the same but only the difference is that, the Counter Strike includes both single and multiplayer content. These speedy games include human violence in the fantasy world. Next mostly preferred games were Need for Speed, which is a racing game and FIFA, which is a realistic sports game. Age of Empires, which is a real time strategy game, also have many ratings. Considering all of these games, as presented in the Appendix D, many of the top-ten games have violence components.

Table 4.19. The mostly rated games and game types

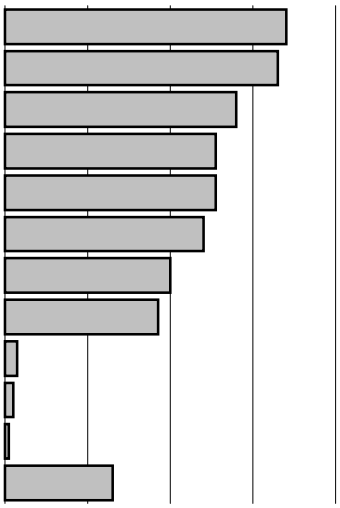
P1-Q36) MOSTLY RATED GAMES	**F**	**%**	**G%**
Counter Strike+Half Life	25	21,6	8,96
Need for Speed	20	17,2	7,17
FIFA	20	17,2	7,17
Age of Empires	19	16,4	6,81
Sims	8	6,9	2,87
Wolfenstain	8	6,9	2,87
Red Alert	7	6,03	2,51
WarCraft	7	6,03	2,51
Medal of Honor	7	6,03	2,51
Age of Mytology	5	4,3	1,79
Unreal Tournament	5	4,3	1,79
Others	148	-	53,0
Missing	39	33,6	-
Total Defined Game: 114	Total: 279 + 39 missing		Mode: Counter Strike + Half Life



Note. % is calculated using the subject size (116), represents the percentage of subjects who mentioned that game, G% is calculated using the total number of responses excluding the missing data (279), represents the percentage of the response among other 279 responses.

Table 4.20. Mostly rated game types

P1-Q37) MOSTLY RATED GAME TYPES	F	%	GT%
Action	68	58,6	15,4
Strategy	66	56,9	14,9
Sports	56	48,3	12,6
Simulation	51	44,0	11,5
Puzzle	51	44,0	11,5
Adventure	48	41,4	10,8
Fighting	40	34,5	9,03
Role-Playing	37	31,9	8,35
Board	3	2,59	0,68
Card	2	1,72	0,45
Word	1	0,86	0,23
Do not play	26	22,4	-
Missing	0	0	0



Total Game Type: 11 Total: 443+ 26 non-player Mode: Action Games

Note. % is calculated using the subject size (116), represents the percentage of subjects who selected that game type option, GT% is calculated using the total number of responses excluding the missing data and non-players (443), represents the percentage of the response among other 443 responses.

As for the game types, action games were exceeding the other types with 68 ratings. Then followed by Strategy games (66 r.), Sports games (56 r.), Simulation games (51 r.), Puzzle games (51 r.), Adventure games (48 r.), Fighting games (40 r.) and Role playing games (37 r.). Other defined game types by subjects were board, card and word games, which have very few ratings. 26 of the subjects chose the non-player option and did not define any of these types of games.

4.3. Subjects' Perceptions Toward the Use of Computer Games with Educational Features in Education

4.3.1. Use of Games in Curricula

In the case of subjects' perceptions toward the use of computer games with educational features in curricula, one of the major issues was the applicability of these games to different subject matters. It was apparent from the Table 4.21 that, 77% of the subjects informed that they can be applicable, despite 23% thought the opposite. While about 20% of subjects selected the 'strongly agree' option, no one selected the 'strongly disagree' option.

Table 4.21. Use of games in curricula- Subject matters, grade levels

Computer games with educational features;	F	%	Frequency bar graph
P2-Q1) can be applicable to all subject matters.			
Strongly Disagree	0	0	
Disagree	27	23,3	
Agree	66	56,9	
Strongly Agree	23	19,8	
Missing	0	0	

Mean: (2,97) ~ Agree Median: Agree Mode: Agree

	F	%	Frequency bar graph
P2-Q2) can be applicable to all grade levels.			
Strongly Disagree	0	0	
Disagree	24	20,7	
Agree	76	65,5	
Strongly Agree	15	12,9	
Missing	1	0,9	

Mean: (2,92) ~ Agree Median : Agree Mode: Agree

As for the applicability of them to all grade levels, the distribution was alike with the previous question, while the subjects who agreed with the expression increased to 78% and who disagreed with the expression decreased to 20%. The mean of the responses to both of these questions were 'agree'.

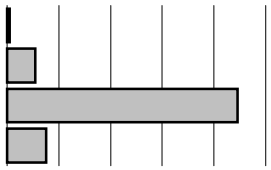
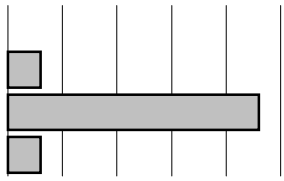
In terms of applicability of these games in accordance with the schools' curriculum plans, the following three expressions were agreed according to central tendency scores. In the first expression, subjects decided to confirm the applicability of these games in terms of goals of schools' curriculum plans with the percentage of 97%. The positive agreement ratings were continued to be high for the following two questions as well. It was revealed that, subjects thought during the utilization of these games in education, there will be no problem regarding time and classroom management (90% agreed with both of the statements) (See Table 4.22).

Table 4.22. Use of games in curricula- Goal, time, classroom management issues

	F	%	Frequency bar graph
P2-Q3) can be used in accordance with the goals of schools' curriculum plans.			
Strongly Disagree	1	0,9	
Disagree	3	2,6	
Agree	93	80,2	
Strongly Agree	19	16,4	
Missing	0	0	

Mean: (3,12) ~ Agree Median : Agree Mode: Agree

Table 4.22. (Continued)

	F	%	Frequency bar graph
P2-Q4) can be used without causing any problem with the schools' curriculum plans in terms of time.			
Strongly Disagree	1	0,9	
Disagree	11	9,5	
Agree	89	76,7	
Strongly Agree	15	12,9	
Missing	0	0	
Mean: (3,02) ~ Agree	Median: Agree	Mode: Agree	
P2-Q5) can be used without causing any problem with the schools' curriculum plans in terms of classroom management.			
Strongly Disagree	0	0	
Disagree	12	10,3	
Agree	92	79,3	
Strongly Agree	12	10,3	
Missing	0	0	
Mean: (3,00) Agree	Median : Agree	Mode: Agree	

4.3.2. Games and Educational Learning Goals in the Curricula

Concerning the positive effects of computer games with educational features in helping students to fulfill the educational learning goals (cognitive, affective, psycho-motor) defined in the schools' curriculum plans, all of the three expressions' mean rating scores were higher than 3,00; indicating that majority of the subjects rated these expressions in positive direction. As can be seen in the bar charts provided in the Table 4.23, the positive perceptional ratings became more apparent with the high percentages for the 'agree' option in combination with 'strongly agree' option (for cognitive goals: 96%, for affective goals: 87% and for psycho-motor goals: 89%). Regarding the percentages, subjects were agreed

mostly upon the help of computer games with educational features in fulfillment of cognitive goals, then psychomotor goals and then affective goals. (See Table 4.23)

Table 4.23. Capabilities of games, in helping students to fulfill the educational learning goals which are defined in the schools' curricula

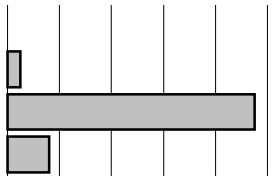
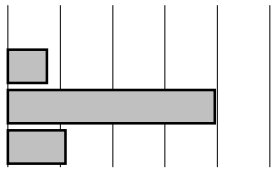
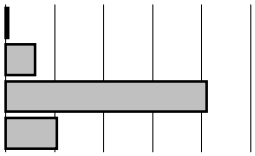
Computer games with educational features;	F	%	Frequency bar graph
P2-Q6) can help students fulfill cognitive learning goals which are defined in the schools' curriculum plans.			
Strongly Disagree	0	0	
Disagree	5	4,3	
Agree	95	81,9	
Strongly Agree	16	13,8	
Missing	0	0	
Mean: (3,09) ~ Agree	Median: Agree	Mode: Agree	
P2-Q7) can help students fulfill affective learning goals which are defined in the schools' curriculum plans.			
Strongly Disagree	0	0	
Disagree	15	12,9	
Agree	79	68,1	
Strongly Agree	22	19,0	
Missing	0	0	
Mean: (3,06) ~Agree	Median : Agree	Mode: Agree	

Table 4.23. (Continued)

Computer games with educational features;	F	%	Frequency bar graph
P2-Q8) can help students fulfill psychomotor learning goals that are defined in the schools' curriculum plans.			
Strongly Disagree	1	0,9	
Disagree	12	10,3	
Agree	82	70,7	
Strongly Agree	21	18,1	
Missing	0	0	

Mean: (3,06) ~ Agree Median : Agree Mode: Agree

4.3.3. The Way that Computer Games with Educational Features Should be Used in Education to be More Effective in Students' Learning

The aim of using computer games with educational features were specified in the questionnaire as a teaching aid, main instructional tool, reward, something to fill the free times in courses. Considering the ratings, subjects mostly tended to agree on the expression that, these games can be more effective when used as a teaching aid (Mean: 3,26 and with 98%). The second choice of subjects was using these games as a reward (Mean: 2,94 and with 78%). A slightly positive rating was along with the expression of using them to fill the free times of students (Mean: 2,52, mode: Agree with 54%). Contrary to these agreement ratings, remaining aim was not perceived to be feasible. For the question 10 of part II, 60,4% disagreed while 40% agreed on the feasibility of using games as a main instructional tool (Mean: 2,43; mode: disagree). (See Table 4.24)

Table 4.24. The way games should be used in education to be more effective in students' learning – Aim of using

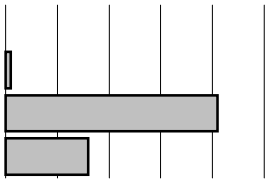
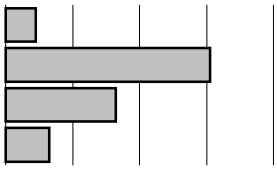
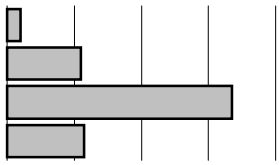
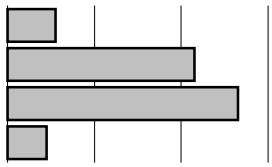
Computer games with educational features;	F	%	Frequency bar graph
P2-Q9) can be effective in learning when used as a teaching aid in courses.			
Strongly Disagree	0	0	
Disagree	2	1,7	
Agree	82	70,7	
Strongly Agree	32	27,6	
Missing	0	0	
Mean: (3,26) ~ Agree Median: Agree Mode: Agree			
P2-Q10) can be effective in learning when used as a main instructional tool in schools.			
Strongly Disagree	9	7,8	
Disagree	61	52,6	
Agree	33	28,4	
Strongly Agree	13	11,2	
Missing	0	0	
Mean: (2,43) ~Between disagree and agree Median : Disagree Mode: Disagree			
P2-Q11) can be effective in learning when used as a reward in courses.			
Strongly Disagree	4	3,4	
Disagree	22	19,0	
Agree	67	57,8	
Strongly Agree	23	19,8	
Missing	0	0	
Mean: (2,94) ~ Agree Median : Agree Mode: Agree			

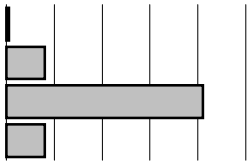
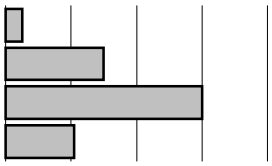
Table 4.24. (Continued)

Computer games with educational features; **P2-Q12)** can be effective in learning when used to fill the free times of students in courses.	F	%	Frequency bar graph
Strongly Disagree	11	9,5	
Disagree	43	37,1	
Agree	53	45,7	
Strongly Agree	9	7,8	
Missing	0	0	

Mean: (2,52) ~ Between disagree and agree Median: Agree Mode: Agree

When subjects were asked how learning can be more effective when games provide cooperative and competitive learning environments, subjects favored the use of games with cooperative learning environment (Mean: 2,98, with the percentage of agreement: 85%) rather than the use of games with competitive learning environments (Mean: 2,84 with the percentage of agreement: 70%). However both of them gained high popularity of agreement regarding the percentage scores. As for the rates of disagreement, more subjects disagreed on the usage of games that provide competitive learning environments (30%) while for the cooperatively based games the disagreement proportion was lower (15%) (See Table 4.25).

Table 4.25. The way games should be used in education to be more effective in students' learning – Cooperative & competitive

Computer games with educational features;	F	%	Frequency bar graph
P2-Q13) can be effective in learning when they provide cooperative learning environment.			
Strongly Disagree	1	0,9	
Disagree	16	13,8	
Agree	82	70,7	
Strongly Agree	16	13,8	
Missing	1	0,9	
Mean: (2,98) ~ Agree	Median : Agree	Mode: Agree	
P2-Q14) can be effective in learning when they provide competitive learning environment.			
Strongly Disagree	5	4,3	
Disagree	30	25,9	
Agree	60	51,7	
Strongly Agree	21	18,1	
Missing	0	0	
Mean: (2,84) ~ Agree	Median : Agree	Mode: Agree	

Goal specification questions asked how the computer games with educational features can be more effective in learning when a goal is specified or not, or when students are allowed to choose their own goals in a game. Although both of the statements were agreed upon by subjects, for the expressions of effectiveness of using games that provides goals and games that allow students to chose their own goals (questions 15 and 17), the mean score was higher for the former expression with the mean of 3,08 and the agreement percentage of 89%. Whereas the mean score was 2,94 and the agreement percentage of 83% for the latter case. As for the question 16, subjects negatively rated the expression of the

possible effectiveness of these games when a goal is not specified (Mean: 2,16). The disagreement percentage was 72%, 14% of which strongly disagreed with this statement. (See Table 4.26)

Table 4.26. The way games should be used in education to be more effective in students' learning – Goal specification

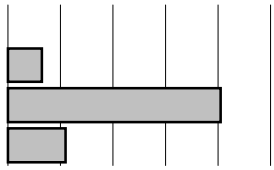
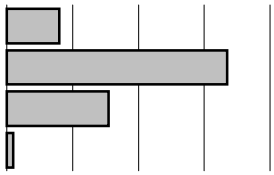
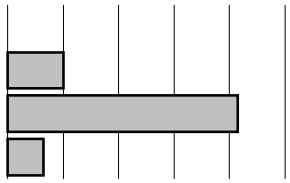
Computer games with educational features;	F	%	Frequency bar graph
P2-Q15) can be effective in learning when a goal is specified in a game.			
Strongly Disagree	0	0	
Disagree	13	11,2	
Agree	81	69,8	
Strongly Agree	22	19,0	
Missing	0	0	
Mean: (3,08) ~ Agree Median: Agree Mode: Agree			
P2-Q16) can be effective in learning when a goal is <u>not</u> specified in a game.			
Strongly Disagree	16	13,8	
Disagree	67	57,8	
Agree	31	26,7	
Strongly Agree	2	1,7	
Missing	0	0	
Mean: (2,16) ~ Disagree Median : Disagree Mode: Disagree			

Table 4.26. (Continued)

Computer games with educational features; **P2-Q17)** can be effective in learning when students are allowed to choose their own goals in a game.	F	%	Frequency bar graph
Strongly Disagree	0	0	
Disagree	20	17,2	
Agree	83	71,6	
Strongly Agree	13	11,2	
Missing	0	0	



Mean: (2,94) ~ Agree Median : Agree Mode: Agree

As subjects asked to rate the realistic goals and fantasy goals in terms of effectiveness of using them in students' learning, the distribution is more homogenous in the former one with 95% agreed (Mean: 3,14). Whereas, the mean scores and percentage of agreement ratings were much lower in the case of effectiveness of games with fantasy goals (Mean: 2,68, percentage of agreement: 58%, percentage of disagreement: 42%) having a more heterogeneous distribution as represented in the bar graph of the question 19 (See Table 4.27).

Table 4.27. The way games with educational features, should be used in education to be more effective in students' learning – Realistic & Fantasy goals

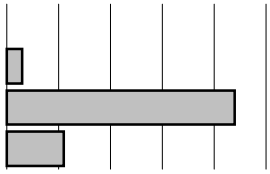
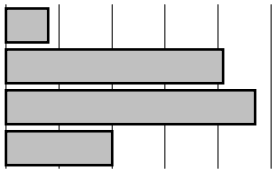
Computer games with educational features;	F	%	Frequency bar graph
P2-Q18) can be effective in learning when they are based on realistic goals.			
Strongly Disagree	0	0	
Disagree	6	5,2	
Agree	88	75,9	
Strongly Agree	22	19,0	
Missing	0	0	
Mean: (3,14) ~ Agree	Median : Agree	Mode: Agree	
P2-Q19) can be effective in learning when they are based on fantasy goals.			
Strongly Disagree	8	6,9	
Disagree	41	35,3	
Agree	47	40,5	
Strongly Agree	20	17,2	
Missing	0	0	
Mean: (2,68) ~ Agree	Median : Agree	Mode: Agree	

Table 4.28. Cross Tabular representation of the Part II questions

Computer games with educational features;	Strongly Disagree		Disagree		Agree		Strongly Agree		Missing	
	F	%	F	%	%	%	F	%	F	%
P2-Q1) can be applicable to all subject matters.	0	0	27	23,3	66	56,9	23	19,8	0	0
P2-Q2) can be applicable to all grade levels.	0	0	24	20,7	76	65,5	15	12,9	1	0,9
P2-Q3) can be used in accordance with the goals of schools' curriculum plans.	1	0,9	3	2,6	93	80,2	19	16,4	0	0
P2-Q4) can be used without causing any problem with the schools' curriculum plans in terms of time.	1	0,9	11	9,5	89	76,7	15	12,9	0	0
P2-Q5) can be used without causing any problem with the schools' curriculum plans in terms of classroom management.	0	0	12	10,3	92	79,3	12	10,3	0	0
P2-Q6) can help students fulfill cognitive learning goals which are defined in the schools' curriculum plans.	0	0	5	4,3	95	81,9	16	13,8	0	0
P2-Q7) can help students fulfill affective learning goals which are defined in the schools' curriculum plans.	0	0	15	12,9	79	68,1	22	19,0	0	0
P2-Q8) can help students fulfill psychomotor learning goals which are defined in the schools' curriculum plans.	1	0,9	12	10,3	82	70,7	21	18,1	0	0
P2-Q9) can be effective in learning when used as a teaching aid in courses.,	0	0	2	1,7	82	70,7	32	27,6	0	0

Table 4.28. Cross Tabular representation of the Part II questions (Continued)

Computer games with educational features;	Strongly Disagree		Disagree		Agree		Strongly Agree		Missing	
	F	%	F	%	%	%	F	%	F	%
P2-Q10) can be effective in learning when used as a main instructional tool in schools.	9	7,8	61	52,6	33	28,4	13	11,2	0	0
P2-Q11) can be effective in learning when used as a reward in courses.	4	3,4	22	19,0	67	57,8	23	19,8	0	0
P2-Q12) can be effective in learning when used to fill the free times of students in courses.	11	9,5	43	37,1	53	45,7	9	7,8	0	0
P2-Q13) can be effective in learning when they provide cooperative learning environment.	1	0,9	16	13,8	82	70,7	16	13,8	1	0,9
P2-Q14) can be effective in learning when they provide competitive learning environment.	5	4,3	30	25,9	60	51,7	21	18,1	0	0
P2-Q15) can be effective in learning when a goal is specified in a game.	0	0	13	11,2	81	69,8	22	19,0	0	0
P2-Q16) can be effective in learning when a goal is not specified in a game.	16	13,8	67	57,8	31	26,7	2	1,7	0	0
P2-Q17) can be effective in learning when students are allowed to choose their own goals in a game.	0	0	20	17,2	83	71,6	13	11,2	0	0
P2-Q18) can be effective in learning when they are based on realistic goals.	0	0	6	5,2	88	75,9	22	19,0	0	0
P2-Q19) can be effective in learning when they are based on fantasy goals.	8	6,9	41	35,3	47	40,5	20	17,2	0	0

4.3.4. Perceptions of Subjects in terms of Students' and Teachers' Thinking of the Use of Computer Games with Educational Features in Education

Considering the reflections that subjects completed on the last question of the questionnaire, perceived thought of both students and teachers were examined regarding the use of computer games with educational features in courses. In order to understand the general view of the thoughts, the statements were labeled as positive (Positive), negative (Negative), both positive and negative (Both), not in any direction or neutral (No Direction) and missing (Missing). In the Table 4.29. they were individually documented and in the Table 4.30 the combination of statements about students' and teachers' thoughts were presented.

Table 4.29. Individual documentation of the nature of responses for the Question 21, in part II: Thoughts of teachers' and students'

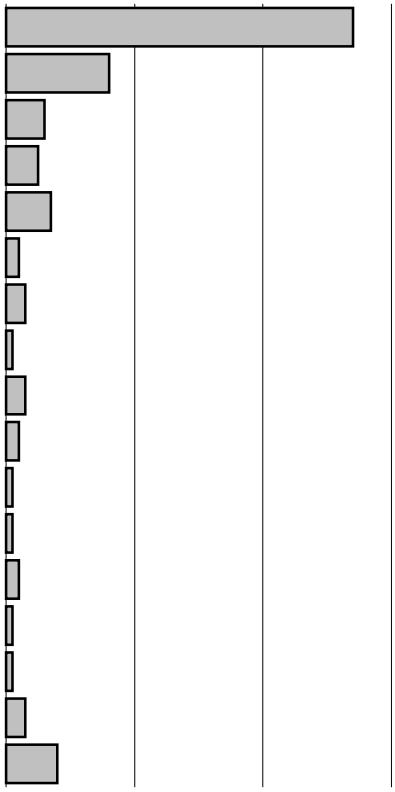
Students' T.	F	%	Frequency Bar Graph
Positive	81	69,83	
Negative	6	5,17	
Both	16	13,79	
No Direction	2	1,72	
Missing	11	9,48	
	116	100	

Teachers' T.	F	%	Frequency Bar Graph
Positive	63	54,31	
Negative	9	7,76	
Both	23	19,83	
No Direction	12	10,34	
Missing	9	7,76	
	116	100	

As can be depicted in the Table 4.29. majority of the subjects responded the question as students (70%) and teachers (54%) have positive thoughts about using games with educational features in education or courses in contrast to the small group which perceived the thoughts of them negatively (5% for students, 8% for teachers). Other perceived opinion information was that, while 14% of the respondents conveyed both positive and negative thought statements, this proportion is 20% for teachers. According to these results, it was apparent that, more students have positive thoughts about using games in courses than their teachers according to perceptions of subjects. Moreover, more teachers (10%) than students (2%) were attributed neither positive nor negative statements.

As in the case of Table 4.30, while some subjects (50%) responded with attributing similar thoughts both to the teacher and the students, others (40%) responded the question as, there are some differences in their thoughts according to positive or negative perspective. Besides, there are some missing areas in one of the groups or both of them (10%). The majority of the subjects (46,6%) stated that, both students and teachers have positive thoughts about using games with educational features in education/courses. Whereas, only one respondent provided negative responses for both groups. As can be seen in the graph in Table 4.30, the responses were accumulated on the perceived students' thoughts that are positive (14% for positive thoughts for students, both positive and negative for teachers; 5 % for positive and no direction relatively, 4% for positive and negative relatively). Also 6% of the respondents described the thoughts of students as both negative and positive, and teachers' as positive.

Table 4. 30. The combination documentation of nature of responses for the Question 21: Part II: Thoughts of teachers' and students'

Students' T.	Teachers' T.	F	%	Frequency Bar Graph
Positive	Positive	54	46,55	
Positive	Both	16	13,79	
Positive	No Direction	6	5,17	
Positive	Negative	5	4,3	
Both	Positive	7	6,03	
Both	Both	2	1,72	
Both	Negative	3	2,59	
Both	Missing	1	0,86	
Both	No Direction	3	2,59	
Negative	Positive	2	1,72	
Negative	Negative	1	0,86	
Negative	Both	1	0,86	
Negative	No Direction	2	1,72	
No Direction	No Direction	1	0,86	
No Direction	Both	1	0,86	
Missing	Both	3	2,59	
Missing	Missing	8	6,90	
		116	100	

Perceived Students' Thoughts

As presented in the Table 4.31, the most of the subjects mentioned about the enjoyment that students feel when playing game in the course (45 participants) by stating like "The course is very enjoyable in this way"[1], (See Appendix E). Generally in combination with this perception, they also added that students want to be involved within this method in every course (23 p.) by stating such as "I enjoy playing games in the course and I wish every course would like that" [2]. Another depicted opinion of students was that, they prefer games to traditional education (13 p.) by responded such as "I was bored with

the mere verbal instruction. Fortunately, they understand us and bring some educational games so that we are playing enjoyably" [3]. In contrast, two participants thought that students prefer traditional education to playing games.

Table 4.31. Perceptions of subjects in terms of students' thinking

	F	%
Attitudes toward the courses which utilize games		
Feel enjoyment when playing game in the course	45	38,8
Want every course and this course always like that	23	19,8
Prefer game to traditional learning	13	11,2
Prefer traditional course	2	1,72
Teacher		
Positive feelings about teacher	5	4,31
Negative feelings about teacher	1	0,86
Pleasure		
Like the game	13	11,2
Enthusiasm, captivation, and challenge with the game	11	9,48
Want to continue with the game	9	7,76
Prefer different game	8	6,90
Prefer Internet to playing games	2	1,72
Bored with the game	13	11,2
Awareness of the aim		
Aware that game is course related	7	6,03
Not aware of the aim or goals	3	2,59
Thinking & Learning		
Learn	7	6,03
More permanent learning effect	4	3,45
Thinking critically	6	5,17
Thinking of the game logic	4	3,45
Reinforce their previous knowledge through game	2	1,72
Do not understand/learn anything from the game	2	1,72

Table 4.31. (Continued)

	F	%
Social		
Require help from teacher	2	1,72
Social interaction and getting help from others	2	1,72
Competition	6	5,17
Increased interest to computers	2	1,72
Increased attention	1	0,86
Increased curiosity	1	0,86
Increased creativity	2	1,72
Doubt about examination	1	0,86
Do not know	2	1,72
Missing	9	7,76

They for example stated that: “I wish I study from the book” [4]. As for perceived attitudes toward teacher who integrate games into his/her class, it was mostly positive (5 p.) than negative (1 p.). For example two of them stated, “I wish every course would like this course. I love my computer teacher” [5] and “This teacher does not teach us anything. She always makes us play games” [6].

While totally 33 participants were in the opinion that students like the game selected by the teacher (13 p.), captivated into the game (11 p.) and want to continue with the game (9 p.), 23 participants thought that students either bored (13 p.) or prefer different games and the Internet (10 p.). Five participants stated, “I like this game very much” [7], “Little left to fulfill the aim!” [8] “I wish the teacher will not start teaching, so we can continue with the game” [9].“Such a boring game! To make it educational, they create something boring” [10], “Instead of this, can’t we run and play –another- game?” [11]

Considering the awareness that the game is course related, 7 participants thought that students are aware of the goals while 3 participants thought otherwise. These two contrast opinions can be exemplified by the statements as, “The scene and the actions that I apply in

the game are related with the content that teacher taught."[12] "What is our aim?"[13] Moreover with respect to learning issues, totally 11 participants directly stated that students learn something such as stating "As we play games, we learn" [14], 2 participants thought they reinforced previously learned subject through games such as mentioned "Now, I begin to understand better what teacher taught us yesterday." [15], 6 participants stated that students think critically about content when they play such as responding "if x=y, y=x. Since the game asked this, the answer must be 3." [16], 4 participants mentioned the students' thought process about the game logic as stating, "How I will do this?" [17]. As opposed to all of those, 2 participants thought that they do not understand or learn anything as stating, "I do what teacher told us, but I do not understand anything" [18]

In terms of social interaction, competition was specified mostly (6 p.). One of the subjects responded, "I will be the number one!" [19]. Besides, 2 participants related the help of teacher and 2 participants related the help of other students, by stating such as, "Teacher! How I will pass this level?"[20], "Look what I found. If you do this action, this will happen" [21]. Apart from all of these, there were other perceived opinions that, students think their creativeness, attention and curiosity is increased besides interest toward computers. One participant also noted that students were doubtful about the examination although they enjoy playing games during the course.

Perceived Teachers' Thoughts

More diverse opinions were given from the participants considering teachers' thoughts (See Table 4.32). First of all 5 participants thought that teachers have positive thoughts about the using these games in their courses while 5 participants think conversely. Two of the respondents stated, "From now on, they are more interested in the course. I must continue in this way" [22], "I wish I had taught the content using direct instruction." [23]. There were serious doubts raised about the process of using games. While 7 participants were in the opinion that teachers have doubts about the overall effectiveness of this process,

other doubts are about time (2 p.), accordance of game with the goals (4 p.), suitability of the game to students' levels (3 p.) and comprehensiveness of the game (3 p.). Illustrative statements were: "I wonder if it works" [24], "I wonder if I will catch up with the time" [25], "I wonder the game I selected is appropriate for my instructional goals" [26], "I wonder the game I selected is appropriate for students levels" [27]. I must prepare more comprehensive games to support students" [28].

Unlikely in the case of students' thoughts, one participant stated that teachers think students are aware of the goals. Others thought that teachers have doubts about it (2 p.) and they try to increase their awareness (4 p.). To illustrate, subjects answered that, "I fear that students' interest is focused on the games only" [29], "I have to convey my aim of making them playing games well" [30].

One of the mostly mentioned issues was the classroom management. More participants attributed teachers' thoughts to positive opinions (28 p.), rather than negative ones (15 p.). While 7 participants stated that teachers thought the management and observation of the students become harder than traditional method such as stating "Classroom observation is become somewhat harder. Sustain the discipline become harder" [31]. Nine participants counteracted by stating like, "Classroom management is become easier" [32]. Only one participant tried to draw attention to increased noise levels, however 7 participants thought the opposite. For example they stated, "You are making too much noise, be quiet!" [33], "They are not making noise and they learn as well" [34]. Moreover, due to the management problems, some participants (3 p.) remarked that teachers feel tired by responded like "Again, I become tired very much" [35]. Whereas 8 participants thought that this teaching method is easier for teachers than the traditional one. One of them mentioned, "Lecturing by this way make the instructional process easy for me" [36]. Even 3 participants stated that teachers prefer this type of teaching to traditional teaching by illustrating that "I am free from lecturing" [37]. Moreover, same number of participants (3 p.) mentioned about the time issues negatively and positively in terms of classroom management. While as an

example one stated that, “Time management becomes harder” [38], another one stated, “Using games in education is efficient in terms of time” [39]. In addition to these, one participant stated that it is harder for a teacher to redirect students again to traditional methods after they play games.

In terms of student’s pleasure, it was stated that teachers thought more students are enjoying (8 p.) rather than they are bored (2 p.) and their motivation (15 p.) and attention (8 p.) is increased with this method. Even they are captivated themselves in the games (2 p.). Example statements were: “Children like this” [40], “It is apparent that they are bored” [41], “Since the students are easily motivated, I am relaxed” [42], “They pay more attention to the course” [43], “They are captivated themselves very much” [44].

Regarding the learning issues totally 34 participants thought that teachers have positive thoughts about the gain from this method of using games. According to given statements, teachers thought through games students better understand the content (9 p.), benefit from the game rather than just playing (9 p.), learn useful things (11 p.), reinforce previously learned subject (2 p.), and develop many other useful things. To illustrate five participants stated that, “Students will understand this content better” [45], “When I make students play games, they both enjoy and learn something as well” [46], “They both reinforce their mathematic skills and learn the services that a municipality must give. They learn income and expense calculation and learn acting with plans [47], “Reinforce their previously learned knowledge by this way”[48], “Their hand-ability, fast thinking ability and strategy knowledge are developed” [49]. However, while 2 participants were in the negative opinion that teachers think students can not have any gain from those games, 7 participants responded that teachers think about investing effort to help students benefit from the game. To illustrate, one of them stated, “I have to relate what they learn from the game with the content to serve our aim, at the end of the lesson”[50] and “This method is nonsense. Nobody is interested in the course.” [51]

Table 4.32. Perceptions of subjects in terms of teachers' thinking

Statements		F	%
About using games in courses			
Think to continue with this method		3	2,59
Think of applying the same method to other courses		2	1,72
Negative feelings about using games in to courses		5	4,31
Doubts			
Doubt about the whole process effectiveness		7	6,03
Doubt about the time		2	1,72
Doubt about the accordance of game with the goals		4	3,45
Doubt about the suitability of game with students levels.		3	2,59
Doubt about the comprehensiveness of the game		3	2,59
Awareness of students about the aim			
Fear that students do not aware of the goals		2	1,72
Aim oriented		1	0,86
Put effort to increase their awareness		4	3,45
Classroom Management			
Problems:	Hard to observe and manage	7	6,03
	Increased noise	1	0,86
	Teachers become tired	3	2,59
	Hard to redirect students to traditional methods	1	0,86
	Time	3	2,59
Positive	Easiness of observation and management	9	7,76
	Silence	7	6,03
	Easiness of instructional process for teachers	8	6,90
	Increased given feedback	1	0,86
	Time	3	2,59
	Escape from traditional method and talking	3	2,59

Table 4.32. (Continued)

Statements	F	%
Students' Pleasure		
Students enjoy playing game	8	6,90
Students are bored	2	1,72
Motivation		
Increased students motivation	15	12,93
Increased attention to the course	8	6,90
Captivation	2	1,72
Increased interest to computers	1	0,86
Students' benefit from the game		
Increased understandability of the content	9	7,76
Students make use of the game beneficially	9	7,76
While students enjoying they learn useful things	11	9,48
Students reinforce previously learned subject	2	1,72
Increased thinking strategies	1	0,86
Eye-hand coordination	1	0,86
Increased creativeness	1	0,86
More effort is invested to help students benefit more from the game	7	6,03
Doubt about whether students benefit from it or not	1	0,86
Negative perceptions about students skills of playing games	2	1,72
Application		
Students apply their knowledge through games	3	2,59
They learn by doing	1	0,86
Active involvement / Engagement	5	4,31
The role of the teacher		
The role of the teacher decreased	1	0,86
Guidance	8	6,90
They also want to play games before and at that time	2	1,72
Cooperative learning	1	0,86
Missing	9	7,76

As for the application of knowledge, 6 participants stated that teachers think students were actively involved in the process and apply their knowledge through games by declared like “All of the students participate to the course actively”[52], “Students learn something by doing and trying themselves ”[53]. In this process the role of the teacher was decreased (1 p.) to a guide (8 p.). Two respondents exemplified their arguments as, “By this way my duties are lessened” [54], “Teacher act as a guide. Propose solutions and tactics” [55]. Two participants also stated their positive perceptions about teachers that, they also want to play games by stating, “Almost, I, myself, will play it now” [56].

4.4. Future Plans of Subjects Regarding the Use of Computer Games with Educational Features in Their Courses or in Learning Environments that They will Design

As documented in the Table 4.33. a big proportion of the students (83%) were in the opinion that they will use computer games with educational features in their future profession. Whereas 11% think they will not. There were diverse answers for the question of ‘how’ to use (See Table 4.34). Mostly rated way is using them as an aid to reinforce or practice previously learned subject (24 participant). They for example describe that, “To reinforce what I taught, I can use a game” [57].

Table 4.33. Positive and negative answering proportions to Part II-Question 20

	F	%
Positive (Yes)	96	82,76
Negative (No)	13	11,2

Secondly mostly favored statement was (21 p) “I can use it as a reward” [58], while only 4 participants stated that it can be used as a main instructional tool. One of the subjects stated, “Regarding the instructional goals, I plan to use it as the main instructional material” [59]. Also the time was another issue that subjects related the use of games. 7 participants

thought that they can use games at the end of the lesson, while 2 participants plan specially reserving time in the lesson. They stated that, “It will have positive effects on students to make them play games during the last 10 minutes of lessons” [60], “I will allocate a time portion and practice with students” [61]. Five participants also mentioned that, it would be better to use computer games not excessively by stating such as, “I can use it but not frequently” [62].

Similarly, many participants also noted the requirement of accordance with the content of the lesson (11 p.) and the goals (8 p.) to use these games. For example, they stated, “Though finding games that is related with the content, I made students to play them” [63], “Considering the goals of the course, and to the extent that the game reflect the content of the course, I can use the educational games” [64]. While considering the curriculum issues, it is required to note that 8 participants plan to use the games if they were the teacher at the elementary or secondary school. They generally stated that, “They can be used in elementary grades” [65]. In the same context, 6 participants planned to use these games to support other courses, such as asserting, “I can use them as a support material for instruction of different courses” [66].

As for the learning goals, 12 participants stressed that using games will provide better learning for students by stating like, “For a more effective instruction, I plan to use computer games in my profession” [67]. To specify, 6 participants plan to use it to develop the thinking strategies of students, 2 to fulfill affective learning goals, and 4 to fulfill goals in general. Three participants described as, “I plan to use them in order to increase the mental activities of students (Problem based games)” [68], “It will be beneficial for students’ cognitive and affective developments”[69], “I believe that I can fulfill the goals of some course by using educational computer games”[70].

Thirdly rated method of using games is to motivate students, increase their attention and interest to the course (17 p.). Participants generally stated, “I plan to use them in the way to motivate students and increase interest of the students” [71]. Moreover, it was reported

that they are used to provide students enjoyment (5 p.), to increase their understanding of abstract concepts more by visualization and concretization (7 p.), allow them to develop fantasy worlds (3 p.), etc. Three of them noted, “They help the instruction to be more enjoyable” [72], “To increase visualization, I can use them” [73], “They can be used to develop students’ fantasy worlds” [74].

Considering the computers, one participant plan to use it to increase interest to the computers, and 10 participants generally stated that “to develop the mouse and keyboard using skills” [75] or “to increase the familiarity with the computers” [76]. Considering the games that participants want to use, 9 of them plan to use simulation games, while 4 participants plan to use small games, which may be prepared by themselves.

For social aspect, both cooperation (5 p.) and competition (4 p.) considerations were mentioned a little. They generally stated “I plan to use computer games with educational features while providing a cooperative and competitive environment with my students” [77].

As for 13 subjects who did not prefer to use computer games, the reasons were diverse as presented in the continuing Table 4.34.

Table 4.34. Future plans of subjects regarding the use of computer games

Statements	F	%
Use as a teaching aid (to reinforce, to practice)	24	20,69
Use as a reward	21	18,10
Use as a main instructional tool	4	4,45
Use to fill the empty time in the course	3	2,59
Use at the end of the lesson	7	6,03
Use by allocating some time in the lesson	2	1,72
Use seldom	5	4,31
To support other courses	6	5,17
Use in small grades	8	6,90
Use in accordance with the goals of the lesson	8	6,90
Use in accordance with the content of the lesson	11	9,48
Use for more effective learning	12	10,35
To develop thinking skills	6	5,17
To fulfill affective learning goals	2	1,72
To fulfill goals in general	4	4,45
To motivate, increase attention and interest	17	14,66
To provide enjoyment	5	4,31
To increase visualization, concretization	7	6,03
To develop fantasy world	3	2,59
To develop creativeness	1	0,86
To provide feel of accomplishment	2	1,72
To increase interest to computers	1	0,86
To develop computer related skills and knowledge	10	8,62
Use small games	4	3,49
Use simulation games	9	7,76
Increase cooperation	5	4,31
Competition	4	3,49

Table 4.34. Future plans of subjects regarding the use of computer games (Contin.)

Statements	F	%
Will not use computer games because;		
No (only)	4	3,45
Computer games restrict the creativity [78]	1	0,86
The aim of the games are not related with education [79]	1	0,86
There is no good quality educational game [80]	1	0,86
I will not be a teacher [81]	1	0,86
Computer games have more disadvantages than advantages [82]	1	0,86
It will decrease the importance and the effect of the computer games from the perspectives of students [83]	1	0,86
Hard to lead the course according to the goals [84]	1	0,86
The games should only be used for enjoyment [85]	1	0,86
Requires skills to integrate [86]	1	0,86
More productive activities can be conducted instead of computer games [87]	1	0,86
Missing	7	6,03

4.5. Interview Analysis

From the overview of the interview analysis, it is found that, statements of the participants were not stable according to the definition of the game. Referring to the Figure 1.1. in the Chapter 1, most of the participants give positive responses considering the "Instructional games" part of the figure. Whereas they give more negative responses considering the part that do not include any "instruction" component. Each of the participants perceived the questions according to these two different points of views.

Referring to the Figure 1.1. while most of the participants' own definition of "computer games with educational features" only cover the "educational games", they answered only considering these types of games. Few participants answered the questions regarding the whole circle of games as defined in the figure.

Some other participants who expressed negative perspectives toward the computer games that do not include any instructional component in the figure also expressed positive perspectives toward the educational games. During the interview, these participants were requested to answer the questions considering their definition of educational games besides games in general, since the answers to these two perspectives of participants were very opposite.

For the first part of the analysis, statements that are explicitly related with the games that do not have any educational features will be explained. For the following several parts of the analysis, the answers are all related with the "computer games with educational features" for participants who perceived the questions as intended, and related with the "educational games" for participants whose answers differ according to their differentiation of market games and educational games in terms of their own terminology.

4.5.1. Participants General Perceptions Toward Computer Games and Playing

As can be seen in the Table 4.35, many of the statements were negative. Considering the perceived educational features of computer games in the market, as only one participant stated that the games that are not specifically designed educational purposes also have educational features, while 5 participants stated otherwise. They for example stated, "I think that not only the games that are specifically prepared considering mathematics, but also the FRP games or strategy games can be useful and educational."[I1], and other statements were like "There is no educational features that is specifically intended in the computer games as we exclude the games that are used in the educational software" [I2]. Moreover one participant also protested, "Unfortunately there is not any computer games that is education oriented, in the market"[I3].

Table 4.35. Participants' general perceptions toward computer games and playing

Statements	F
Some market games have educational features	1
Some market games have no any educational features	5
There is not any educational game in the market	1
Some market games negatively effect psychology of students	2
Some market games negatively affect social life	1
Some market games positively affect social life	1
Some market games lead to addiction	6
Some market games have violent content which negatively effect students	4

Besides, participants also stated that some market games have negative effects on psychology (2 participants) and social life (1p.) of the students. One of them stated, "There are games that have not educational purpose and there are games that negatively affect psychology or social relations of the students. However, I do not think that games that are used for educational purposes lead to negative results in general" [I4]. On the other hand, only one participant expressed "Especially I like role playing games very much. You communicate with the characters in the game individually and according to the decisions you made something happen. So I think this is effective in terms of socialization" [I5].

Other mostly mentioned issues were addiction and violence. Six participants stated that some market games lead to addiction and four participants stressed the violent content of the market games. Example statements are: "Computer games may lead to some kind of addiction"[I6], "Although the games that I come across are generally include violence, there are many kinds of games. I believe that violent games make people progress toward more violence"[I7].

4.5.2. Perceptions Toward the Use of Computer Games with Educational Features, in the Curricula, Schools and Courses: Applicability, Advantages and Disadvantages

Considering the applicability of using these games (See Table 4.36), it was mostly stated that these games can be used in every course (3 p.) and also to support other courses (2p.). Two of the participants stated, "It can be applicable to almost all of the courses I think" [I8] and "If students have some deficiency in other courses, when we transform that into a format which is more attractive, more understandable and in a way that students want to perform, through playing games, we will remove these deficiencies in the other courses" [I9].

Table 4.36. Applicability of using these games in several courses

Statements	**F**
Computer games with educational features;	
can be used in every course	3
can be used to support other courses	2
can be used in computer courses	2

Table 4.37. Mentioned subject names

Subject names	**F**
Mathematics	4
Natural Science	3
Computer Programming	1
Philosophy	1

However, as can be seen in the Table 4. 37, the mostly mentioned subjects were mathematics and natural science. Considering the computer courses, only one student gave

example as computer programming. Moreover, although many participants mentioned about the psychomotor goals attained related with the computer courses, in terms of computer courses only 2 participants stated that, this method can be applicable by stating, “I do not think for computer courses. Certainly this [method] can be applicable for the computer courses as well” [I10].

In terms of applicability, advantages and disadvantages of using these games in education, the statements were generally about time, classroom management, school administration and the curriculum (See Table 4.38). Regarding the time issue 3 participants thought that time can be saved when these games are used in courses. For example one of them stated, “If right games are selected, due to the interest and concentration to the course and when these games given as a reward, the wasted time become less. Since the concentration is more focused, something that is learned in one hour may be learned in a shorter time. In courses, the time is not wasted but saved” [I11]. However 8 participants think otherwise. Not only the time, but also classroom management (4p.) in general, students’ movements (1 p.) and noise (2p.) were mentioned as potential problems encountered. One of the participants combined all of these problems and expressed: “Computer games take very much time. Maybe you have to allocate the whole hour. Maybe you may stay behind the curriculum plan. Classroom management may be harder. Because children make too much noise by saying ‘I do it in this way’ or ‘I did’. You have to manage the students well” [I12]. Contrary to this opinion, few but some of the participants stated that classroom management in general (2p.) and the control of students movements (1p.) are easier as well as the noise level is lower (1p.). Two of these participants described, “It provides easiness to keep the discipline in terms of classroom management. Since all of the attention is on the monitor, it is very useful for classroom management. At least less remain to do for teachers” [I13] and “If the game really motivates the student, since most of the children adapted to the game, there will be no noise and they will not move. They do not want to exit or recess” [I14].

Some other considerations were related with the drawbacks such as students do not know the aim of playing these games (7p.). For example, one of these participants stated, "It maybe enjoyable for students but they are not aware of what they learned. When playing games, students may think that 'it is a good game and enjoyable but what about the examination questions, I wonder what I have learned'" [I15]. Besides, they may always want to play games (7p.), or they do not want to return to the traditional methods (2p.). To illustrate this, two of the participants described, "If the game arouses the interest of the students very much, students may ask the teacher like 'I want to play more'. And this may prevent the smoothness of classroom activities" [I16] and the other respondent stated, "They may forget the course and concentrated on the game. They do not want to return to the lecture. They are completely motivated to the game. Such things may happen, but these considerations are all depend on the teacher" [I17]. Referring to the last statement, four some participants also agreed that teacher has the power of changing the situation if he/she wants regardless of problems. However, two participants were pessimistic. One of them told, "However much idealist we are, the applying this [method] is very hard. For example, all of the graduates said 'I will do this, do that', but according to what I hear, definitely the situation is not like that, in the schools" [I18].

Another issue is the permission of the school administration for using these games in courses. Two participants argued that there will be no problems if the outcomes are attained. One of them stated:

> What is the request of the school administration? The outcomes that will be attained are defined at the beginning of the year. If students attain these outcomes and more, there will be no problem regarding the school administration. However, if there is deficiency in these gained outcomes, at that time there will be problems [I19].

Whereas two participants have the opinion that it depends on the administration and one of them declared, "It is completely up to the school administration's personal characteristics. I mean, are they open to innovations, do they support computers? If they themselves know

these games, use computers continuously, supporting and installing these will not be so hard" [I20]. Moreover, one of the restrictions was the feasibility of using these games in terms of resources. Four participants reported that there can be many problems of applicability in the schools due to lack of resources, especially computers. One of the participants maintained:

> In general the use of computer laboratories are very problematic in schools. The number of students per computer is limited etc. There become such physical problems. Does the school have enough laboratories, enough computers, enough games, and enough games that are related with each course, each content? These are somewhat more important [I21].

As for another controversial issue is the curriculum. Equal number of participants (2p.) claimed either curriculum is restrictive or not, for teachers to use these games in their courses. To represent, two participants told, "I think the curriculum is so restrictive especially in Turkey" [I22] and "The elementary school level curriculum is not so dense. So such kind of games may be distributed in it. For example, in natural science course, they are lecturing about a subject. If a suitable game is found for it, in a computer course that game can be presented" [I23].

Table 4.38. Perceptions toward the use of these games in the curricula, schools and courses: Advantages and disadvantages.

Statements	F
In terms of time, it is more advantageous to use it in courses	3
In terms of time, there can be problems when using it in courses	8
Classroom management is harder	4
The control of the students' movement is harder	1
Noise is more	2
Classroom management is easier	2
The control of the students' movement in the classroom is easier	1
Noise will be less	1
Students may only focus on the game and always want to play game rather than course	7
Students may not want to turn back to the traditional methods	2
Students may not aware the aim of playing games and play just to play and enjoy	7
If teacher want to use these games, whatever the problems are, (s)he can use it	4
Whether the teacher want to use it or not, there can be problems that may restrict him/her from using these games.	2
School administration will allow teachers to use these games if the outcomes are as intended in the curriculum.	2
Using these games or not is depend on school administration	2
Using them will be harder because the lack of possibilities (such as lack of computer)	4
Curriculum plans will restrict the teacher of using them.	2
Curriculum plans are not so dense, so curriculum will not restrict the teacher of using them	2

4.5.3 Perceptions of Participants in terms of Capabilities of Computer games with Educational Features in Students' Learning

In terms of learning, participants generally expressed more positive opinions than negative ones (See Table 4.39). Fourteen participants out of 16 agreed that computer games with educational features contribute students' learning. Moreover, three participants stated that even they learn more useful things than the traditional system. To illustrate they declared, "Learning occur in a shorter time. Because it is voluntary and it is through multimedia. Since it addresses the eyes, ears and the interest of the student learning is faster and more permanent" [I24], "Student' contribution to her/himself widens the curriculum. I mean, more constructive things are developed rather than only lecturing in classroom environment, which is passed down" [I25].

Also, participants referred to learning by doing (5p.) and learning while enjoying (9p.) issues by, for example, saying "Children learn better while they are doing something, living something. In the game, they become an individual and since they actively participate, these games make students learn better" [I26], "Even us want to learn while enjoying. With this aim, using the educational games is better" [I27]. While many participants (6p.) agreed that the use of computer game increases the psychomotor abilities of students, only 3 participants referred to cognitive learning goals and only 1 participant referred to affective learning goals. Two participants stated, "Students not only learn it cognitively, but also they live and see it. So, I think, it becomes easier for them to visualize and predict" [I28], "I surely believe that they [computer games] have contributions to the psychomotor and affective goals"[I29]. A participant also differentiate the attainment of learning goals according to age of students,

> In elementary school, children have to improve some hand abilities. Keyboard and mouse provide such opportunities easily for these. These games can be used for such kind of improvements at the psychomotor level of the children. For more older students strategy games and games that require thinking should be selected. Because, at that age, developments like cognitive ones begin [I30].

Majority of the participants mentioned about the increased motivation and attention with the use of computer games. According to them, this is a factor for students learn better. One of the participants stated, “I think, the use of these games increases the motivation and willingness. Long-term and intense attention can be attained” [I31]. Another positive effect that is pointed out is the help of these games with stimulating students to think more and make discoveries. A statement explains it as:

> I especially give very much importance to mental activities. Because during that period, mental developments of children are formed. At the same time, children can be lead to think and discover. This method [Using games in education] can be used without any restrictive models like memorization, and it is the one that can change the children’s perspectives and make them to think from many different point of views [I32].

Three participants also touched on the positive effects of using these games on visualization and imagination of the students. For example: “If useful games which includes types that improve intelligence and games that build up the imagination are provided, I think it is useful”[I33], “Students can learn things, that they can not imagine or visualize in their minds, by the help of computer games”[I34].

Besides all of these positive statements about students’ learning, computer games with educational features also perceived as having negative effects on learning from the two perspectives: Prevention of learning other courses when played too much (1p.) and restriction of creativity (1p.). These two participants supported their negative perspectives in this way: “In terms of learning, maybe playing games continuously prevent learning other courses” [I35]. Other participant stated,

For the time being, I do not think to use none of the games that are in the market, or in the software. The reason is that, I think games restrict creativity. If I lectured during a definite time period, for the remaining time, I advocate the students’ use this time creating the games by themselves by using cooperative, psychomotor and cognitive features of them. Even, through the computer, students should prepare it, too. I mean, in an A environment, by

providing a ready-made games and by stating, “the directions are these, the results are those” and in which all of the students in a competition, I think it is very wrong in terms of development [I36].

Table 4.39. The perceptions of participants in terms of capabilities of computer games with educational features in students’ learning

Statements	**F**
Computer games with educational features;	
Positive	
Contribute students’ learning	14
Make students learn more useful things than the traditional system.	3
Make students actively learn by doing	5
Allow students to enjoy when learning	9
Help students fulfill cognitive learning goals	3
Help students fulfill affective learning goals.	1
Help students fulfill psychomotor learning goals.	6
Increase motivation and attention in the course	12
Increase the mental activities of students	3
Lead students to investigate and discover	4
Enrich the fantasy world / imagination of students	1
Increase visualization	2
Negative	
Prevent learning other courses when played too much	1
Restrict the creativity	1

4.5.4. Perceptions of Participants in terms of the Way Computer Games with Educational Features Should be Used in Education to be More Effective in Students' Learning

Very similar statements with the questionnaire are given when participants were asked the way of using these games in courses (See Table 4.40) Fourteen participants stated that the best way of using them is as an aid to practice or reinforce the subject learned previously, while only two participants were in the opinion that the instruction can be conducted through these games, 10 participants disagreed with them. For example two participants expressed, "They should be used as an aid to learning. I do not think it would be effective when learning directly through games." [I37], "The lesson can be conducted through games. In any case it depends on the game" [I38]. Also 11 participants thought that using these games as a reward will be more effective for students' motivation and thus learning. One of the participants stated, "Sometimes computer games are used as a reward. By this way, students orient to course more. 'If I do this, there is a reward in return'." [I39] As for the filling the downtimes or using it in the leisure times, 4 participants supported this idea of using games. A different perspective was presented about using the games in homes (2p.) One participant stated, "These games can be suggested to students to play in their homes. These can be used as a leisure time activity as well." [I40]

Considering the cooperative or competitive environment, more participants preferred cooperative environment that these games are used to be more effective (6p.) than the competitive one (3p.). According to two of these participants, "In terms of education, it will be better if the games are not individually played but played by a group in a group work" [I41], and "Competitions can be arranged" [I42]. As for the goal formation three participants put forward that teacher should determine the goals that students will pursue. One of them expressed his thoughts by referring cooperation and competition, "By using cooperative or competitive methods definite goals should be defined for the students. But, these goals should be determined by the teacher. Moreover, educational aids should be under the control of the teacher" [I43]. However, one participant acknowledged, "Children can be allowed to

choose their own goals. But, in any case, when we allow them to choose, we provide a frame for them. For this reason, it is not inconvenient to allow them to choose. Moreover, I think they will be more motivated if they can select" [I44]

Table 4.40. The perceptions of participants in terms of the way computer games with educational features should be used in education to be more effective in learning (1)

Statements	**F**
Computer games with educational features can be effective in learning,	
when used as a teaching aid in courses.	14
when not used as a main instructional tool in courses	10
when used as the main instructional tool courses	2
when used as a reward in courses.	11
when used to fill the free times of students in courses	4
when used in students homes	2
when used in a cooperative learning environment.	6
when used in a competitive learning environment.	3
when teacher or course determine the goals.	3
when students are allowed to choose their own goals.	1
when scheduled at the end of the course (after the traditional instruction)	8
when used seldom	2
when these games used in accordance with the course goals	9
when these games should be used in accordance with the course content	5
when used in the elementary school to be more effective	6

As for the suitable time of using these games, half of the participants stated specifically that it will be more effective when used at the end of the lesson while nine participants specified the time as well (See Table 4.41). Two participants argued that they should be used not so frequently. To illustrate they stated, “You teach the subject. For the last ten minutes you run the part of the game that is related with that part of the lesson.” [I45] and “I believe that it will contribute to learning unless it is used too often. I mean it will be useful when using without making students habitualize to play games, but seldom, when suitable.” [I46].

Table 4.41. Mentioned times and durations of using computer games in the lesson.

Time of using them	F
During last 5-10 minutes	1
During last 10 minutes	2
During last 10-15 minutes	1
During last 15 minutes	1
During last 15-20 minutes	1
During last 25 minutes	2
During last 10-30 minutes	1

Another mostly stated argument was the suitability of the games with the content (9 p.) and the aim (5 p.) of the lesson or course. They said, “If games with educational features that are not suitable for our aim are used it is a waste of time. If games with educational features that suit our goals, and that serve according to these goals are used, that game is useful” [I47] and “If materials are prepared according to the content of the lesson, and if the elements inside them comprise the content that is taught, only then, game may have educational features” [I48].

Another issue is the level of students. Six participants specifically stated that using these games in the elementary grade levels is more effective. For example one of them asserted, “I advocate the integration of the games into education in the elementary grade levels” [I49].

Statements also indicated that there are many things to be done for an effective learning of students when computer games with educational features are used (See Table 4.42).

Table 4.42. The perceptions of participants in terms of the way computer games with educational features should be used in education to be more effective in learning (2)

Statements	**F**
Good and suitable educational quality games should be selected	11
Games that makes students think should be chosen.	4
Course should be well-planned considering the game	7
The applicability of the games in courses depends on the ability of the teacher	2
Teacher should guide and help students	2
Teacher should inform students about the aims of playing games	2

For example 11 participants noted that good games should be selected and 4 participants noted that the games that require students’ thinking should be used. Also they specified both positive and negative thoughts about some of the games as presented in the Table 4.43. They said: “The game should be selected carefully. Students should not make use of these games for other purposes. So, teacher can reach the goal that is intended, desired and planned” [I50] and “I think it should be used during increasing the mental activities.”[I51]. Moreover, 7 participants stressed the importance of planning by for example stating, “The position of the game should be determined in the plan, and should be thought before” [I52].

Table 4.43 Mentioned game names and types

Mentioned game names and types:		F
Positive	Age of Empires	2
	Strategy Games	3
	Word Zap	1
	Sims	2
	Fantasy Role Playing	1
Negative	Counter Strike	2
	Mario	2
	Racing Games	2

Using these games in the education requires teachers have some skills (2p.). It was asserted that the teacher has the role of a guide (2p.) and informs students about the aims (2p.). Three of the participants stated,

> It is not related with the school administration. In course, if teacher adapt it according to his/her opinions, or if teacher adapt a part of a game by risking the time, students' attention and everything, it is useful then. However, what is important is, to realize it. Because, when students start a game, it is very hard to make them turn back to the lecture again. In fact, the teacher's ability and the quality of the game have deterministic role on these issues according to my opinion [I53].

> I do not believe that games with educational features will be enough solely. Certainly, there is a need for a second person, which is the teacher. Students can realize something at certain points. At least, teacher will help and define the goal. Students may not achieve this when they are alone. [I54]

> We can make the course a game but we can not make the game a course. We can set out from a part of a game, or we can lecture through it. But, the students should not be given the game by only stating, "Folks, this is the game. Play it." The aim of the game should be declared. [I55].

In terms of the games, some of the participants think that games with many levels, or small games that do not require too much time to achieve a goal should be used (4p.) for effective learning in the courses (See Table 4.44). Some participants think that games embedded in the educational software (3p.) and simulation games (2p.) can be used as well. One of the participants expressed his thoughts as:

> The games that I integrate into educational software can be in several levels. When given up at any point in the game, there should be nothing to demotivate the students. I mean, there should not be a unique goal that is attained in three hours. There should be more than one goal. When teacher wants students to abandon playing, the students can. I may think to use such kind of games with levels that lasts short periods [I56].

Regarding the use of simulations, one of the participants stated, "I think simulations have more contribution to the learning for the time being. I know that computer games have been used for training pilots and in several other trainings. I think it is very useful when used in this way"[I57].

Table 4.44. The perceptions of participants in terms of the way computer games with educational features should be used in education to be more effective in learning (3)

Statements	F
Small (or short) games or games with several levels should be used	4
Games in the educational software can be used	3
Simulation games can be used	2

4.5.5. Future Plans Regarding the Use of These Games in Their Courses or in Learning Environments that They will Design.

Nearly all of the participants (14p.) agreed to use the computer games with educational features in their courses or in the learning environments that they will design (See Table 4.45). One of them explained, "I think to use such kind of games but first of all the game should be well-designed and suitable for my aims" [I58]. One participant stated not to use them in the future [I36], and the other participant explain the reason as:

> Even though I object, I know that I have to conform to. For this reason, even I do not want to, I know I have to modify my thoughts, I have to improve myself for this matter. Because, computer and computer games constitutes a big role in our life and people are used to these. We should use them so that it will be included in the education as well. Trying to get people used to another method may take time. It is

wise to use what is present. So, I will try to use them but investing very much control [I59].

Table 4.45. The future plans of participants regarding the use of these games.

Statements	F
Participant will use these games in the future	14
They do not want to but have to	1
They do not want to use market games	1

4.5.6. Other Information Obtained from the Interview

In the Table 4.46, some other information is presented. According to these diverse opinions, some participants argued that there is not any quality research in this area and this method of using games was not tested for their effectiveness. Due to this reason, two participants stated that Ministry of National Education should select and offer games for teachers by providing plans that help teachers to apply in their courses.

Besides, two participants rationalized that the games that students are used to out of school should be used for their education to be more effective. However, other two participants asserted that the integration of computer games in education is hard for today although it may be applicable for the future.

In these diverse opinions, another opinion is about the current computer teachers who are in fact, not graduated from CEIT departments. The participant stated that these teachers use games to escape from teaching something or answering students' questions about the course. Besides, one of the participants asserted that, for students to learn something, the process should be serious.

Table 4.46. Other information obtained from the Interview

Statements	F
More study should be conducted in this area	3
Using these games should be tested first	3
Ministry of National Education should plan the use of these games in courses and suggest games to teachers.	2
Since they are used to play computer games, why not to use it for education	2
Integration of these games in education is hard today, but possible in the future	2
Since most of the current computer teachers are in fact not from CEIT departments, these teachers make students play games to escape from teaching something.	1
If we want to teach or make any modification on students' behaviors, it should be serious.	1

4.5.7. Results of the Questionnaire and the Interview on Sixteen Participants

As presented in the Table 4.47 and 4.48, the mean rates were similar with the actual sample of 116 subjects. Similar proportion of agree-disagree pattern for each question was observed. Moreover, many different explanations were obtained through the interview regardless of the questions in the questionnaire. So, these responses were not exactly the same or include all of the items in the questionnaire, they provided new perspectives.

Table 4.47. Questionnaire results: General perception about playing games of sixteen participants who participated to the Interview

	SD	D	A	SA	Mean	StanD
P1-Q24) Playing computer games is an important leisure time activity.	3	8	5	0	2,13	0,72
P1-Q25) Playing computer games is a waste of time.	1	5	9	1	2,63	0,72
P1-Q26) Playing computer games requires too much engagement time.	0	1	12	3	3,13	0,50
P1-Q27) Playing computer games stimulate curiosity in learning something.	1	7	8	0	2,44	0,63
P1-Q28) Playing computer games help developing some useful knowledge and skills.	0	5	11	0	2,69	0,48
P1-Q29) Playing computer games is suitable for only children (elementary & secondary school).	4	11	1	0	1,81	0,54
P1-Q30) Playing computer games is suitable for every age group.	0	3	9	4	3,06	0,68
P1-Q31) Girls and boys prefer playing different types of computer games.	0	3	9	4	3,06	0,68
P1-Q32) Playing computer games leads to addiction.	1	2	10	3	2,94	0,77
P1-Q33) Playing computer games affect the social life of the people negatively.	2	3	7	4	2,81	0,98
P1-Q34) When computer games are played with a group (friends, family), it helps development of social skills.	0	6	9	1	2,69	0,60
P1-Q35) Playing violent games affect people negatively.	1	2	6	7	3,19	0,91

Table 4.48. Questionnaire results: Perception, toward the use of these games in education, of sixteen participants who participated to the Interview.

	SD	D	A	SA	Mean	StanD
Computer games with educational features;						
P2-Q1) can be applicable to all subject matters.	0	4	11	1	2,81	0,54
P2-Q2) can be applicable to all grade levels.	0	3	12	1	2,88	0,50
P2-Q3) can be used in accordance with the goals of schools' curriculum plans.	0	0	12	4	3,25	0,45
P2-Q4) can be used without causing any problem with the schools' curriculum plans in terms of time.	0	2	14	0	2,88	0,34
P2-Q5) can be used without causing any problem with the schools' curriculum plans in terms of classroom management	0	1	14	1	3,00	0,37
P2-Q6) can help students fulfill cognitive learning goals which are defined in the schools' curriculum plans.	0	2	12	2	3,00	0,52
P2-Q7) can help students fulfill affective learning goals which are defined in the schools' curriculum plans.	0	6	9	1	2,69	0,60
P2-Q8) can help students fulfill psychomotor learning goals that are defined in the schools' curriculum plans.	0	4	11	1	2,81	0,54
P2-Q9) can be effective in learning when used as a teaching aid in courses.	0	1	11	4	3,19	0,54
P2-Q10) can be effective in learning when used as a main instructional tool in schools.	1	12	3	0	2,13	0,50

Table 4.48. (Continued)

	SD	D	A	SA	Mean	StanD
Computer games with educational features;						
P2-Q11) can be effective in learning when used as a reward in courses.	0	1	12	4	3,19	0,54
P2-Q12) can be effective in learning when used to fill the free times of students in courses	1	7	7	1	2,50	0,73
P2-Q13) can be effective in learning when they provide cooperative learning environment.	0	3	11	2	2,94	0,57
P2-Q14) can be effective in learning when they provide competitive learning environment	0	6	7	3	2,81	0,75
P2-Q15) can be effective in learning when a goal is specified in a game.	0	2	11	3	3,06	0,57
P2-Q16) can be effective in learning when a goal is not specified in a game.	3	12	1	0	1,88	0,50
P2-Q17) can be effective in learning when students are allowed to choose their own goals in a game.	0	4	10	2	2,88	0,62
P2-Q18) can be effective in learning when they are based on realistic goals.	0	1	10	5	3,25	0,58
P2-Q19) can be effective in learning when they are based on fantasy goals.	2	6	6	2	2,50	0,89

CHAPTER 5

DISCUSSION AND CONCLUSION

This chapter discusses the major findings with regard to the research questions posed. Implications for research and practice and recommendations for further research are also addressed.

5.1. Discussion and Conclusion

This study reveals that the participants of this study have positive perceptions toward the use of computer games with educational features in education. Moreover, most of them plan to use such games in their future professions according to their responses. However, it is revealed that participants also have doubts about some issues regarding the use of such games in education, although this is a rare case.

5.1.1. Subjects' Access, Previous and Current Experience of Games, Preferences of Games and Game Types

Experience with computer games may have influence on subjects' perspectives toward these games. Anything that may lower the subjects' experiences of such kind of games, either external restrictions or their own preferences, may narrow the perspective of

the respondents in their perceptions. Likewise, anything that may increase their experiences of such kind of games may widen the perspectives of the respondents in their perceptions.

Regarding this point of view, as an internal effect of experience, it is provided that, nearly all of the subjects (93%) have some experiences with either computer games or other platform games, which are very similar to the computer games according to Durkin and Barber (2002). However, the extent of time playing these games differs. Moreover, it is revealed that currently 64% of the subjects spend some time with playing computer games among other leisure time activities. However, the time spent for computer games activity is shorter than all other activities defined, such as using computer, social activities, watching television and reading non-assigned books regarding the mean scores. Even though they spend less time for playing games, it can be asserted that playing computer games become another type of leisure time activity that prospective computer teachers experience. This finding is parallel to the research conducted by Media Analysis Laboratory (1998). However, regarding this study, the time allocations are different and the subjects have different demographic characteristics.

Regarding the computer games and computer relation, the age of starting using computer is very similar to the age of starting playing computer games. This can be considered as an evidence that, playing computer games help students to increase interest in using computers as well as developing some skills for using them as Subrahmanyam et al. (2001) and Prensky (2001) propose.

As for the possession of computer games, subjects have average number of computer games (5-10). However, it is not definite that whether these games are from different types or in different qualities, which are important for subjects' general perceptions about computer games. Because, the more diverse the computer games they experience, the wider their perspectives may be. From this standpoint, it is proved out that most of the subjects prefer violent games that have little or no educational features (Appendix D). In terms of types, the mostly rated one is the action game type that is also mostly preferred by males

according to Media Analysis Laboratory Research (1998). It may be argued that our findings are very parallel with findings of other studies that were conducted in other countries in terms of action game type preference. Secondly selected game type is strategy games that are stated to be effective to be used in education during the interview. So, action and strategy game types which are preferred by prospective teachers of four universities, may indicate that such types can be suitable to be used for educational purposes for these subject groups.

Other factors that may determine the experience of subjects in playing computer games are the external factors, besides subjects' own voluntary experiences. In terms of ownership of computers there is not so much restrictions found. The reason of this situation can be easily interpreted that, since the subjects' undergraduate program requires the use of computers much, most of them have their own computers. This is not the case as technical capabilities of computers are taken into consideration. Nearly 34% of the subjects have some restrictions due to such inconvenience issues to play different kinds of games.

Regarding the permission restrictions, 42% of the subjects who play computer games have some permission problems although the extent differs. The reason for such a restriction may be due to the fact that, subjects generally use computers in the university computer laboratories in which the setup of any program is not allowed. Moreover, in many laboratories there is a rigid rule for not playing computer games.

So, all of these external restrictions which have influence on the subjects' experiences with diversity of computer games may have some influences on subjects' opinions and perceptions toward playing these games. Besides their lack of experience to evaluate the games from different perspectives, they may also think that it is not socially acceptable and suitable activity, since it is prohibited in some places. Regarding the restrictions originated from social beliefs, respondents may have negative attitudes toward computer games; or conversely, this restrictions may lead them to incline toward positive attitudes.

5.1.2. Subjects' General Perceptions Toward Computer Game Playing

Subjects' perceptions toward the use of computer games with educational features in education may have some relations with their general perceptions toward computer game playing. Examination of the general perceptions of subjects reveals that, there is an inconsistency in the responses although positive perception items are rated mostly. While most of the subjects rate that playing computer games is not an important leisure time activity, and half of the subjects rate these games as time wasters, they have the opinion that these games stimulate curiosity in learning besides they help developing some useful skills and knowledge. So, there is a dilemma considering the ratings of the importance of games in general, and the importance of games in learning. Furthermore, they respond that playing computer games requires too much engagement time. If this is the case, considering the defined dilemma, subjects perceived that students either waste that amount of time by playing these games, or they learn something useful by spending a lot of time. This dilemma may be due to their confusion of thoughts about their own definition of games as either recreational games or educational games. As Price (1990) describes, many educators generally perceive recreational games as waste of time while educational games as important instructional means.

Many other general perception items are rated in accordance with the negative social beliefs, such as playing games lead to addiction (Media Analysis Laboratory, 1998), it affects the social life negatively (Anderson & Bushman, 2001; Chroy-Assad, 2000), violent games have negative effects on people (Anderson & Bushman, 2001) etc. In general, it may be rationalize that these negative perceptions have been affected by the social beliefs of people around or by television, magazines or journals that mostly present the negative effects of computer games.

5.1.3. Subjects' Perceptions Toward the Use of Computer Games with Educational Features In Education

Results of the collected data have shown that subjects have positive perceptions toward the use of computer games with educational features in education.

As for the perceptions of subjects in terms of the students' and teachers' thinking of the use of computer games with educational features in education, students (70% ratings) are perceived as having more positive thoughts than their teachers (54% ratings). Furthermore, while majority of the subjects (47%) think that both teachers and students have positive thoughts, some of the subjects (12%) think that either teachers or students have some negative thoughts about the use of computer games with educational features in education.

Teachers are also perceived as having more neutral thoughts and both positive and negative thoughts than students regarding the use of these games in their courses. This may be interpreted that the subjects also have some doubts about the use of these games in courses or they want to show that they are aware of the negative or positive consequences of the games by considering different perspectives. Moreover, these responses may illustrate that teachers are more cautious and thoughtful about it. Besides, it may be due to the fact that they feel more responsibility about students' learning with this new method and the effectiveness of this new method, than the students many of whom enjoy playing computer games.

Firstly, considering the suitability of these games to all subject matters and grade levels, as Gredler (1994) and Prensky (2001) propose, subjects reported that they are applicable. However, many subjects generally mentioned that games may support other courses rather than the computer courses. Furthermore, the mostly mentioned issue related with the computer courses was the developing skills for using mouse or keyboard, which was also identified by Prensky (2001). It is apparent that, they do not think computer games may be used in computer literacy courses and help students to achieve other related goals, rather than just psychomotor goals. Yet, some of the respondents describe that playing these games

help students to be acquainted with computers as Subrahmanyam et al. (2001) explain. As for suitable grade levels, although majority of the subjects think that they can be applicable to all grade levels and all age groups, what is stressed in the responses and examples given to the open-ended questions and interview is the importance that the games should be used in lower grades to be more effective. Similarly, Rieber (1996) argue that teachers generally think, these games are effective mostly in elementary school level.

Majority of the subjects' are also in the opinion that these games can be used in accordance with the curriculum plans in terms of time, goals, and classroom management, without causing any problems. Yet, qualitative analysis reveals variety of doubts or negative perceptions about the time, accordance with the goals, suitability of the games with students' levels, comprehensiveness of the games, awareness of the students about the aim, students' benefit from the games and classroom management issues, nevertheless there are few ratings. These drawbacks however, have effects on the applicability of any change in the education system (Prensky, 2001). All of these doubts may be raised due to "Fear of unknown" defined by Lunenburg and Ornstein (1996); which is one of the causes for resistance to change in educational systems. These teachers may fear that the stable system that they have grown up throughout the undergraduate education will be upset, and for this reason, they concern about how they will deal with an innovative environment that they have not tested or practiced before. Competency is the key issue for such considerations as Dusick and Yıldırım (2000) examined regarding the use of computers by teachers in their courses. Yet, many subjects consider to spend effort overcome and eliminate such negative consequences and they explained what they would do to prevent such issues.

Considering the capabilities of such games in helping students to fulfill the educational learning goals that are defined in the schools' curricula, subjects have positive perceptions. Majority of the respondents stated that they believe the contribution of these games on students' learning which is parallel with Cole (1996 cited in Subrahmanyam et al. 2001) who examined the long-term effects of these games on learning. Subjects reported that

these games can help students to fulfill the cognitive, affective and psychomotor goals defined in the curriculum plans. Besides, the respondents are in the opinion that students' motivation and attention are increased; they learn many useful information and skills; they also apply them actively when they enjoy the learning process. Active involvement in the learning process allows the best learning to take place according to Prensky (2001). Regarding this perspective, some subjects may perceive computer games with educational features as providing the best learning to take place. Furthermore, many participants describe their perceptions that, students feel enjoyment and want every course teacher use such games. Besides, many subjects stated that students prefer this kind of activities in their courses rather than traditional education. As their motivation is increased, the students are thought to learn better as Prensky, 2001, Rieber, 1996 and Rosas et al. 2003 described.

Moreover, many respondents stated that not only the content of the lesson is learnt more successfully, but also many useful things are learnt as well, such as thinking strategies (as Rieber, 1996), eye-hand coordination (as Prensky, 2001), visualization (as Subrahmanyam et al. 2001), discovery skills (as Gorriz & Medina, 2000), creativitiy (as Prensky, 2001) etc. Furthermore, they think that this kind of learning environment is more effective for students' learning.

Regarding the way of using computer games with educational features in education, subjects who answered the question of 'how you will use them in your future profession' generally gave comprehensive responses for the way of using such games to be more effective in students' learning. Considering all of these responses, most of the subjects are in the opinion that, such games should be used as a teaching aid tool or reward rather than the main instructional tool to be more effective in students' learning. Such purposes to use such games in courses are also defined by Gredler as "to practice and/or refine knowledge/skill already acquired, to develop new relations among concepts and principles" and as a "reward" (Gredler, 1996, 1994). Especially they are in the opinion that games can be used as a motivator to increase their interest and attention to the course. This may be interpreted that,

subjects do not want to give all the control to these computer games. Although they have positive perceptions about using these games in the courses, they generally think of using them as a complementary activity in which the teachers' role is a guide and helper. However, for the remaining time of the lesson, they generally think to use the traditional methods and other activities in which the teachers' role is not definite. Prensky (2001), as well, advises that computer games can be used with other methods that include teachers.

This is also consolidated regarding the goal formation. From their responses, it is evident that they prefer teachers define the goals or curriculum plans. Moreover, they think that they will spend effort to use games in accordance with the goals of the lesson, and put effort to make students aware of these goals.

As for the nature of the goals, more subjects think that games with reality-based goals will be more effective than fantasy based goals although both of them are rated as effective in students' learning. This can be explained by their responses in the interview as; while some of the students give importance on real-life simulations, others give importance on the effects of such games to increase students' power of imagination.

Besides, they think that games will be more effective in a cooperative learning environment, than in a competitive one, although both of them are perceived as effective in students' learning. As for students' perceived thoughts, subjects illustrated that students generally play games in a more competitive environment than the cooperative one. Maybe, for that reason, they think that providing much cooperative environment for them will be helpful besides competitive one. This thought is also supported by Heinich et al. (1996) as, more cooperative games which were aimed to improve interpersonal skills have been developing recently. Similarly, Rosas et al. (2003) argue that the cooperation among students when playing computer games increases the social support.

As for time considerations, qualitative analysis results show that some participants think, small proportion of time at the end of the lesson is suitable for game playing. Besides, some subjects stress that these games should not be used frequently and students should not

get used to playing games. However, these opinions have a few ratings but important in some aspects. First of all, these opinions may be caused due to their perception that, computer games are not perceived as effective as traditional education and for that reason they should not be used much as a substitute of traditional learning activities. Secondly, these opinions are supported regarding the subjects' stated purpose of using these games in courses as teaching aid or reward but not as a main instructional tool.

Regarding the game type that they think to be more useful, it is reported that short games that do not take much time can be applicable, similarly as in the time consideration. Moreover, simulation games thought to be effective. Many of the participants also stressed the importance of game selection. According to them, the games should be relevant, suitable for goals as Prensky (2001) explained, and in high quality in terms of education. Because they think that all games are not valuable and useful as reported by Rieber (1996) and Subrahmanyam et al. (2001). Subject also give importance to the planning issues to make the activity as effective as possible.

From the overall perspective, CEIT students are expected to have positive attitudes toward technology and computer usage in courses. Their perceptions of using computer games with educational features in courses may be positive due to their positive attitudes toward technology integration in education.

5.1.4. Subjects' Future Plans Regarding the Use of Computer Games with Educational Features in Their Courses or in Learning Environments which They will Design

Most of the subjects (83%) remarked that they are planning to use such games for their future profession. However, the actual rate may be lower. Regarding their perceived power of changing the current situation, while some respondents are in the opinion that, if teachers want and decide to use these games in their courses, they can use them by eliminating any problems occur. On the other hand, some other respondents stated that, when they will start their profession, they may not use these games even they want to use them,

because of some restrictions that they may encounter, such as lack of resources, restrictions from school administration or curriculum. Yet, as stated in OTA (1995), the availability of the resources is not an indicator that teachers will use them or use them effectively. Teachers' attitudes and opinions toward the innovations, technology and games are important elements for realizing the plans but not sufficient.

Moreover, considering the research study that Marcinkiewicz (1995) conducted, it reveals that, while half of the practicing teachers do not use computers in their courses at all, preservice teachers think that they will use it more. If the same issue is applicable for the computer games, the proportion of these voluntary prospective teachers may be decreased.

As for how they will use them, their answers in the interview and the open-ended question in the questionnaire are generally given in combination with the answers to 'how it should be used to be more effective'. For this reason, all of these responses are provided in the previous section.

Yet, considering their future plans, they generally think to use computer games. Besides they think that using them will be useful for creating more effective and rich learning environment.

5.2. Implications for Research and Practice

This survey research study provides a base by documenting descriptive information about perceptions of prospective computer teachers toward the use of computer games with educational features in education. Since there is a gap in the literature about this issue, this study may contribute to the literature, moreover, it may be represented as the pioneer study that will incite further research studies in this area. By exposing this overall perspective, other researchers who examine the details of this perspective, or conduct inferential studies may make use of this study. Moreover, it may be a representative study to be compared with similar studies.

Regarding the practice, this study may provide evidence for future actions of educational system. Before realizing any plan or thought about using computer games with educational features in education, education system may make use of this study and further studies inspired from this study, for taking safer actions. Because, without knowing perceptions of prospective teachers, who have the power of changing the picture of future, any change without any research support, will end up with vain efforts and time wasted as well as confusion. Utilizing this study may contribute to the decisions of planners and also other educators.

Similarly by knowing the future plans of these participants, educators and planners may better visualize the future role of computer games in educational system.

Furthermore, by knowing the game playing characteristics of prospective computer teachers, who have the conjunction role of both teachers and students, the educators' awareness about the differences in the experiences between new and old generation students and teachers may be increased.

Lastly, through this study, participants who are the future computer teachers, have another opportunity to think about, investigate and become aware of their own perceptions and perspectives toward the use of computer games in their courses or learning environments that they will design as one of the respondents explain as: "I did not think about this issues before, but it should be thought. It can be thought about how [these games] should be integrated" [IE1- Appendix F].

5.3. Recommendations for Further Research

Further research needs to be done in this area in order to see if these results can be generalizable to other prospective computer teachers other than these subjects. Moreover further studies need to be conducted for other prospective teachers from other disciplines and from other universities.

A correlational analysis can be conducted to determine whether there are some relationship between the subjects' perceptions toward the use of these games in education and their experiences with the computer games and their general perceptions toward playing games.

A longitudinal study can be conducted using the same subjects in combination with this research, to determine whether they will use the computer games with educational features in their courses as a practicing teacher. Moreover, their competence and confidence toward the use of these games in their courses may be researched.

More studies can be conducted regarding the social aspect of learning by the help of computer games with educational features by examining the prospective computer teachers' perceptions about multiplayer-online games.

By including more relevant questions from different perspectives, the items in the questionnaire and interview schedule can be widened to better proximate the actual perceptions of subjects.

In depth qualitative study can be conducted regarding the results of this study. Especially about doubts and negative perceptions that are found through the qualitative analysis.

Further studies can be conducted that investigate the perceptions of students' parents. Moreover, the perceptions of students from different demographic characteristics can be examined.

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APPENDIX A

QUESTIONNAIRE

ANKET

YÖNERGE

Bu anket, üniversitelerin BÖTE (Bilgisayar ve Öğretim Teknolojileri Eğitimi) bölümlerindeki bilgisayar öğretmeni adaylarının bilgisayar oyunlarını oynamaya yönelik özelliklerini, eğitici yönleri olan bilgisayar oyunlarının eğitimde kullanılmasına yönelik algılarını, ve bu öğrencilerin eğitici özellikleri olan bilgisayar oyunlarını derslerinde kullanmalarına yönelik planlarını araştırmak amacıyla hazırlanmıştır.

Kişisel bilgileriniz ve cevaplarınız kesinlikle gizli tutulacak ve sadece araştırma amaçlı kullanılacaktır.

Araştırma sonuçlarını öğrenmek isteyip istemediğinizle ilgili tercihinizi aşağıdaki iki kutudan birini işaretleyerek belirtiniz.

☐ Çalışmanın sonuçları hakkında bilgilendirilmek istiyorum. E-Posta: .....

☐ Çalışmanın sonuçları hakkında beni bilgilendirmenize gerek görmüyorum.

Katılımınız için teşekkür ederim.

Gülfidan CAN

ODTÜ – Bilgisayar ve Öğretim

Teknolojileri Eğitimi Bölümü

Lütfen soruları eksiksiz doldurunuz.

BÖLÜM 1

1) Yaş :.....

2) Cinsiyet: ☐ Bayan ☐ Bay

3) Doğum Yeri : Şehir / Ülke : .....

4) Aylık ortalama geliriniz ne kadardır? (burs, kredi, aile yardımı vs. dahil)

a) 150 milyonTL' den az
b) 150-200 milyonTL
c) 200–250 milyonTL
d) 250–300 milyonTL
e) 300 milyonTL'den fazla

5) Okumakta olduğunuz üniversite:

a) Ankara Üniversitesi
b) Gazi Üniversitesi
c) Hacettepe Üniversitesi
d) Orta Doğu Teknik Üniversitesi

6) Lisans öğreniminizde (hazırlık hariç) kaçıncı yıl ve döneminiz? Yıl / dönem :...../.....

7) Genel not ortalamanız: ...../..... (örneğin, 3,20 / 4,00 75,5 / 100)

8) Kendinize ait bir bilgisayarınız var mı?

☐ Hayır ☐ Evet

9) Genelde nerede bilgisayar kullanırsınız? Birden fazla seçeneği işaretleyebilirsiniz.

☐ Ev
☐ Üniversite Bölümlerindeki Bilgisayar Laboratuarları
☐ İnternet Café
☐ Yurt
☐ Diğer :.....

10) Bilgisayarı en fazla kullandığınız yerde bilgisayar oyunu oynamanıza izin veriliyor mu?

a) Hayır, hiç bir zaman
b) Nadiren
c) Bazen
d) Çoğu zaman
e) Evet, her zaman
f) Bilgisayar oyunu oynamıyorum

11) Kullandığınız bilgisayarların teknik özellikleri bilgisayar oyunu oynamak için yeterli mi?

a) Hayır,yetersiz b) Bazı oyunlar için yeterli c) Evet,yeterli d) Bilmiyorum

12) Yaklaşık kaç bilgisayar oyununuz var?

a) Hiç b) 5'ten az c) 5-10 d) 10-15 e) 15-20 f) 20'den fazla

13) Bilgisayar kullanmaya kaç yaşında başladınız?

a) 20 yaşından sonra
b) 15 - 20 yaş arasında
c) 10 - 15 yaş arasında
d) 5 - 10 yaş arasında
e) 5 yaşından önce

14) Bilgisayar oyunu oynamaya kaç yaşında başladınız?

a) Hiç bilgisayar oyunu oynamadım.
b) 20 yaşından sonra
c) 15 - 20 yaş arasında
d) 10 - 15 yaş arasında
e) 5 - 10 yaş arasında
f) 5 yaşından önce

15) Bilgisayar **dışındaki** elektronik ortamlarda oynanan oyunları (Atari, gameboy, playstation gibi) ilk defa kaç yaşındayken oynadınız?

a) Bu tür oyunları hiç oynamadım.
b) 20 yaşından sonra
c) 15 - 20 yaş arasında
d) 10 - 15 yaş arasında
e) 5 - 10 yaş arasında
f) 5 yaşından önce

16) Yaklaşık kaç yıl bilgisayar oyunu oynadınız veya kaç yıldır oynuyorsunuz?

a) Hiç bilgisayar oyunu oynamam/ oynamadım
b) 1 yıldan az
c) 2-3 yıl
d) 4-5 yıl
e) 6-7 yıl
f) 8 yıldan fazla.

17) Bilgisayar **dışındaki** elektronik ortamlarda oynanan oyunları (Atari, gameboy, playstation gibi) yaklaşık kaç yıl oynadınız veya kaç yıldır oynuyorsunuz?

a) Bu tür oyunları hiç oynamam/ oynamadım
b) 1 yıldan az
c) 2-3 yıl
d) 4-5 yıl
e) 6-7 yıl
f) 8 yıldan fazla

Aşağıda verilen boş zaman değerlendirme sorularını okuyarak, size uygun olan ilgili saat alanını X ile işaretleyiniz.

	Saat					
Son zamanlarda, genellikle haftada kaç <u>saat ;</u>	**Hiç**	**<1**	**1-5**	**5-10**	**10-15**	**>15**
18) bilgisayar kullanıyorsunuz? (ödev, araştırma vs gibi okul çalışmalarınız dışında)						
19) bilgisayar oyunu oynuyorsunuz?						
20) bilgisayar **<u>dışındaki</u>** elektronik ortamlarda oynanan oyunları (Atari, gameboy,playstation gibi) oynuyorsunuz?						
21) televizyon izliyorsunuz?						
22) ders kitapları dışında kitap okuyorsunuz?						
23) sosyal etkinliklere katılıyorsunuz?(ailenizle, arkadaşlarınızla)						

Aşağıda verilen cümleleri okuyarak, size uygun olan tek bir yanıtı X ile işaretleyiniz.

	Kesinlikle Katılmıyorum	**Katılmıyorum**	**Katılıyorum**	**Kesinlikle Katılıyorum**
24) Bilgisayar oyunu oynamak önemli bir boş zaman değerlendirme uğraşıdır.				
25) Bilgisayar oyunu oynamak vakit kaybıdır.				
26) Bilgisayar oyunu oynamak çok vakit alan bir uğraşıdır.				
27) Bilgisayar oyunu oynamak insanlarda bir şeyler öğrenmeye karşı merak uyandırır.				
28) Bilgisayar oyunu oynamak bazı yararlı bilgi ve becerilerin gelişmesine yardım eder.				
29) Bilgisayar oyunu oynamak **<u>sadece</u>** küçük yaşlardaki çocuklar için uygundur. (ilk ve orta okul çocukları)				
30) Bilgisayar oyunu oynamak her yaş grubu için uygundur.				
31) Kızlar ve erkekler farklı türde bilgisayar oyunlarını oynamayı tercih ederler.				
32) Bilgisayar oyunu oynamak bağımlılık yapar.				
33) Bilgisayar oyunu oynamak kişilerin sosyal yaşamını olumsuz yönde etkiler.				
34) Bilgisayar oyunları bir grup (arkadaş grubu, aile vs.) ile birlikte oynandığında kişilerin sosyal becerilerinin gelişmesini sağlar.				
35) Şiddet unsuru içeren bilgisayar oyunlarını oynamak, insanları olumsuz yönde etkiler.				

36) Eğer varsa, en sevdiğiniz bilgisayar oyunlarının isimlerini yazınız.

>

37) Genellikle ne türde/türlerde bilgisayar oyunlarını seversiniz? Birden fazla tercihiniz varsa kutuların içine **TERCİH <u>SIRASInı</u>** yazınız. (1 en yüksek tercih, 2,3, ... şeklinde)

◯ Bilgisayar oyunu oynamam.

☐ **Aksiyon Oyunları:** Süratli ve ani oyunlardır. Örneğin, labirent oyunları, ateş ettiğiniz oyunlar, araba yarışları, ve takip oyunları bu kategoridedir. Örnek oyunlar: Super Mario, PacMan, Missile Command, Doom, Quake, Half-Life, Unreal Tournament, Hitman vs.

☐ **Macera Oyunları:** Bilinmeyen dünyada yolunu bulma, nesneleri toplama, ve bilmeceleri çözme oyunlarıdır. Örnek oyunlar: Zork, Myst and Riven, Indiana Jones, Where in the World is Carmen Sandiego vs.

☐ **Dövüş Oyunları**: Hızlı ve atletik hareketlerin olduğu oyunlardır. Örnek oyunlar: Mortal Kombat, Virtual Fighter vs.

☐ **Bilmece Oyunları**: Çözülmesi gereken problemler içerir. Genellikle görseldir. Örnek oyunlar: Tetris, Devil Dice vs.

☐ **Rol-Oynama Oyunları:** Bu oyunlarda, kendinizce belirlenen özellikleri ve kendine has özellikleri olan roller (insan, peri, büyücü vs.) oynanır. Örnek oyunlar: Ultima, EverQuest, Diablo, Wizards and Warriors vs.

☐ **Simulasyon Oyunları**: Bir aracı kullanmak, uçurmak, ya da dünyalar kurmakla alakalı oyunlardır. Örnek oyunlar: Sim City, The Sims, Flight Simulators vs.

☐ **Spor Oyunları**: Örnek oyunlar: FIFA, NBA, Skating, Tennis, Baseball, Golf, Skiing oyunları vs.

☐ **Strateji Oyunları**: Büyük bir şeylerin sorumluluğunu almak (örneğin bir ordu, ya da bir uygarlık) ve onu istediğiniz şekilde geliştirmekle ilgili oyunlardır. Örnek oyunlar: Civilization, Roller Coaster Tycoon, Age of Empires vs.

◯ Bunların dışında farklı türde bilgisayar oyunu oynuyorum. Türü:.....

BÖLÜM II

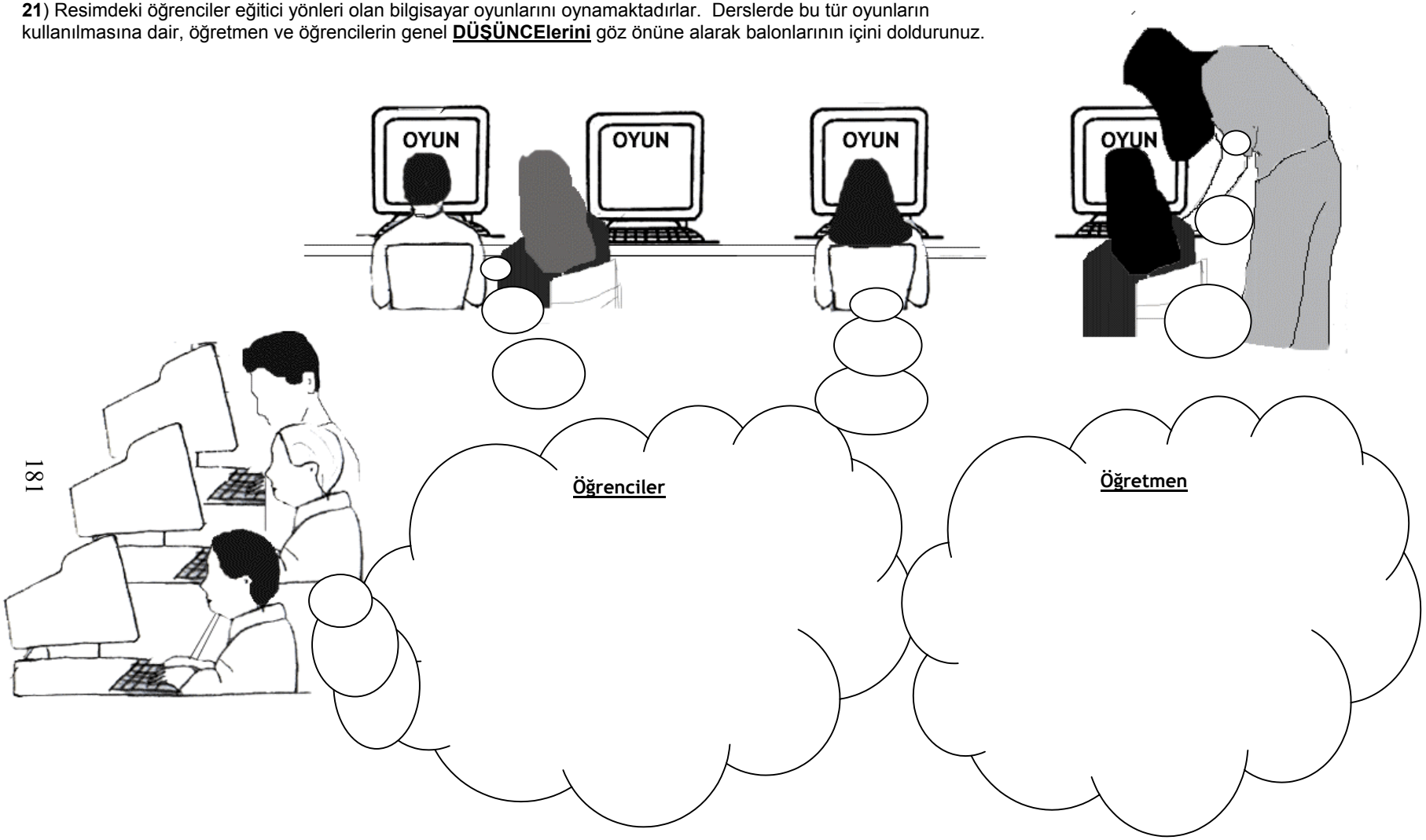
Aşağıda verilen cümleleri okuyarak, size uygun olan tek bir yanıtı X ile işaretleyiniz.

<u>Eğitici yönleri olan</u> bilgisayar oyunları;	**Kesinlikle Katılmıyorum**	**Katılmıyorum**	**Katılıyorum**	**Kesinlikle Katılıyorum**
1) tüm derslere uygulanabilir.				
2) tüm öğrenim düzeylerine uygulanabilir.				
3) okullardaki eğitim programlarının amaçlarıyla paralel kullanılabilir.				
4) okullardaki eğitim programlarında zaman konusunda sorun yaratmayacak şekilde kullanılabilir.				
5) okullardaki eğitim programlarında sınıf yönetimi konusunda sorun yaratmayacak şekilde kullanılabilir.				

<u>Eğitici yönleri olan</u> bilgisayar oyunları;	**Kesinlikle Katılmıyorum**	**Katılmıyorum**	**Katılıyorum**	**Kesinlikle Katılıyorum**
6) öğrencilerin, okulların müfredatlarında tanımlanan bilişsel öğrenme amaçlarına ulaşmalarına yardım edebilir.				
7) öğrencilerin, okulların müfredatlarında tanımlanan duyuşsal öğrenme amaçlarına ulaşmalarına yardım edebilir.				
8) öğrencilerin, okulların müfredatlarında tanımlanan devinişsel öğrenme amaçlarına ulaşmalarına yardım edebilir.				
9) derslerde öğretime yardımcı olarak kullanıldığında öğrenmede etkili olabilir.				
10) derslerde asıl öğretim aracı olarak kullanıldığında öğrenmede etkili olabilir.				
11) derslerde bir ödül olarak kullanıldığında öğrenmede etkili olabilir.				
12) derslerde, öğrencilerin boş zamanlarını doldurmak için kullanıldığında öğrenmede etkili olabilir.				
13) işbirlikçi öğrenme ortamı sağladığında öğrenmede etkili olabilir.				
14) yarışmacı öğrenme ortamı sağladığında öğrenmede etkili olabilir.				
15) oyunda belirli bir hedef verildiğinde öğrenmede etkili olabilir.				
16) oyunda belirli bir hedef veril**<u>me</u>**diğinde öğrenmede etkili olabilir.				
17) oyunda öğrencilerin kendi hedeflerini seçmelerine izin verildiğinde öğrenmede etkili olabilir.				
18) gerçekçi amaçlara dayandıklarında öğrenmede etkili olabilir.				
19) düşsel/fantezi amaçlara dayandıklarında öğrenmede etkili olabilir.				

20) Meslek hayatınızda derslerinizde veya tasarlayacağınız öğrenim ortamlarında eğitici yönleri olan bilgisayar oyunlarını kullanmayı düşünüyor musunuz? Yanıtınız evet ise nasıl kullanmayı düşünüyorsunuz? Yanıtınız hayır ise neden kullanmayı düşünmüyorsunuz?

21) Resimdeki öğrenciler eğitici yönleri olan bilgisayar oyunlarını oynamaktadırlar. Derslerde bu tür oyunların kullanılmasına dair, öğretmen ve öğrencilerin genel **DÜŞÜNCElerini** göz önüne alarak balonlarının içini doldurunuz.



APPENDIX B

INTERVIEW SCHEDULE

Entrance Question (that make participants think about games with educational features): Bazı bilgisayar oyunlarının eğitici yönleri olması konusunda ne düşünüyorsunuz?

1. Eğitici yönleri olan bilgisayar oyunlarının eğitimde kullanılmasının öğrencilerin daha iyi bir şekilde öğrenmelerine katkıda bulunacağına inanıyor musunuz?

1.1.1. Evet > Neden?

1.1.2 Sizce bu tür bilgisayar oyunlarının eğitimde kullanılmasının öğrencilerin öğrenimi açısından dezavantajları da olabilir mi?

1.2.1. Hayır > Neden?

1.2.2. Sizce bu tür bilgisayar oyunlarının eğitimde kullanılmasının öğrencilerin öğrenimi açısından avantajları da olabilir mi?

2. Eğitim programlarının amaçları açısından, zaman açısından ve okul (ya da sınıf) yönetimi açısından sizce, bu tür oyunların eğitim programlarına entegrasyonu uygun mudur?

2.1. Evet> Neden?

2.2. Hayır >Neden?

3. Sizce bu tür oyunlar, öğrencilerin öğrenmelerine katkıda bulunacak şekilde eğitimde (ya da derslerde) nasıl kullanılmalıdır?

4. Siz meslek hayatınızda derslerinizde veya tasarlayacağınız öğrenim ortamlarında bu tür bilgisayar oyunlarını kullanmayı düşünüyor musunuz?

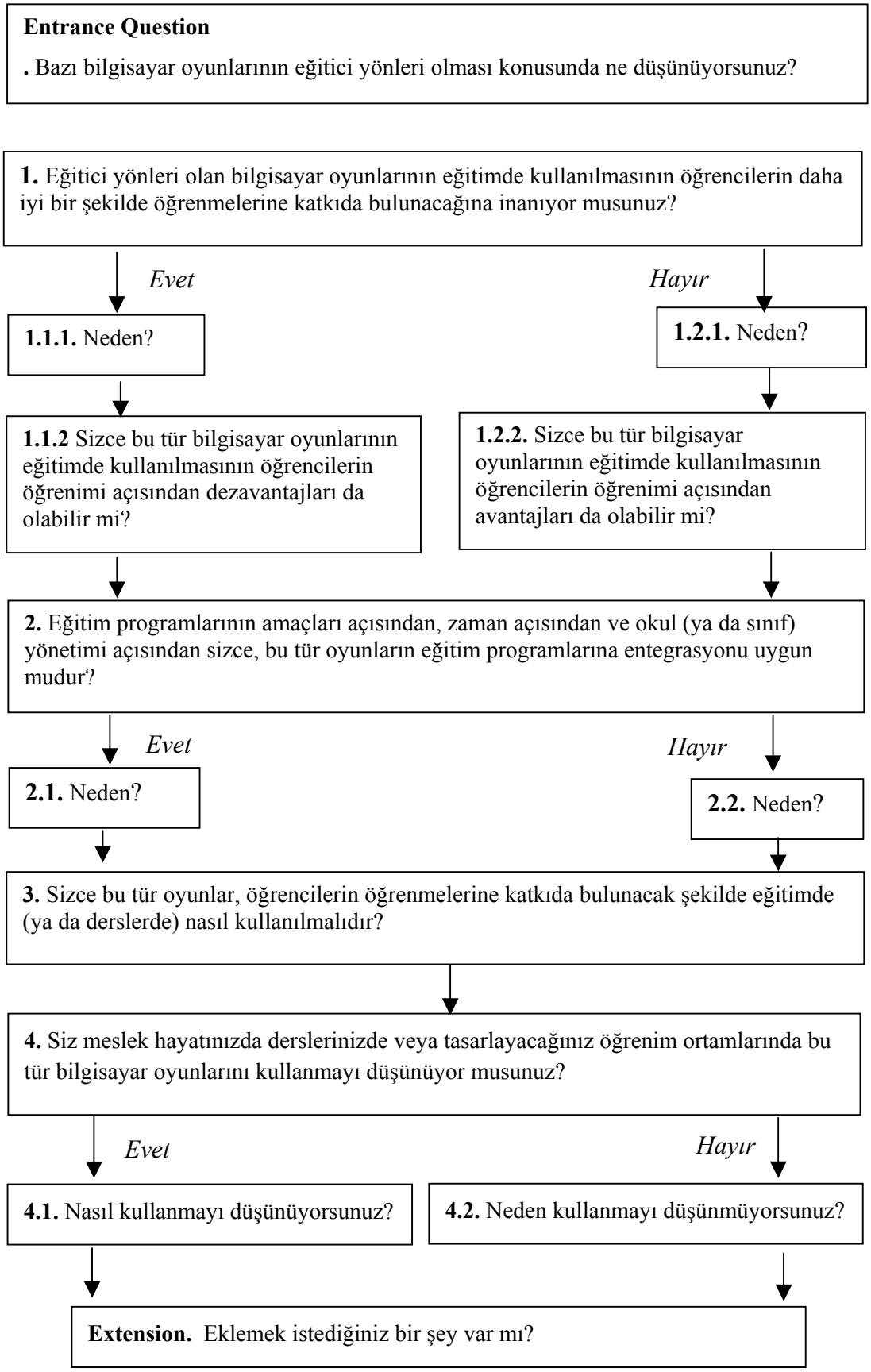
4.1. Evet> Nasıl kullanmayı düşünüyorsunuz?

4.2. Hayır> Neden kullanmayı düşünmüyorsunuz?

Extension question: Eklemek istediğiniz bir şey var mı?

Further Explanation Questions

- Açıklar mısınız?
- Biraz daha açar mısınız?
- Başka neler olabilir?


Entrance Question
. Bazı bilgisayar oyunlarının eğitici yönleri olması konusunda ne düşünüyorsunuz?
1. Eğitici yönleri olan bilgisayar oyunlarının eğitimde kullanılmasının öğrencilerin daha iyi bir şekilde öğrenmelerine katkıda bulunacağına inanıyor musunuz?
Evet
Hayır
1.1.1. Neden?
1.2.1. Neden?
1.1.2 Sizce bu tür bilgisayar oyunlarının eğitimde kullanılmasının öğrencilerin öğrenimi açısından dezavantajları da olabilir mi?
1.2.2. Sizce bu tür bilgisayar oyunlarının eğitimde kullanılmasının öğrencilerin öğrenimi açısından avantajları da olabilir mi?
2. Eğitim programlarının amaçları açısından, zaman açısından ve okul (ya da sınıf) yönetimi açısından sizce, bu tür oyunların eğitim programlarına entegrasyonu uygun mudur?
Evet
Hayır
2.1. Neden?
2.2. Neden?
3. Sizce bu tür oyunlar, öğrencilerin öğrenmelerine katkıda bulunacak şekilde eğitimde (ya da derslerde) nasıl kullanılmalıdır?
4. Siz meslek hayatınızda derslerinizde veya tasarlayacağınız öğrenim ortamlarında bu tür bilgisayar oyunlarını kullanmayı düşünüyor musunuz?
Evet
Hayır
4.1. Nasıl kullanmayı düşünüyorsunuz?
4.2. Neden kullanmayı düşünmüyorsunuz?
Extension. Eklemek istediğiniz bir şey var mı?

APPENDIX C

INFORMATION GIVEN DURING DATA COLLECTION

Anket Dağıtımından Önce

Merhaba. Adım Gülfidan Can. OrtaDoğu Teknik Üniversitesinde Yüksek Lisans tezim için bir araştırma yapıyorum. Tezimin amacı Bilgisayar ve Öğretim Teknolojileri Eğitimi bölümlerindeki bilgisayar öğretmeni adaylarının eğitici yönleri olan bilgisayar oyunlarının eğitimde kullanılmasına yönelik algılarını araştırmak. Bunun için sizden hazırladığım anketleri doldurmanızı rica edeceğim. Bu anketi eksiksiz doldurursanız çok sevinirim. Bir sorunuz olduğunda bana sorabilirsiniz. Cevaplarınız ve kimlik bilgileriniz kesinlikle gizli tutulacak ve sadece araştırma amaçlı kullanılacaktır.

Tez çalışmamın sonuçlarını öğrenmek için üst kısımdaki boşluğa e-posta adresinizi yazabilirsiniz. Sonuçlar adresinize gönderilecektir. Teşekkür ederim.

Anketlerin Toplanmasından Sonra

Aranızdan istekli 4 kişi ile fazla zamanınızı almayacak bir de görüşme yapmak istiyorum. İstekli 2 bayan ve 2 erkek arkadaşınız var mı?

Görüşmelerden Önce

Öncelikle görüşme yapmayı kabul ettiğiniz için teşekkür ederim. Görüşmeyi kaydetmemde bir sakınca var mı? Size beş soru yönelteceğim. İsterseniz içeriğinden biraz bahsedeyim. Öncelikle bilgisayar oyunlarının eğitici yönleri olup olmaması konusunda konuşacağız. Daha sonra oyunların eğitimde kullanılmasının avantajları ve dezavantajlarını, eğitimde kullanılmasının bazı açılardan uygun olup olmayacağını, sizin ileride bu tür oyunları kullanmayı düşünüp düşünmediğinizle ilgili sorular soracağım. Sormak istediğiniz bir şey var mı? İsminizi alabilir miyim?

APPENDIX D

TOP TEN GAME DESCRIPTIONS

AGE OF EMPIRES II

Age: Teen
Category: Strategy/RTS (Real Time Strategy)
Publisher: Microsoft

This game strongly exercises a person's intellect. It takes a great deal of planning and strategy to win this game, whether through conquest or other means (such as treaties). Not everyone will be your ally, so you must originate alternative plans as well. This game can be recommended for those that like a sturdy challenge. *Age of Empires II* gets an 87% (B)for its intellectually challenging matches, teaching of resource management, and all around fun.
(AL Menconi Ministries)

FIFA 2002 World Cup

Age: Everyone
Category: Sport
Publisher: Electronic Arts

More human realism and diversity in player faces, Improved facial animation, More joints in player skeletons, Supporting player audio in Out Of Play Scripts, Next Generation of Gameplay, Defenders mark better, especially in their own half, Goalies are now more challenging and play smarter, Volumes of new animation in kicks, sprints, shots, crosses, saves, etc., Smoother transition and blending between animations, Precise contact points in player-ball collision, Natural movement in turns and speed variance. Visually impacting, cinematic "In the game" experience.
(MegaGames)

HALF –LIFE & COUNTER STRIKE

Age: Mature
Category: -
Publisher: Sierra On-Line

The game is a tornado of violence and adrenal fast-paced action that absorbs the player into its fantasy world. Most well designed point-and-shoot games are capable of immersing you into their reality and *Half-Life* succeeds. When you are playing such a game, it is hard to acknowledge the world around you. The fantasy world makes you so powerful; it is more fun than the real world. A problem with this type of brutal and self-serving world is it's hard to withdraw yourself from it. *Half-life* gets a score of 55% (F+) due to the excessive blood and violence.
(AL Menconi Ministries)

Counter-Strike is the ultimate multiplayer gaming experience, combining all the elements of the Half-Life online universe with new single and multiplayer content. At the heart of this package is Counter-Strike, the number one played online action game built as an add-on for Half-Life
(MegaGames)

MEDAL OF HONOR

Age: Teen
Category: 3D shooter
Publisher: Electronic Arts

Medal of Honor: Allied Assault is a fairly realistic depiction of events that occurred in WWII, which gives teens and adults somewhat of an idea of the sacrifices that American soldiers gave in order that we might have the liberty, justice, and freedom that we have today. Even though the killings are justified in time of war, it still is very intense and not appropriate for children. Because of this *Medal of Honor: Allied Assault* gets a 68% (D+) for a large amount of violence.
(AL Menconi Ministries)

NEED FOR SPEED

Age: Everyone
Category: Racing
Publisher: Electronic Arts
The goal in Hot Pursuit mode is to avoid cops, road blocks, and spike belts. If you get pulled over for speeding, you get a warning on the first offense. The second offense sends you packing for jail time with Big Gay Al. (All Reviews)
With its enhanced 3-D sound and graphics, and improved cars and tracks (you can now drive as cops and at night), this version leaves all other driving games in the dust. You can play it

in a variety of modes, including Single Player, Multiplayer, Hot Pursuit, Knockout, and Tournament (Sam Mead).

RETURN TO CASTLE WONFENSTEIN

Age: Mature
Category: 3D – shooter action
Publisher: Activision

Return to Castle Wolfenstein is another one of those games with an overabundance of violence, and crude behavior. This game is well designed, has excellent graphics, sound, gameplay, etc. But because of the excessive blood and gore, and very blatant occult items and characters, Return to Castle Wolfenstein gets a 39 (F-)
(AL Menconi Ministries)

RED ALERT

Age: Teen
Category: Strategy
Publisher: Westwood Studios

Red Alert is a great game. There aren't an overwhelming number of mouse and keyboard commands to remember so you can jump in and get playing right away without a frustrating learning curve. This game is an interesting mental exercise in speculative history and war strategy. The violence is minimized while the strategy is the focus. The between level cinematics show the Soviet side led by Stalin as morally bankrupt and backstabbing. This is a fairly accurate portrayal of the truth. This is not a game for the very young, such as preteens, since it focuses on war and destruction. It earns a score of 77% (C) for young adults.
(AL Menconi Ministries)

SIMS

Age: Teen
Category: Domestic Strategy
Publisher: Maxis: A division of Electronic Arts

While *The Sims* does encourage more creativity than most games, it also appeals to the base nature of man. This game shows the player that it is difficult to run a happy household and it proves that if man were able to control his fellow man, this world would really be much worse off. This game teaches the player about life, but here are some concerns we have about what *The Sims* teaches. It is easy for this game to degenerate for many into a quest for materialism, hedonism, and debauchery. Like many games, the *Sims* is addictive in that it takes dozens or hundreds of hours to play well. This Trojan Horse packs a lot more deceit

than any other game I have played to date and earns a 50% (F) for Epicurean excess. (AL Menconi Ministries)

WARCRAFT

Age: Teen
Category: Strategy
Publisher: Blizzard Entertainment

"Warcraft" is a military strategy game that forces you to think about what you are doing instead of just slashing anything that moves. While playing, you have to decide whether to allocate gold and resources to building more structures and upgrading equipment or training more soldiers. Unfortunately, the positive aspects of the game are outweighed by the use of occult magic by both sides, the brutality of killing the defenseless peasants, and the occult imagery. "Warcraft" receives a 61% (D-) due to its occultic focus and preoccupation with slaughtering the other side.
(AL Menconi Ministries)

REFERENCES FOR GAMES

AL Menconi Ministries : http://www.almenconi.com/topics/games/reviews.html
Entertainment Software Rating Board: http://www.esrb.org/
Megagames: www.megagames.com
All Reviews : www.all-reviews.com

APPENDIX E

CITATIONS FOR PART II: QUESTIONS 20,21

Citations From the Responses of Part II: Question 21 for Students' Thoughts

[1] Ders böyle çok eğlenceli.

[2] Oyun oynamak çok güzel, keşke bütün derslerde oyun oynasak.

[3] Oh be, sıkılmıştım sade ders anlatımından. Çok şükür bizi anlayıp eğitici oyunlar getirdiler de eğlenerek oynuyoruz.

[4]Keşke kitaptan ders çalışsam.

[5] Keşke bütün derslerimiz böyle olsa. Canım bilgisayar öğretmenim benim.

[6] Bu öğretmen bize hiç bir şey öğretmiyor. Hep oyun oynatıyor.

[7] Bu oyunu çok sevdim.

[8] Hedefe ulaşmama az kaldı!

[9] İnşallah öğretmen derse başlamaz da oyuna devam edebiliriz.

[10] Sıkıcı oyun be! Eğitici yapcam diye sıkıcı bişi yapmışlar.

[11] Ya bunun yerine....oyununu açsak da oynasak olmaz mı?

[12] Oyunda uyguladığım bir çok hareketlerde ve sahnede öğretmenin anlattığı konular var.

[13] Amacımız ne?

[14] Hem oyun oynuyoruz, hem de öğreniyoruz.

[15] Dün öğretmenimin anlattıklarını şimdi daha iyi anlıyorum.

[16] x=y ise y=x'tir. Bize bunu sorduğuna göre cevap 3 olmalı.

[17] Bunu nasıl yapacağım?

[18] Öğretmenimin dediklerini yapıyorum ama bir şey anlamıyorum.

[19] Birinci ben olacam.!

[20] Öğretmenim bu turu nasıl geçeceğiz?

[21] Bak ne buldum.Şimdi, eğer bunu bu şekilde yaparsan... oluyor.

Citations From the Responses of Part II: Question 21 for Teachers' Thoughts

[22] Artık derse karşı daha çok ilgililer. Böyle devam etmeliyim.

[23] Dümdüz anlatıp geçseydim ya dersi.

[24] Acaba işe yarıyor mu?

[25] Zamanı yetiştirebilecek miyim acaba?

[26] Acaba öğretim amacıma doğru olan oyunu mu seçtim?

[27] Acaba seçtiğim oyun öğrencilerin seviyesine uygun mu?

[28] Daha içerikli oyunlar hazırlayarak öğrencilere destek olmalıyım.

[29] Öğrencilerin ilgisinin tamamen oyunlara yönelmesinden korkuyorum.

[30] Oyun oynatmadaki amacımı iyi bir şekilde ifade etmeliyim.

[31] Sınıfın gözetimi biraz zorlaşıyor. Disiplin zorlaşıyor.

[32] Sınıf yönetimi daha kolay oldu.

[33] Çok gürültü yapıyorsunuz. Sessiz olun.

[34] Oh be, hem gürültü patırtı olmuyor, hem de öğreniyorlar.

[35] Yine çok yoruldum.

[35] Dersi bu şekilde işlemek öğretim açısından bana kolaylık sağlıyor.

[37] Ders anlatmaktan kurtuldum.

[38] Zaman yönetimi zorlaşıyor.

[39] Oyunların eğitimde kullanılması zaman açısından daha verimli.

[40] Çocuklar bunu çok sevdi.

[41] Sıkıldıkları her hallerinden belli.

[42] Öğrenciler kolayca motive olduğu için baya rahatım.

[43] Derse karşı daha ilgililer.

[44] Kendilerini iyi kaptırıyorlar.

[45] Öğrenciler bu konuyu daha iyi anlayacaklar.

[46] Oyun oynatırken hem öğrenciler zevk alıyor, hem de bir şeyler öğrenebiliyor.

[47] Hem matematiklerini pekiştiriyorlar, hem bir belediyenin vermesi gereken hizmetleri öğreniyorlar. Gelir-gide hesabı yapmayı ve planlı davranmayı öğreniyorlar.

[48] Öğrendiklerini bu sayede pekiştirebiliyorlar.

[49] El becerisi, hızlı düşünme ve strateji bilgileri gelişiyor.

[50] Oyunda öğrendiklerini ders sonunda konuya bağlamalıyım ki amaç yerine gelsin.

[51] Bu yöntem çok saçma. Kimse dersle ilgilenmiyor.

[52] Öğrencilerin hepsi aktif bir şekilde derse katılıyor

[53] Öğrenciler kendileri yaparak, deneyerek bir şeyler öğreniyorlar.

[54] Böylece bana düşen görev daha azalıyor.
[55] Öğrenciye guidelık yapıyor. Çözümler, taktikler öneriyor.
[56] Neredeyse ben oynayacağım.

Citations From the Responses of Part II: Question 20 for Students Future Plans

[57] Öğrettiklerimi pekiştirici şekilde bir oyun kullanabilirim.
[58] Ödül olarak kullanabilirim.
[59] Öğretim amaçları doğrultusunda asıl öğretim materyali olarak kullanmayı düşünüyorum.
[60] Derslerin son 10 dakikasında oynatmak öğrencilerin öğrenmelerini olumlu etkileyecektir.
[61] Derslerin belli bir bölümünü bu oyun için ayırır ve öğrencilerle uygulama yapardım.
[62] Çok fazla sık olmamak kaydıyla kullanabilirim.
[63] Konuyla ilgili oyunlar bularak bunları öğrencilerin oynamasını sağlarım.
[64] Eğitici bilgisayar oyunlarını dersin hedefi kapsamında, içeriği yansıttığı ölçüde kullanabilirim.
[65] İlköğretim seviyesinde kullanılabilir.
[66] Çeşitli derslerin öğretiminde destek materyal olarak kullanabilirim.
[67] Daha etkili bir öğretim için mesleğimde bilgisayar oyunlarını kullanmayı düşünüyorum.
[68] Öğrencilerin zihinsel aktivitelerini artırmada (Probleme dayalı oyunlarda) kullanmayı düşünüyorum.
[69] Öğrencilerin bilişsel, duyuşsal gelişimleri açısından faydalı olacağını düşünüyorum.
[70] Bazı derslerin hedeflerini eğitici bilgisayar oyunları ile gerçekleştirebileceğime inanıyorum.
[71] Öğrencileri güdüleyecek, ilgilerini artıracak şekilde kullanmayı düşünüyorum.
[72] Dersin daha eğlenceli ve zevkli olarak işlenmesinde yardımcı olur.
[73] Görselliğin artması açısından kullanabilirim.
[74] Öğrencinin hayal dünyasını genişletmek amacıyla kullanılabilir.
[75] Mouse kullanımı, klavye kullanımı becerisini geliştirmede.
[76] Bilgisayar aşinalığı artırmak için.
[77] Eğitici yönleri olan bilgisayar oyunlarını öğrencilerimle birlikte yarışmacı ve işbirlikçi bir ortam sağlayarak kullanmayı düşünüyorum
[78] Bilgisayar oyunları yaratıcılığı kısıtlar.

[79] Bilgisayar oyunları öğretimde kullanılmamalıdır. Oyunun daha farklı amaçları vardır.
[80] Şu ana kadar eğitime katkı sağlayacak, yardımcı olacak hiç bir eğtici oyun görmedim.
[81] Öğretmenlik yapmayacağım.
[82] Eğitici de olsa bilgisayar oyunlarının yararından çok zararı vardır. Az bir yarar için çok zarara razı olma mantıka muhaldir.
[83] Öğrenci gözünde bilgisayar dersinin önemini ve etkisini azaltacağını düşünüyorum.
[84] Bununla ilgili bir çalışma yapmıştık. Ama derslerimde bunu kullanmam, çünkü istediğiniz amaçlar doğrultusundan yönlendirmek çok zor.
[85] Oyunlar bence sadece zevk almak için kullanılmalı.
[86] Kullanılması çok yararlı olur ama oyunları derslere başarılı bir şekilde entegre etmek uzmanlık işidir. Kendimi yeterli bulmuyorum.
[87] Çünkü bilgisayar oyunu ile uğraşacağım vakitte daha verimli şeyler yaptırabilirim.

APPENDIX F

INTERVIEW CITATIONS

[IE1]Daha önceden düşünmedim bu konularda ama aslında düşünmek gerek, nasıl entegre edilebilir diye kafa yorulabilecek şeyler.

[IE2]Bir bilgisayar öğretmeni adayı olarak almış olduğum bu fakülte bilgilerinden, almış olduğum dışarıdaki bilgilerden, karıştırmış olduğum kitaplardan, kaynaklardan tabi ki bunların eğitime yararlı olabileceği konusunda hem fikirim çoğu insanla.

[I1] Sadece bazı okullarda verilen matematik üzerine özel hazırlanmış oyunlar değil de bu gibi farklı FRP oyunları, ya da strateji oyunları, bunların faydalı olduğunu düşünüyorum, eğitici olduğunu düşünüyorum.

[I2] Eğitim programları içerisinde kullanılan oyunları eğer özellikle bilgisayar oyunu olarak düşünmezsek, bilgisayar oyunlarında pek eğitici yani özellikle yapılmış eğitici yönler olduğuna pek inanmıyorum. Eğitimde kullanılmasına da iyi gözle bakmıyorum açıkçası.

[I3] Maalesef ki piyasada bu eğitsel amaçlı bilgisayar oyunları yok.

[I4] Eğitim amaçlı olmayan oyunlar da var ve öğrenci psikolojisini ya da sosyal ilişkilerini olumsuz yönde etkileyebilecek oyunlar da var. Ama eğitim amaçlı kullanılan bilgisayar oyunlarının genel olarak çok olumsuz sonuçlar yaratacağını düşünmüyorum.

[I5] Özellikle rol yapma oyunlarını çok seviyorum. Birebir oradaki karakterle iletişim sağlıyorsunuz ve verdiğiniz kararlar doğrultusunda bir takım şeyler meydana geliyor. Bununda da sosyalleşme açısından etkili olduğunu düşünüyorum.

[I6] Bilgisayar oyunları bir nevi alışkanlık ve bağımlılık yaratabilir.

[I7] Genellikle gördüğüm bilgisayar oyunları daha ziyade şiddet içerikli, fakat tabi bilgisayar oyunu bir derya. Şiddet oyunlarının, biraz daha şiddete yönelik insanların gelişimini sağladığına inanıyorum.

[I8] Hemen hemen tüm derslere uygulanabilir diye düşünüyorum ben.

[I9] Öğrencilerin başka bir derste eksiklikleri varsa, bunu oyun oynayarak, onlara daha cazip bir şekilde, daha anlaşılır, daha onların isteyerek yapabileceği bir şekle dönüştürürsek diğer derslerdeki açıklarımızı gidereceğiz.

[I10] Bilgisayar dersi için hiç düşünmemiştim. Bilgisayar dersi için de mutlaka uygulanabilir.

[I11]Eğer doğru oyunlar seçilmişse, derse ilgi ve konsantre olduğu için ve ödül olarak sunulduğu zaman, daha az zaman kaybı olur. Konsantrasyon da daha yoğun olduğu için belki bir saatte öğrenilebilecek bir şey daha kısa zamanda algılanabilir. Zaman kaybedilmiyor, zaman kazanılabiliyor derslerde.

[I12] Bilgisayar oyunları çok fazla vakit alan şeyler. Koca bir saati ayırmak zorunda kalabilirsiniz. Müfredattan geri kalma şansın var. Sınıf yönetimi daha zor olabilir. Çocuklar çünkü "şöyle yaptım", ya da "ben yaptım" diye sınıfta çok fazla gürültü çıkarabilir. Sınıfı çok iyi manage etmek durumunda kalabilirsiniz.

[I13] Sınıf yönetiminde disiplini sağlamada daha kolaylık sağlıyor. İlgi tamamen karşıdaki monitöre olduğu için sınıf yönetimine oldukça yararlı. En azından öğretmene daha az iş kalıyor.

[I14] Eğer oyun çocuğu kesinlikle motive ediyorsa, çocukların çoğu oyuna adapte oldukları için gürültü olmaz, dağılmazlar. Oyundan çıkmak, kopmak bile istemezler.

[I15] Öğrenciye zevkli gelebilir ama ne öğrendiğinin farkında olmayabilir. Öğrenci oyun oynadığı zaman, "tamam, güzel bir oyun, çok da zevkli geçiyor ama öğretmen sınavda ne soracak, acaba ben ne öğrendim".

[I16] Eğer oyun öğrencinin ilgisini aşırı derecede çok çekerse, öğrenci dersi dinlemekten ziyade, öğretmene "oyun oynamak istiyorum" şeklinde istekte bulunabilir. Bu da dersin işleyişini engeller.

[I17] Dersi unutabilirler, oyuna dalabilirler. O an için artık derse geri dönmek de istemezler. Direk oyuna güdülenirler. Böyle şeyler de olabilir. Ama bu da öğretmenin elindedir.

[I18] Ne kadar idealist olursak olalım, bunu uygulamak çok zor. Mesela yeni mezunların hepsi "şunu yapacağım, bunu yapacağım" diye büyük bir hevesle gideriz ama duyduğum kadarıyla orada kesinlikle öyle olmuyormuş.

[I19] Okul yönetiminin istediği nedir. Öğrencinin kazanması gereken davranışlar yıl başında belirtilmiştir. Eğer öğrenci bu davranışları ve fazlasını kazanıyorsa, okul yönetimi açısından bence bir sorun olmaz. Şayet bu davranışlar eksik kalıyorsa bence o zaman sorun olur.

[I20] Tamamen okul yönetiminin kişisel özelliklerine kalmış. Yani, yeniliğe açık mı, bilgisayarı destekliyorlar mı. Eğer kendileri de bu oyunları biliyorlarsa, sürekli bilgisayar kullanan bir yönetimse, bunları desteklemeleri, bunları kurmaları hiç zor olmayacaktır.

[I21] Okullarda bilgisayar lablarının kullanımı çok sıkıntılı oluyor genelde. Öğrencilerin kişi başına düşen bilgisayar sayısı sınırlı vs. bu tip fiziksel sorunlar çıkıyor. Okulun yeterli laboratuarı, yeterli bilgisayarı var mı, yeterli oyunu var mı, her derse her konuya uygun oyunları var mı, bunlar biraz daha önemli.

[I22] Ben özellikle Türkiye'nin müfredatın çok kısıtlayıcı olduğunu düşünüyorum.

[I23] İlköğretim müfredatı çok yoğun değil. Aralara o tip oyunlar serpiştirilebilir. Diyelim ki fen bilgisinde bir konuyu işliyorlar. Ona dair bir oyun bulunabilirse o bilgisayar dersinde o gösterilebilir.

[I24] Öğrenme daha kısa sürede gerçekleşir. Çünkü isteyerek ve multimedia üzerinden. Göze, kulağa ve öğrencinin ilgisine hitap ettiği için öğrenim daha hızlı ve daha kalıcı oluyor.

[I25] Öğrencinin kendine bir şey katması, müfredatı da biraz genişletiyor. Yani, sadece sınıf ortamında klasik geçmişten kalma ders anlatımının haricinde biraz daha yapıcı bir şeyler ortaya çıkıyor.

[I26] Çocuklar yaparak, yaşayarak öğrendikleri zaman daha iyi öğreniyorlar. Oyunda da bir birey oluyorlar ve kendileri aktif olarak katıldıkları için bu tür oyunlar onların daha iyi öğrenmesini sağlıyor.

[I27] Biz bile eğlenerek öğrenmek istiyoruz. Bu amaçla eğitici oyunları kullanmak çok daha iyi.

[I28] Öğrenci bilişsel olarak öğrenmeyle kalmaz, onu yaşamış olur ve görmüş olur. Yani hayal etmesi, tahmin etmesi daha kolay olur diye düşünüyorum.

[I29] Devinişsel ve duyuşsal amaçlara katkısının kesinlikle olduğuna inanıyorum.

[I30] İlkokulda çocukların kimi el yeteneklerini geliştirmeleri gerekiyor. Bu tip şeyleri klavye ve mouse da sağlayabilir rahatlıkla. Bu tür gelişmeler için, çocukların psychomotor düzeydeki gelişmeleri için kullanılabilir. Daha ileriki yaşlarda, daha çok strateji ve düşünceye dayalı oyunlar seçilmeli bence, çünkü o yaşlarda bilişsel gibi gelişmeler sağlanmaya başlanır.

[I31]Bu oyunların kullanılması, motivasyonu ve istekliliği artırır diye düşünüyorum. Uzun süre yoğunluk sağlanabilir. Yani dikkatin biraz daha yoğun olması sağlanabilir.

[I32] Zihinsel aktivitelere ben çok önem veriyorum özellikle. Çünkü o yaştaki çocukların özellikle zihinsel gelişmelerinin oluştuğu bir dönem. Bu dönemde çocuklar düşünmeye, araştırmaya yöneltilebilir aynı zamanda. Ezberci gibi bir takım kalıplara sığmadan kullanılabilecek, çocukların bakış açısını değiştirebilecek, çok yönlü düşünmelerini sağlayabilecek bir yöntem olduğunu düşünüyorum.

[I33] Yararlı oyunlar sunulursa, bunların içerisine bence zekayı geliştiren tipler ve biraz da hayal gücünü geliştiren oyunlar giriyor. Bunlardan eğer oluşuyorsa bence yararlı.

[I34] Öğrenci hayal edemediği, kafasında canlandıramadığı şeyleri bilgisayar oyunları sayesinde öğrenebilir.

[I35] Öğrenme açısından belki sürekli oyun oynama diğer dersleri öğrenmelerine engel olabilir.

[I36] Ben şu anda piyasada olan oyunları, ya da yazılımlarda bulunan oyunlardan hiçbirini kullanmayı düşünmüyorum. Nedeni de, oyunların tamamen yaratıcılığı kısıtladığına inanıyorum. Dersin belli bir miktarında dersi anlattıysam, kalan kısmında öğrencilerin diğer işbirliği, devinişsel, bilişsel özelliklerini de kullanarak oyunları kendi yaratmaları taraftarıyım. Yani bilgisayarda da olsa, yani onu da kendileri oluşturmaları gerekir bence. Yani bir A ortamında, hazır o oyun sunulup da , “oyun yönergesi şudur, sonucu şöyle olur”, bütün öğrenciler bir yarış içerisinde. Bence gelişmeye çok ters bir şey.

[I37] Öğrenmeye yardımcı olarak kullanılmalı. Direk oyun üzerinden öğrenmeyle çok faydalı olacağını sanmıyorum.

[I38] Ders oyunla verilebilir. Zaten bu oyuna bağlı.

[I39] Bazen de ödül olarak kullanılabiliyor bilgisayar oyunları. O şekilde öğrenciler daha çok derse yöneliyorlar. "Ben bunu halledersem, bunu başarırsam, karşılığında bir ödül var".

[I40] Evlere, öğrencilere böyle bir oyun önerilebilir. Boş zamanlarını değerlendirme olarak da kullanılabilir.

[I41] Eğitim olarak bir grup çalışması içerisinde, bireysel oyunlar değil de daha çok grupça oynanabilen oyunlar olursa daha iyi olur.

[I42] Yarışmalar düzenlenebilir.

[I43] Cooperative ya da competitive bir yöntem kullanılarak öğrenciye belirli hedefler belirlemek gerek. Yalnız bu hedeflerin öğretmen tarafından belirlenmesi şart. Ve eğitim aracı olduğu takdirde öğretmenin kontrolü altında olması lazım.

[I44] Çocuklara da bırakılabilir bunlar (amaçlar). Ama zaten çocuklara bıraktığımız zaman da belli bir frame sağlıyoruz onlara. Bu yüzden çocuklara bırakılmasında bir sakınca yok. Hem daha çok motive olabileceklerini düşünüyorum kendileri seçerlerse.

[I45] Dersi anlatırsınız. Son on dakikada o dersin o bölümüyle ilgili oyunun o bölümünü çalıştırırsınız.

[I46] Çok fazla sık olmamak kaydıyla öğrenmeye katkıda bulunacağına ben inanıyorum. Yani öğrenciyi her zaman sanki oyun oynayacakmış gibi bağlamadan, ama arada bir uygun bulunduğu zamanlarda yapılırsa bence yararlı.

[I47] Eğer bizim amaçlarımıza uygun olmayan ama eğitici yönleri olan oyunlar kullanılırsa pek zaman kaybından başka bir şey olmayacaktır. Eğer bizim amaçlarımıza uyan, amaçlar doğrultusunda hizmet veren eğitici yönleri olan oyunlar oynanıyorsa, o zaman o oyun gerçekten işe yarar.

[I48] Dersin içeriğine uygun bir şekilde materyal hazırlanırsa, tamamen içindeki öğeler de öğretilen konuyu kapsıyorsa, o zaman oyunun eğitici yönü olabilir.

[I49] İlköğretim düzeyinde olması taraftarıyım. O düzeydeki eğitime oyunların entegre edilmesine taraftarım.

[I50] Oyunun çok iyi seçilmesi gerekiyor. Kesinlikle yanlış yerlere çekmemeli öğrenci bunu. İstenilen, düşünülen, orada planlanan amaca, hedefe varabilmeli öğretmen.

[I51] Zihinsel aktiviteleri artırırken kullanılması gerektiğini düşünüyorum.

[I52] Oyunun plan içerisinde çok iyi bir yerde konumlandırılması gerekiyor daha önceden düşünülmesi gerekiyor.

[I53] Okulun idaresiyle alakalı bir şey değil. Ders içinde öğretmen onu kendine göre yorumlayabildiyse, ya da bir oyunun belli bir bölümünü zaman açısından her şeyi göze alarak, öğrencilerin dikkatini de göze alarak derse uyarlayabildiyse, o zaman faydalıdır. Ama önemli olan onu yapabilmesi. Çünkü öğrenciler bir oyuna başlayınca onları tekrar derse döndürmek çok zor. Ben tamamen öğretmenin becerisine bağlıyorum aslında ve oyunun kalitesine.

[I54] Tek başına eğitici yönleri olan oyunların yeterli olabileceğine pek inanmıyorum çünkü muhakkak ki ikinci bir şahısa gerek var. Bu da öğretmen olacaktır. Çünkü öğrenciler oyunlarla belli noktalarda bir şeyler gerçekleştirebilecekler. Yani öğretmen en azından yardımcı olacaktır. En azından amacını belirtecektir. Öğrenci bunu tek başına başaramayabilir.

[I55] Dersi oyunlaştırabiliriz ama oyunu dersleştiremeyiz. Oyunun bir bölümünden yola çıkabiliriz, ya da dersi onun üzerinden gidebiliriz. Ama tamamen, "arkadaşlar bu oyundur oynayın" diyerek oyunun kesinlikle öğrencilere verilmemesi gerekir. Oyunun amacının belirtilmesi gerekir.

[I56] Eğitim yazılımının içine koyduğum bir oyun parçalı olabilir. Herhangi bir yerinde bırakıldığı takdirde öğrenciyi anti-motive edici bir şey olmaması lazım. Yani üç saatte ulaşılabilecek bir hedef, tek bir hedef olmaması lazım oyun içerisinde. Bir kaç tane hedef olmalı. Hoca bırak dediği zaman öğrenci de bırakabilmeli oyunu. O şekilde kısa süreli aşamalar halinde süren bir oyunu da kullanmayı düşünebilirim.

[I57] Şu an daha çok simülasyonların öğrenmeye katkısı olduğunu düşünüyorum. Bilgisayar oyunlarının pilot eğitimlerinde, çeşitli eğitimlerde kullanıldığını biliyorum. O şekilde olduğu zaman oldukça yararlı olduğunu düşünüyorum.

[I58] Bu tür oyunları kullanmayı düşünüyorum ama oyunun gerçekten iyi tasarlanmış olması gerekiyor ve benim amaçlarına uygun olması gerekiyor en başta.

[I59]Her ne kadar karşı da olsam, mutlaka uymak zorunda olduğumu biliyorum. O yüzden ben istemesem dahi bunu yenilemem gerektiğini biliyorum. Bu konuda kendimi geliştirmem de gerekiyor. Çünkü günümüzde çok büyük bir yer ediyor bilgisayar, hayatımızda çok büyük bir yeri var oyunların ve insanlar buna çok alışkın. Bunu da kullanmak zorundayız ki eğitim içerisinde de bulunsun. İnsanların alışık olmadıkları başka bir yönteme alıştırmak da uzun vakit alır. Olanı kullanmak da çok akıllıca. O yüzden kullanmaya çalışırım ama çok kontrollü bir şekilde.