DETERMINATION OF THE COMPUTER SELF-EFFICACY PERCEPTION OF STUDENTS AND METAPHORS RELATED TO "COMPUTER OWNERSHIP"

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ABSTRACT
The aim of this research is to determine the computer self-efficacy perception of second grade primary school students and their opinions regarding computer ownership through metaphors. The research applied the scanning model and was conducted during the 2011-2012 academic year among seven primary schools of the Ministry of National Education in the central district of Kocaeli City. Research data were collected using a survey study aimed at determining the self-efficacy perception of second grade primary school students (n=513); a metaphor method was used, through which they reflected upon their attitudes and opinions regarding computer ownership. In the metaphor, each student was asked to complete the statement, "owning a computer of my own is like..., because...". For the data analysis, the depictive analysis method was used, and the data obtained was presented in digitized form. The results showed that the self-efficacy perception of the second grade primary school students was quite strong and that the computer self-efficacy perception of the male students was higher than that of the female students. When the metaphors developed by the students were examined, it was observed that metaphors such as "owning a computer is like owning a car", "owning a computer is like owning a friend" and "owning a computer is like flying like a bird" were stated more often than other metaphors.
Keywords: primary school secondary level students, computer self-efficacy perception, computer ownership

1. INTRODUCTION

Although modern information technologies enable the rapid growth of information, they have also changed the means of achieving it. Information that was obtained from educational environments or libraries in the past can today reach individuals in any environment and at any time in a very rapid and up-to-date manner. Today, information tags the societies as a priceless treasure. Because information technologies are expanding rapidly and effecting social life, education systems need to produce individuals who are able to adapt themselves to the information era. As the result of these developments, societies' expectations of education systems have also changed. To meet these expectations, many educational systems have adopted approaches that provide students with the skills necessary to obtain information, rather than simply transferring current information to them. As stated by Glasser (1993), the individual of the 21st century must have an information productive nature, rather than simply storing the information. For individuals to adapt themselves to the aforementioned developments, it is essential for them to closely monitor current information and technologies, and effectively use them in their lives. Computers, which play a vital role in the widespread development of information technologies, contribute through many technological evolutions. For example, given the widespread use of computers in all fields, anything that comes to mind can be transmitted to an electronic environment. Given the extension of the e-citizen concept to concepts such as e-trade, e-business and e-education, citizens are inevitably required to become computer and Internet literate at a basic level. For the students to be able to use computers effectively in their lives, they should be offered relevant opportunities at an early age. Cakmak (2001) emphasizes the convenience of providing computer education in the first grade of primary school. Combining the use of computer technologies in educational environments and the provision of the educational content with traditional education in an electronic environment using multiple learning materials can increase the number of applications that activate the students, thereby facilitating the achievement of information and promoting efficiency and productivity in education. The importance of computers in social life is undeniable; students that are knowledgeable about computers will use them efficiently in their daily lives and future business lives, thereby facilitating their adaptation to modern life. For students to gain knowledge, skills and attitude regarding computer technologies, they must be able to achieve within these environments as well as believe in their capabilities. Belief and trust in one's capacity to do something is termed self-efficacy. The concept of self-efficacy has been used primarily by Bandura (1997). Bandura (1997) stated that self-efficacy has three main dimensions: behavioral, environmental and individual. Because self-efficacy is defined as an individual's belief in their capacity to fulfill a task, computer self-efficacy may be defined as "an individual's belief in his/her capacity toward using a computer" (Koseoglu et al., 2007). In studies, it was observed that trust regarding computer self-efficacy was a significant variable regarding computer use (Askar and Umay 2001; Işiksal and Askar 2003). It was observed that individuals with high self-efficacy were more eager to engage in computer-related activities and had higher expectations regarding the results of these activities (Koseoglu et al., 2007). As mentioned previously, acquiring basic computer skills at an early age is a necessity today. Attending computer classes provided to primary-level students is the main factor effecting students' computer self-efficacy. Evaluation of students' self-efficacy perception levels before and after taking computer classes in primary

school and analyzing the factors that affect these levels is very important to understanding the steps that need to be taken regarding the subject. In addition, determination of primary school students' computer self-efficacy perceptions is also important in terms of determining the efficiency of the computer classes provided in schools. When the results of the study regarding computer self-efficacy perception were analyzed, it was observed that most of these studies focused on the prospective teachers (Akkoyunlu and Kurbanoglu, 2003; Akkoyunlu and Orhan, 2003; Askar and Umay, 2001; Baki et al., 2008; Gurcan, 2005; Kellenberger, 1996; Ozden et al., 2007). However, few studies focused on secondary class students (Ekici and Uzun, 2008; Işiksal and Askar, 2003). Determination of the computer self-efficacy perceptions of second grade primary school students may contribute to their self-adaptation, particularly given the current environment in technology-intensive societies, thereby leading these students to develop positive attitudes and take the measures that are necessary to achieve self-confidence. Applications that facilitate the use of computer technologies, such as the use of interactive boards and tablet PCs (the FATİH project) have been initiated for use in primary and secondary grade classes. Studies conducted in this field may aid in determining the computer self-efficacy perceptions of second grade primary school students and the organization of computer classes and computer-supported classes within second grade primary school programs and in higher educational institutions.

Among such studies, Işiksal and Askar's (2003) paper entitled "Mathematics and Computer Self-Efficacy Measures for the Primary School Students" aimed to develop self-efficacy perception measures in mathematics and computer use for use in measuring the mathematics and computer self-efficacy perceptions of 7th and 8th grade students in primary school. In their study, Işiksal and Askar observed that the male students had a significant average, whereas female students had a higher average in terms of computer self-efficacy. Uzun et al. (2010) attempted to evaluate second grade primary school students' computer self-efficacy perceptions by measuring their computer utilization frequencies. The results showed that the self-efficacy perception scores of 6th and 7th grade students increased significantly with frequency of computer use. However, the students' pre-test and post-test results did not significantly differ in terms of gender, age or income levels.

It was observed that students who received computer classes beginning in primary school and continuing through high school and university developed computer self-efficacy perceptions in a positive manner (Askar and Umay, 2001). Based on this viewpoint, recognition of students' computer self-efficacy levels both at home and in educational environments would contribute toward taking more concrete steps that enabling these students to adapt to such environments and gain the necessary knowledge, skills and self-confidence to achieve success. Having considered the significance of this subject, the Kocaeli Metropolitan Municipality has initiated a project that aims to endow students with high computer literacy in the future. This project is detailed below.

Kocaeli Metropolitan Municipality's "A Computer for Each Student" Project

In Turkey, the number of primary school students per computer is 30.9% (DPT, 2011). The corresponding figure for 2010 in Kocaeli is 33.9% (Information Society Statistics, 2011). In 2009, with the aim of educating individuals with high computer literacy levels, Kocaeli Metropolitan Municipality initiated a campaign to distribute mini-laptops (notebook computers) free of charge to second grade students attending official primary schools in the city of Kocaeli. This program provided students with computers, which are critical tools that enable them to adapt to modern times, discover their talents, develop their creativity and undertake research. The project aims to distribute 130.000 laptops in 5 years and is in its 3rd year (the 2011-2012 academic year). By the 3rd year of this project (the 2011-2012 academic year) and with the motto "The aim is to render each student literate", 80.828 computers were distributed to second grade primary school students. Today, computers are among the most widely used electronic devices after the television. Many children are born in houses where computers and other electronic devices already exist. Undoubtedly, computers existed in many houses prior to the Kocaeli Metropolitan Municipality project, and many primary school students had already encountered computers in their homes and schools or in Internet cafes. However, because of this project, children from medium and low socioeconomic -level families also own computers. In other words, computers existed previously in the houses of high and medium socioeconomical -level families, and these computers were used communally or individually. These computers are located either in the children's room or in other parts of the house. However, within the scope of the Kocaeli Municipality project, each student was given a computer of his/her own.

According to studies, computer ownership has a positive effect on the self-efficacy levels of individuals (Karsten and Roth, 1998, Hakverdi et al., 2007; Torkzadeh and Koufterous, 1994, Houle, 1996). Determination of the computer self-efficacy perceptions of primary school students is considered beneficial toward identifying students with low perception levels and reinforcing their perceptions regarding the subject. Important questions include, "what are the computer self-efficacy levels of students who already own a computer"? and "What do students who have a computer think about "computer ownership"? These types of questions needed to be asked

to persuade students to present their feelings and opinions regarding computer ownership and examine their self-efficacy levels.

In this study, students' opinions regarding "computer ownership" were revealed through metaphors. A metaphor (mental image, figurative expression) is defined as "a statement used in a sense other than its original meaning as a result of a particular relation or simile" by the Turkish Language Agency (TLA, 2011). In education, metaphors can be used to visualize abstract concepts and describe them in a more concrete manner (Singh, 2010). In education, metaphors have been used for professional thinking, professional identity development and as pedagogical tools and tools for reflection, evaluation and research; metaphors have also been used as program theories, mental models, discovery models and as tools for changes in education (Saban, 2006). Metaphors are strong modeling and mental mapping mechanisms that can aid individuals in understanding and constructing their own worlds (Tatar and Murat, 2011). Strenski (1989) states that the metaphors are effective in reflecting and shaping our opinions and hence, determining our behaviors (Arslan and Bayrakci, 2006). Individuals develop attitudes within the framework of the perceptions they form and make choices through their behaviors in this direction. Therefore, the determination of perceptions is of great significance (Coklar et al., 2010). Different data collection methods can be used in determining, revealing and interpreting perceptions. One of the methods used is collecting data using metaphors. From this viewpoint, it is important to determine the perceptions of students toward "computer ownership". The relationship between the current insights of students and their attitudes toward computers may be examined. In this study, metaphor was used as a research tool. The students were asked to state their opinions regarding computer ownership in a figurative way.

1.1. Aim of the Research

The aim of this research is to determine the computer self-efficacy levels of second grade primary school students and the metaphors developed by them toward "computer ownership" and to evaluate them in terms of certain variables (gender, education level, years of computer and Internet utilization, choice of future profession, etc.). For these reasons, the following questions were asked:

1. What are the computer self-efficacy perception levels of second grade primary school students?
2. Do computer self-efficacy perception levels depend on gender, class level, the social-economical conditions of the environment in which the school is located, whether the students will choose a computer-related profession in the future, the frequency of mini-computers use at home, the number of computers available and the person using the mini-computer?
3. What are the metaphors used by students regarding "computer ownership"?
4. Under which conceptual categories can the metaphors obtained be classified?

2.METHOD

2.1. Research Model

To determine the computer self-efficacy perceptions of second grade primary school students, the scanning model was adopted. In this research, the mixed method was used, within the scope of which qualitative and quantitative data were collected and analyzed together. The mixed method examines a specific phenomenon by rendering the qualitative and quantitative data to be used collectively (Gay, Mills & Airasian, 2009). For this purpose, both the computer self-efficacy perceptions of the students and their opinions regarding computer ownership were determined.

2.2. Universe and Sampling

The universe of the research conducted within the scope of the scanning model comprised second grade primary school students in 6 th, 7 th and 8th class in 61 schools within the central district of Kocaeli. The sample comprised central district students who were selected using "proportional cluster sampling". In the proportional cluster sampling process, the universe is primarily categorized into subuniverses sharing similar features. The chance for each subuniverse to be included within the sample is equal to its proportion within the whole. A proportional cluster sampling established in this way is considered to form a more representative sample (Karasar, 2007). Based on the proportional cluster sampling data obtained from the İzmit Directorate of National Education, the aforementioned universe is divided into three subuniverses depending on the "social-economical level" variable as "high (9 primary schools)", "medium (26 primary schools)" and "low (26 primary schools)". Then, seven primary schools that reflected the percentage of the related subuniverse (10%) within the whole were selected from each universe. Thus, 3 schools were included from the low socioeconomic level, 3 from the medium socioeconomic level and 3 from the high socioeconomic level within the scope of the research. A total of 524 students were included in the research. However, some students had not included their demographic information in the survey, and therefore, only 513 students were evaluated.

2.3. Data Collection Tool

Research data were collected using the "Computer Self-Efficacy Perception Scale" and the metaphors formed regarding computer ownership. The first part of the data collection tool comprised questions regarding gender, class level, socioeconomic level, whether the students will choose a computer-related profession in the future, the duration of computer use, the frequency of mini-computer use, the number of computers at home and by whom the mini-computers are being used. In the second part, to determine the students' computer self-efficacy perceptions, the "Computer Self Efficacy Perception Scale" developed by Işıksal and Askar (2003) with regard to second grade primary school students was used, with the permission of the authors. Items composing the scale were combined into two factors relating to general information regarding computers and specialized computer skills. The computer self-efficacy perception scale comprises 10 items. The scale was prepared as a 5-item Likert type. The items were graded from "I totally agree-5" to "I totally disagree-1". Accordingly, the minimum and maximum total grades are 10 and 50, respectively. The reliability of the scale was calculated as α =.86.

The students' opinions regarding "computer ownership" were obtained through metaphors. The students were asked to complete the statement, "having a computer of my own is like..., because...". After the application of the computer self-efficacy perception survey, the students were given sheets of paper on which the statement "having a computer of my own is like..., because..." was written. Then, the metaphor was explained to the students. The students were asked several times to compare "computer ownership" to something else that they possess and to state the reasons for their choice. The students were given approximately 20 minutes to form the metaphors. As the first metaphor that came to the students' minds was sought, the aforementioned time interval was deemed sufficient. The relationship between the subject and the source of the metaphor was determined by the phrase "is like", and the students were asked to complete the sentence with the word "because". The conjunction "because" was used to bring forth the meaning attributed to the metaphor and the reason behind its having been chosen.

2.4. Data Analysis

Data collected using the computer self-efficacy perception scale was analyzed using the 15.0 program in a computer environment. The data were analyzed using averaging, standard deviations, the independence t-test, one-way analysis of variance and LSD tests. The significance level was chosen as 0.05. To determine the intervals of the arithmetic overalls, 5-column, 4-interval logic was used. This interval value is 4/5=0.8. Accordingly, the values were interpreted as 11.00-1.79: never / 1.80-2.59: occasionally / 2.60-3.39: sometimes / 3.40-4.19: mostly and 4.220-5.00: always.

The students were asked to write down a metaphor indicating their feelings toward owning a computer. However, 13 of the students did not state any metaphors regarding computer ownership. The analysis and interpretation of the metaphors stated by the remaining 500 students were realized within the framework of the following stages: (1) Denotation, (2) Sorting (elimination and refinement), (3) re-organization and composition, (4) category development and (5) transferring the data to a computer for quantitative data analysis (Saban et al., 2005:541).

1. Denotation: Metaphors produced by the students were identified as concepts (e.g., ambulance, encyclopedia, automobile, friend, hose, etc.). The sentences containing metaphors written by the students were entered into the Excel program together with the user information. Then, the metaphors were listed in a separate column and arranged alphabetically.
2. Sorting (elimination and refinement): At this stage, using the "metaphor analysis" (Moser, 2000) and "content analysis" (Yıldırım and Simsek, 1999) techniques, each metaphor was divided into parts and analyzed in terms of their similarities and differences to other metaphors. Hence, the metaphors produced by the students were examined and refined based on the following four criteria: (a) papers with only explanations and no metaphors, (b) papers including certain metaphors but without an explanation of motive (logical explanation), (c) metaphors comprising features related to more than one category and (d) "illogical" metaphors or metaphors that did not contribute toward an improved understanding of the concept of "computer ownership" (Saban et al., 2005:541). Based on these criteria, 34 out of 500 forms were eliminated because the metaphors used did not contribute to a better understanding of the computer ownership concept. Twenty-four forms were also eliminated because no explanation was provided. For these reasons, 47 forms were excluded from the research. As a result, 442 forms were evaluated and used in the interpretation. After these procedures, the metaphors were relisted alphabetically and reviewed. Personal information about the person who produced each metaphor was coded in parentheses immediately following each metaphor. The meanings of these codes are as follows: (1) "L" refers to schools located in neighborhoods with low socioeconomic levels, "M" refers to schools located in neighborhoods with socioeconomic medium levels and "H" refers to schools located in neighborhoods with high socioeconomic levels. (2) The numbers 6, 7 and 8 in parentheses represent the student class grades (6=sixth grade, 7=seventh

grade and 8=eighth grade). (3) The letters "B" and "G" in parentheses represent the gender of the students (B=boy student, G=girl student). Finally, to distinguish between participants having the same socioeconomic levels, class levels and genders, a number was written immediately following the letter identifying the gender, for certain metaphors.

3. Re-organization and Composition: After invalid metaphors were eliminated, 112 metaphors were obtained. A list comprising valid metaphors was then formed.

4. Category Development: At this stage, metaphors produced by the students were examined in terms of the features they shared with computer ownership. A sample metaphor statement was selected from each student expression to represent each metaphor category. Hence, from 112 metaphors, a "sample metaphor list" was formed prepared by compiling the images that were considered to ideally represent each metaphor ideally. During this procedure, on the basis of the "sample metaphor list" formed from 112 metaphors, we examined how each metaphor image conceptualized the computer ownership phenomenon. To achieve this aim, each metaphor produced by the students was analyzed in terms of (1) the subject of the metaphor, (2) source of the metaphor and (3) the relationship between the subject and the source of the metaphor. Then, each metaphor image was associated with a specific theme in terms of its perspective regarding computer ownership, and 11 separate conceptual categories were formed.

To ensure reliability within the research and verify whether the metaphor images categorized under 11 conceptual headings achieved represented the aforementioned conceptual categories, we referred to an expert for their opinion. To this end, two lists prepared by the researchers were submitted to an academician: (a) a list comprising 112 sample metaphors arranged alphabetically and (b) a list comprising the names and features of 11 conceptual categories. The academician was asked to match the sample metaphor images in the first list to the conceptual categories in the second list (without excluding any metaphor image). Then, the correspondence decided by the academician was compared to the correspondence decided by the researcher. The number of agreed and disagreed points was determined, and the reliability of the results was calculated using the Miles and Huberman formula (Reliability = Agreement / [Agreement+Disagreement]*100). When the reliability is greater than 0.70, the result is considered reliable (Miles and Huberman, 1994). The compatibility between the evaluations of the academician and the researcher was α =0.93, thus indicating that the desired reliability was obtained. The academician assigned six metaphors (having a boss, saying "everything belongs to me", a world of my own, having a baby, having a water resource, owning a jewelry store) as belonging to different categories than those assigned by the researcher. At this point, the reliability was calculated as 112 / 106 + 6 = 0.94.

5. Transferring the Data to the SPSS Program Package for Quantitative Data Analysis: After the determination of a total of 11 metaphors and the development of the dominant group composed of these metaphors, all of the data were transferred to the SPSS statistics program. Following this procedure, the number of students (f) representing each metaphor and category, and their percentages (%) were calculated on the basis of class levels.

4. FINDINGS AND INTERPRETATION

In this chapter, the data are analyzed and interpreted regarding the objective and subobjectives of the research and supported with the relevant research results.

The Demographic Features of the Studied Students

The demographic features of the students who participated in the research are presented in Table 1.

Table 1: The demographic features of the students who participated in the research.

Demographic Features		
Gender	**Number**	**%**
Girl	281	54.8
Boy	232	45.2
Class	**Number**	**%**
6	195	38.0
7	181	35.3
8	137	26.7
Socioeconomic levels of the environments where the schools are located	**Number**	**%**
Low	238	46.4
Medium	194	37.8
High	81	15.8
Whether the student preferred a computer-related profession in the future	**Number**	**%**
Yes I would	187	36.5
No I would not	326	63.5
General use of the mini-computers	**Number**	**%**

Drawing	61	11.9
Writing	170	33.1
Playing games	266	48.1
Using course CDs	209	40.7
Playing games on the Internet	191	37.2
Researching on the Internet	352	68.6
Facebook	330	64.3
Listening to music	266	51.9
How long the students have been using computers	**Number**	**%**
Less than 1 year	71	13.8
1-2 years	84	16.4
3-4 years	132	25.7
5 years or more	226	44.1
Frequency of computer usage	**Number**	**%**
Everyday	178	34.7
3-4 times a week	186	36.3
Once a week	120	23.4
Several times a month	29	5.7
Number of computers at home	**Number**	**%**
1	134	26.1
2-3	314	61.2
4 or more	65	12.7
Lessons for which the mini-computer is used	**Number**	**%**
Science	12	2.3
Mathematics	27	5.3
English	393	76.6
Social Sciences	81	15.8

It is observed that more than half of the students participating in the research are female (54.8, Table 1). In terms of class levels, 38.0% of the students are in the sixth grade, 35.3% are in the seventh grade and 26.7% are in the eighth grade. Regarding the schools, 46.4% are located in areas with a low socioeconomic level, 37.8% are located in areas with a medium socioeconomic level and 15.8% are located in areas with a high socioeconomic level. The students were asked whether they would prefer a computer-related profession in the future. Although 36.5% of the students stated that they would choose such a profession, 63.5% stated that they would rather choose a profession that is not related to computers. When the students were asked for which purposes they used the mini-computers, 68.6% stated that they used them for research on the Internet, 64.3% used them for Facebook applications, 51.9% used them to listen to music, 48.1% used them to play games and 40.7% used them with course CDs. More than half of the students used computers for research on the Internet and Facebook applications. Whereas approximately half (44.1%) of the students had been using computers for five years or more, 13.8% had been using computers for less than a year. The percentage of students using the computers every day was 34.7%. The percentage of students using the computers several times a month is 5.7%, and 61.2% of the students had 2-3 computers in their homes. The percentage of students with 4 or more computers in their homes was 12.7%. When the students were asked which of their school lessons they used computers for, most replied that they used their computers for English lessons (76.6%) and that they logged in the Ministry of National Education program "Dyned" on the Internet with their teachers. This is a foreign language program comprising a computer-based education process. The students stated that they used the mini-computers for only science, mathematics and social sciences and that they mostly surfed the net with their teachers during class.

1. What are the computer self-efficacy perception levels of the second grade primary school students?
To determine the computer self-efficacy levels of the students, explanatory statistics regarding the items on the self-efficacy scale were calculated, and the findings obtained are presented in Table 2.

Table 2: Explanatory statistics regarding the items on the computer self-efficacy scale.

Items	$\bar{X}$	**Ss**
1. I can surf along the computer programs and discover new things	4.03	1.05
2. I can reach the information I need by using the computer.	4.56	0.76
3. I can save the information to the right place in the computer.	4.70	0.65
4. I can enter data by using computer programs (Word, Excel, PowerPoint etc.)	4.49	0.97
5. I can write any script I want by using computer programs (Word, Excel, PowerPoint	4.67	0.77

etc.)		
6. I can sort data by using computer programs (Word, Excel, Powerpoint etc.)	4.40	0.96
7. I can make arithmetical operations by using computer programs (Word, Excel, Powerpoint etc.)	4.25	1.09
8. I can draw graphics by using computer programs (Word, Excel, Powerpoint etc.)	4.30	1.09
9. In case I encounter a problem related to the computer, I can solve it.	3.96	1.07
10. I can easily learn a new computer program.	4.33	0.94
Total	43.73	6.06

Based on Table 1, the students display computer self-efficacy "most of the time" or "all the time". The students are able to do eight of ten items at all times ["I can save the information to the right place in the computer" ($\bar{X}$=4.70), "I can write any script I want by using computer programs (Word, Excel, Powerpoint etc.)" ($\bar{X}$=4.67), "I can reach the information I need by using computer programs" ($\bar{X}$=4.56), "I can enter data by using computer programs (Word, Excel, Powerpoint etc.)" ($\bar{X}$=4.49), "I can sort data by using computer programs (Word, Excel, Powerpoint etc.) ($\bar{X}$=4.40), "I can easily learn a new computer program"($\bar{X}$= 4.33), "I can draw graphics by using computer programs (Word, Excel, PowerPoint etc.)" ($\bar{X}$=4.30), I can make arithmetical operations by using computer programs (Word, Excel, PowerPoint etc.)" ($\bar{X}$=4.25)]. When the items are considered as a whole, an average score of $\bar{X}$= 43.73 out of 50 shows that the computer self-efficacy levels of the second grade primary school students are quite high.

2. Do the computer self-efficacy perceptions of second grade primary school students show a significance difference according to gender, class level, the socioeconomic level of the environment where the school is located, whether they would prefer to choose a computer-related profession in the future, the length of time that they have been using computers, the frequency of their mini-computer use or the number of computers at home?

Findings related to the computer self-efficacy perceptions of the second grade primary school students according to gender, class level, the socioeconomic level of the environment where the school is located, whether they would prefer to choose a computer-related profession in the future, the length of time that they have been using computers, the frequency of their mini-computer use or the number of computers at home, and by whom the computers are being used are mentioned below.

Table 3: The computer self-efficacy perceptions of students according to various variables.

Computer self-efficacy perceptions		**N**	$\bar{X}$	**ss**	**t**	**p**
Gender	Girl	281	43.23	6.46	2.076	.038
	Boy	232	44.34	5.50		
Computer self-efficacy perceptions		**N**	$\bar{X}$	**ss**	**F**	**p**
Class levels	6	195	43.46	6.12	0.748	.474
	7	181	44.17	5.23		
	8	137	43.54	6.94		
Computer self-efficacy perceptions		**N**	$\bar{X}$	**ss**	**F**	**p**
The socioeconomic level of the environment in which the schools are located	Low	238	42.88	6.73	7.947	.000
	Medium	194	43.86	5.52		
	High	81	45.93	4.47		
Computer self-efficacy perceptions		**N**	$\bar{X}$	**ss**	**t**	**p**
Whether they would choose a computer-related profession in the future	Yes, I would	187	44.39	6.06	1.87	.062
	No, I would not	326	43.35	6.04		
Computer self-efficacy perceptions		**N**	$\bar{X}$	**ss**	**F**	**p**
For how long they have been using computers	Less than 1 year	71	41.59	6.73	11.078	.000
	1-2 years	84	41.85	7.05		
	3-4 years	132	43.47	6.01		
	5 years or longer	226	45.25	5.00		
Computer self-efficacy perceptions		**N**	$\bar{X}$	**ss**	**F**	**p**
Frequency of using the mini	Every day	178	44.73	5.28		

computers	3-4 times a week	186	43.48	5.72	3.811	.010
	Once a week	120	43.27	6.55		
	A couple of times a month	29	41.10	9.06		
Computer self-efficacy perceptions		**N**	$\bar{X}$	**ss**	**F**	**p**
Number of computers at home	1	134	42.08	6.69		
	2-3	314	44.14	5.79	7.584	.001
	4 or more	65	45.13	5.29		

To determine whether the students' computer self-efficacy perceptions differed according to gender, a t-test was conducted, and a significant difference between the male and female students' statistical computer self-efficacy perception grades was found [t(513)=2.076; p<.05]. The computer self-efficacy perception grade averages of the female students ($\bar{X}$=43.23) were lower than those of the male students ($\bar{X}$=44.34).

To determine whether the computer self-efficacy perceptions of the students differed according to class level, one-way variance analysis and LSD tests were conducted. No significance difference was observed between the computer self-efficacy perception grade averages of 6 th, 7 th and 8th class students [F(513)=0.748; p>.05]. This finding shows that the computer self-efficacy perceptions of the students do not depend on their class level.
As the result of the analysis conducted to determine whether the computer self-efficacy perceptions of the students differ with regards to the socioeconomic levels of the environments where the schools are located, a significant difference was observed between the socioeconomic levels and computer self-efficacy perception grade averages [F(513)=7.947; p<.001]. The computer self-efficacy perception grade average ($\bar{X}$=45.93) of the students in the high socioeconomic level category is higher than those in the medium and low categories.

An independent t-test was conducted to determine whether the computer self-efficacy perceptions of the students differed depending on the probability of choosing a computer-related profession in the future. No significant difference was found between the profession they would choose in the future and their computer self-efficacy perception grade averages was found [t(513)=1.87; p>.05]. To determine whether the computer self-efficacy perceptions of the students depended on how long they had been using computers, one-way variance analysis and LSD tests were conducted. A significant difference was observed between the computer self-efficacy perception grade averages of the students that depended on how long they had been using computers [F(513)=11.078; p<.001]. The computer self-efficacy perception grade averages of the students who had been using computers for more than five years ($\bar{X}$=45.25) were higher than those who had been using computers for 3-4 years ($\bar{X}$=43.47), 1-2 years ($\bar{X}$=41.85) or less than one year ($\bar{X}$=4159).

To determine whether the computer self-efficacy perceptions of the students differed depending on the frequency computer use, one-way variance analysis and LSD tests were conducted. A significant difference was observed between the computer self-efficacy perception grade averages of the students that depended on the frequency of computer use [F(513)=3.811; p<.01]; the computer self-efficacy perception grade average of the students who used the computer every day was the highest ($\bar{X}$=44.73). This category was followed by those using their computers 3-4 times a week ($\bar{X}$= 43.48), once a week ($\bar{X}$=43.27) or a couple of times a month ($\bar{X}$=41.10), respectively. To determine whether the computer self-efficacy perceptions of the students differed depending on the number of computers at home, one-way variance analysis and LSD tests were conducted, and a significant difference was observed [F(513)=7.584; p<.001]. Students with 4 or more computers at home appeared to have higher computer self-efficacy perceptions ($\bar{X}$ =42.08) than those with 2-3 computers ($\bar{X}$=44.14) or one computer ($\bar{X}$=42.08) at their homes.

3. What metaphors are stated by the students that are related to "computer ownership"?
Table 4 lists the metaphors developed by the students arranged in alphabetical order, including the number of students representing each metaphor and their percentages.

Table 4: The metaphors developed by the students that are related to computer ownership, and the number of students representing these metaphors and their percentages (in alphabetical order).

		Number of students representing the metaphor				Number of students representing the metaphor	
Metaphor Code	Metaphor Name	f	%	Metaphor Code	Metaphor Name	f	%
1	Owning a horse	2	0.45	57	Most loyal friend	7	1.58
2	Shopping	2	0.45	58	Fun box	6	1.35
3	Ambulance	2	0.45	59	Being as smart as Einstein	6	1.35
4	Owning an encyclopedia	4	0.90	60	Bringing electricity to a house without electricity	2	0.45
5	Owning a car	47	11	61	A child with sugar coated apple	3	0.67
6	Having a friend	38	8.52	62	Games played at home	3	0.67
7	Playing with friends	4	0.90	63	Playing my favorite game	5	1.13
8	Owning fish	1	0.22	64	A window opening to fun	4	0.90
9	Owning a secret bank account	1	0.22	65	Studying with a best friend	4	0.90
10	Owning a cell phone	9	2.03	66	Being a slave	3	0.67
11	Feeling like a scientist	4	0.90	67	Owning a beautiful painting	6	1.35
12	Owning a parrot	4	0.90	68	Owning a secret place	8	2
13	Owning a diary	4	0.90	69	Using clothes	4	0.90
14	Owning a toy	10	2.26	70	Easily achieving all information	4	0.90
15	Owning a dog	6	1.34	71	A bus going everywhere	4	0.90
16	Owning a servant	9	2.03	72	Our friends being with us all the time	6	1.35
17	An information source	3	0.67	73	Being able to say “everything is mine”	5	1.13
18	An information house	2	0.45	74	A mother who only cares about me and never gets tired	3	0.67
19	A wise person	2	0.45	75	Being at school and at a party at the same time	6	1.35
20	A boat in the middle of the sea	1	0.22	76	Owning an Internet cafe	5	1.13
21	Telling a secret to the wall	1	0.22	77	Taking something you want	4	0.90
22	An apple worm	1	0.22	78	A world of my own	12	2.71
23	Owning a pet	17	4	79	Finding something you want in a huge book	6	1.35
24	Owning a house	11	2.48	80	Having a bad feeling	2	0.45
25	Having a sibling	4	0.90	81	Being a king or a queen	3	0.67
26	Owning a cat	1	0.22	82	A pencil	11	2.48
27	Owning a book	5	1.13	83	Owning a jewelry store	11	2.48
28	Owning a library	4	0.90	84	Owning a slave	5	1.13
29	Owning a room	8	2	85	Having a bad habit	5	1.13
	Being a businessman						

30		2	0.45	86	Flying like a bird	28	6.33
31	A guest coming to the house	5	1.13	87	An immortal flower	6	1.35
32	Feeling like a sultan	4	0.90	88	Having a teacher	5	1.13
33	Having a boss	1	0.22	89	Feeling like someone special	7	1.58
34	Owning a secret box	3	0.67	90	Being free	23	5.20
35	Having a nanny	4	0.90	91	Looking out of the window	3	0.67
36	Having a baby	2	0.45	92	Relaxing drugs	6	1.35
37	Feeling like an adult	15	3.39	93	A comfortable arm-chair	3	0.67
38	Hiding somewhere	4	0.90	94	Continuously walking alone	4	0.90
39	Trusting someone	3	0.67	95	Owning a chair	6	1.35
40	A water source	3	0.67	96	Passing the placement test	17	4
41	Staring absently	3	0.67	97	Having a lover	10	2.26
42	Owning an ignorant person	2	0.45	98	Owning a magical sphere	6	1.35
43	Being hardworking	3	0.67	99	Increase of our problems	4	0.90
44	Babysitting	7	1.58	100	Owning a super smart robot	10	2.26
45	Having a very wise friend	3	0.67	101	A continuously flowing river	5	1.13
46	Having a knowledgeable friend	3	0.67	102	Traveling at sea on your own	4	0.90
47	A very good feeling	18	4.07	103	Walking outside on your own	4	0.90
48	Eating chocolate	5	1.13	104	Ruling technology	3	0.67
49	Owning a classroom	3	0.67	105	Owning a TV	3	0.67
50	Owning a toothbrush	10	2.26	106	Buying a plane	5	1.13
51	Doing what he/she wants	3	0.67	107	Making the distances near	6	1.35
52	Eating ice-cream	2	0.45	108	A supplementary source	21	4.75
53	Taking a walk in nature	5	1.13	109	Having a life coach	7	1.58
54	Owning nature	3	0.67	110	Having an adult	8	2
55	Traveling alone at sea	3	0.67	111	Walking on a never-ending road	10	2.26
56	Going on a world trip	8	2	112	Eating, drinking something	5	1.13

The students developed a total of 112 valid metaphors regarding the topic "Owning a computer of my own is like..., because..." (Table 4). Overall, the most popular metaphors developed by the students were "owning a car" (n=47, 11%), "having a friend" (n=25, 8.52%) and "flying like a bird (n=28, 6.33%)". Sixth grade students developed 70 metaphors, 7th grade students developed 69 metaphors and 8th grade students developed 43 metaphors. To classify these metaphors, 11 conceptual categories were developed. These were: identifying with a reference guide (n=16, 14.28%), a good feeling and a friend (n=17, 15%), a precious object (n=11, 9.82%), a place-traveling (n=20, 17.85%), a power icon (n=12, 10,71%), a vehicle (n=7, 6.25%), human-specific features (n=5, 4.46%), a business (n=5, 4.46%), animals (n=7, 6.25%), private (n=6, 5.35%) and negative feelings (n=6, 5.35%). Metaphorical images commonly depicted by the students were as follows: (1) owning a car (11%), (2) having a friend (8.52%), (3) flying like a bird (6.33%), (4) being free (5.20%), (5) a supplementary source (4.75%), (6) having a pet (4%), (7) feeling like an adult (3.39%), (8) a world of my own (2.71%), (9) owning a toothbrush (2.26%) and (10) a super smart robot (2.26%). In this chapter, we first introduce 11 conceptual categories that were developed regarding *computer ownership*. Then, these conceptual categories were compared in terms of class level.

Conceptual Categories

1. *References Guide*

Table 5: Metaphors identifying "Computer Ownership" with a "References Guide"

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Owning an encyclopedia	-	2 (0.45)	2 (0.45)	4 (0.90)
2	An information source	2 (0.45)	1 (0.22)	-	3 (0.67)
3	An information storehouse	-	2 (0.45)	-	2 (0.45)
4	A wise person	-	2 (0.45)	-	2 (0.45)
5	Owning a book	3 (0.67)	1 (0.22)	1 (0.22)	5 (1.13)
6	Owning a library	2 (0.45)	2 (0.45)	-	4 (0.90)
7	Feeling like a scientist	1 (0.22)	-	3 (0.67)	4 (0.90)
8	Having a knowledgeable friend	1 (0.22)	2 (0.45)	-	3 (0.67)
9	Having a very wise friend	1 (0.22)	2 (0.45)	-	3 (0.67)
10	Owning a classroom	3 (0.67)	-	-	3 (0.67)
11	Finding something you want in a huge book	2 (0.45)	3 (0.67)	1 (0.22)	6 (1.35)
12	Having a teacher	3 (0.67)	2 (0.45)	-	5 (1.13)
13	A supplementary source	3 (0.67)	2 (0.45)	16 (3.61)	21 (4.75)
14	Having a life coach	-	2 (0.45)	5 (1.13)	7 (1.58)
15	Having an adult	3 (0.67)	2 (0.45)	3 (0.67)	8 (1.80)
16	Easily achieving all information	3 (0.67)	1 (0.22)	-	4 (0.90)
	Total				
	Student	27 (6.10)	26 (5.88)	31 (7.01)	84 (19)
	Metaphor	12 (10.71)	14 (12.5)	7 (6.25)	16 (14.28)

This category represents 84 students (19%) and 16 metaphors (14.28%) in total (see Table 4). Five dominant metaphors within the aforementioned category are stated as follows: (1) a supplementary source (4.75%), (2) having an adult (1.80%), (3) having a life coach (1.58%), (4) finding something you want in a huge book (1.35%), (5) owning a book (1.13%), and having a teacher (1.13%), respectively. The metaphors "owning a book", "finding something you want in a huge book", "a supplementary source" and "having an adult" were commonly stated by all the participants. The main characteristics of this category are as follows:

1. Computer ownership was identified with owning a reference guide (***an encyclopedia, a supplementary source, a library).***

"Owning a computer is like owning ***an encyclopedia*** *because I can find anything I want anytime, just like I can with* ***an encyclopedia.****"* (L/7/G)

"*Owning a computer is like owning* ***a supplementary source*** *because owing to computer, I can learn any information related to my lessons on the Internet"* (H/8/G)

"Owning a computer is like owning ***a library*** *because it contains much information. We can obtain the information we need by a computer."* (H/6/G)

2. Computer ownership was identified with having a wise person in one's life ***(a wise person, having a teacher, having a life coach).***

"Owning a computer is like having ***a wise person in one's life*** *because he/she can tell me anything when I ask"* (H/7/B1)

"Owning a computer is like having ***a teacher*** *because it teaches me my lessons just like my teacher"* (L/6/G)

"Owning a computer is like having ***a life coach*** *because I can refer to it regarding everything in my life"* (H/7/B2).

2. *A good feeling and a friend*

Table 6: Metaphors identifying "Computer Ownership" with a "a Good Feeling" and "a Friend"

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Having a friend	4 (0.90)	-	-	4 (0.90)
2	Having a toy	6 (1.35)	2 (0.45)	2 (0.45)	10 (2.26)
3	A guest coming to our house	3 (0.67)	2 (0.45)	-	5 (1.13)
4	A very good feeling	11 (2.48)	6 (1.35)	1 (0.22)	18 (4.07)
5	Eating chocolate	-	2 (0.45)	3 (0.67)	5 (1.13)
6	Doing whatever I want	3 (0.67)	-	-	3 (0.67)

7	Eating ice cream	1 (0.22)	1 (0.22)	-	2 (0.45)
8	A child with a sugar-coated apple	-	2 (0.45)	1 (0.22)	3 (0.67)
9	Playing my favorite game	-	2 (0.45)	3 (0.67)	5 (1.13)
10	Games played at home	1 (0.22)	2 (0.45)	-	3 (0.67)
11	A fun box	4 (0.90)	1 (0.22)	1 (0.22)	6 (1.35)
12	A window which opens to fun	3 (0.67)	1 (0.22)	-	4 (0.90)
13	Owning a beautiful painting	-	5 (1.13)	1 (0.22)	6 (1.35)
14	Flying like a bird	12 (2.71)	10 (2.26)	6 (1.35)	28 (6.33)
15	Passing the placement test	1 (0.22)	5 (1.13)	11 (2.48)	17 (3.84)
16	Relaxing drugs	-	1 (0.22)	5 (1.13)	6 (1.35)
	Total				
	Student	49 (11.08)	42 (9.50)	34 (7.69)	125 (28.28)
	Metaphor	11 (9.82)	14 (12.5)	10 (8.92)	16 (14.28)

According to Table 6, the number of students representing the metaphor "computer ownership is like having a good feeling and a friend" is 125 (28,28%), and 16 metaphors (4.28%) were developed. Dominant metaphors in this category are: (1) flying like a bird (6.33%), (2) a very good feeling (4.07%), (3) owning a toy (2.26%), (4) relaxing drugs (1.35%), a fun box (1.35%), owning a beautiful painting (1.35%), (5) a guest coming to our house (1.13%), eating chocolate (1.13%), and playing my favorite game (1.13%), respectively. The metaphors "owning a toy, a very good feeling, a fun box, flying like a bird and passing the placement test" were commonly stated by all the participants. The main characteristics of this category are as follows:

1.Owning a computer was identified with playing a game (***playing with friends, owning a toy and games played at home***).

"Owning a computer is like ***playing with friends*** *because it is as much fun to spend time with it"* (H/6/B)

"Owning a computer is like ***having a toy*** *because I can turn on the computer and play as many games as I want"* (H/6/G)

"Owning a computer is like ***the games played at home*** *because we can play hundreds of games in the computer at our homes"* (M/6/G)

2. Owning a computer was identified with eating something sweet (***eating chocolate, eating ice-cream, a child with a sugar-coated apple***).

"Owning a computer is like ***eating chocolate*** *because spending time with the computer gives as much pleasure as eating chocolate and makes me relaxed "* (L/7/G1)

"Owning a computer is like ***eating ice cream*** *because when you eat ice-cream you always enjoy it, and when you spend time with the computer, you enjoy yourself just like eating ice-cream and become happy"* (L/7/G2)

"Owning a computer is like ***a child with a sugar-coated apple*** *because a child with a sugar-coated apple is happy, and owning a computer makes a person happy just like the sugar-coated apple"* (L/8/G)

3. Owning a computer was identified with having a good feeling (***a very good feeling, passing the placement test, flying like a bird***)

"Owning a computer is like ***having a very good feeling*** *because this feeling is always there and may only be experienced, but cannot be explained"* (L/7/G)

"Owning a computer is like ***passing the placement test*** *because you experience the happiness you feel when you pass an important exam also when you own a computer"* (L/6/G)

"Owning a computer is like ***flying like a bird*** *because you can happily and freely go anywhere you like, just like a bird"* (M/7/G).

3. *A precious object*

Table 7: Metaphors developed as "a precious object"

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Having a friend	19 (4.29)	4 (0.90)	15 (3.39)	38 (8.59)
2	The most loyal friend	4 (0.90)	1 (0.22)	2 (0.45)	7 (1.58)
3	Having a sibling	3 (0.67)	1 (0.22)	-	4 (0.90)
4	Having a baby	1 (0.22)	1 (0.22)	-	2 (0.45)
5	A water source	1 (0.22)	2 (0.45)	-	3 (0.67)
6	Studying with my best friend	1 (0.22)	-	3 (0.67)	4 (0.90)
7	Our friends being with us at all times	-	1 (0.22)	5 (1.13)	6 (1.35)
8	Owning a jewelry store	8 (1.80)	2 (0.45)	1 (0.22)	11 (2.48)
9	An immortal flower	1 (0.22)	5 (1.13)	-	6 (1.35)

10	Having a lover	1 (0.22)	1 (0.22)	8 (1.80)	10 (2.26)
11	Being free	7 (1.58)	6 (1.35)	10 (2.26)	23 (5.20)
	Total				
	Student	46 (10.40)	24 (5.42)	44 (9.95)	114 (25.79)
	Metaphor	10 (8.92)	10 (8.92)	4 (3.57)	11 (9.82)

This category represents 114 students (25.79%) and 11 metaphors (9.82%) (Table 7). Five dominant metaphors stated in this category are as follows: (1) having a friend (8.59%), (2) being free (5.20%), (3) owning a jewelry store (2.48%), (4) having a lover (2.26%), and (5) the most loyal friend (1.58%), respectively. The statements commonly used by all the participants are; "having a friend", "most loyal friend", "owning a jewelry store", "having a lover" and "being free". The main characteristics of this category are as follows:

1. Owning a computer was identified with having someone the student cares about (***having a friend, having a sibling, having a baby***).

"Owning a computer is like ***having a friend*** *because I share everything and every moment with my computer"* (L/8/B)

"Owning a computer is like ***having a sibling*** *because it does everything I want, makes me laugh and sometimes makes me angry"* (L/6/B**1**)

"Owning a computer is like ***having a baby*** *because it belongs to only you, you can do whatever you want but you must take care of it, look after it and protect it"* (L/6/B**2**)

2. The students assimilated "computer ownership" to owning a materially or morally precious object (***a water source, owning a jewelry store, an immortal flower and being free***)

"Owning a computer is like ***having a water source*** *because when considered in terms of knowledge, a computer gives us extensive information just like a water source quenching our thirst, and knowledge is a never ending richness just like a water source"* (L/7/B1)

"Owning a computer is like ***owning a jewelry store*** *because information is even more precious than gold. With concrete knowledge, you can possess all the gold in the world"* (L/7/B2)

"Owning a computer is like ***an immortal flower*** *because owning a computer is like a flower which will always please you and will never decrease in value or liveliness"* (H/7/B1)

"Owning a computer is like ***being free*** *because we can do anything and anytime we want on our computer, no one can intervene"* (M/6/G1).

4. *A particular place-traveling*

Table 8: Metaphors identified with a particular place and traveling

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	A boat in the middle of the sea	-	1 (0.22)	-	1 (0.22)
2	Owning a house	6 (1.35)	5 (1.13)	-	11 (2.48)
3	Owning a room	4 (0.90)	4 (0.90)	-	8 (1.80)
4	Hiding somewhere	2 (0.45)	2 (0.45)	-	4 (0.90)
5	Walking in nature	4 (0.90)	1 (0.22)	-	5 (1.13)
6	Going on a world trip	-	3 (0.67)	5 (1.13)	8 (1.80)
7	Traveling at sea	-	1 (0.22)	2 (0.45)	3 (0.67)
8	Bringing electricity to a house without electricity	1 (0.22)	1 (0.22)	-	2 (0.45)
9	Having a secret place	-	2 (0.45)	6 (1.35)	8 (1.80)
10	Owning an Internet cafe	2 (0.45)	-	1 (0.22)	3 (0.67)
11	A world of my own	5 (1.13)	1 (0.22)	6 (1.35)	12 (2.71)
12	Being at school and at a party at the same time	-	1 (0.22)	5 (1.13)	6 (1.35)
13	Looking out of the window	1 (0.22)	2 (0.45)	-	3 (0.67)
14	A comfortable arm-chair	1 (0.22)	-	2 (0.45)	3 (0.67)
15	Owning a chair	1 (0.22)	-	5 (1.13)	6 (1.35)
16	A continuously flowing river	-	3 (0.67)	2 (0.45)	5 (1.13)
17	Sea voyaging on my own	-	1 (0.22)	3 (0.67)	4 (0.90)
18	Walking outside alone	1 (0.22)	-	3 (0.67)	4 (0.90)
19	Walking on a never-ending road	-	2 (0.45)	8 (1.80)	10 (2.26)
20	Making distant places near	-	3 (0.67)	3 (0.67)	6 (1.35)
	Total				
	Student	28 (6.33)	33 (7.46)	51 (11.53)	112 (25.33)
	Metaphor	9 (9.82)	11 (9.82)	6 (5.35)	20 (17.85)

One hundred and twelve students developed 20 metaphors developed as a particular place or space (Table 8). The dominant metaphors dominant in this category are as follows: (1) a world of my own (2.71%), (2) owning a house (2.48%), (3) walking on a never-ending road (2.26%), (4) owning a room (1.80%), going on a world trip (1.80%), having a secret place (1.80%), (5) being at school and at a party at the same time (1.35%), owning a chair (1.35%) and making distant places near (1.35%), respectively. The metaphor identifying "computer ownership" to "having a world of one's own" was commonly stated by all the participants. The main characteristics of the metaphors comprising this category are as follows

1. Owning a computer was identified with owning a particular place (***owning a house, owning a room, owning a secret place***).

*"Owning a computer is like **owning a house** because it belongs to me and I can do anything I want without asking permission, just like walking around in a house"* (H/7/G1)

*"Owning a computer is like **owning a room** because I can use it however I want, and no one can see the private belongings in your room"* (L/7/B1)

*"Owning a computer is like **having a secret place** because when you need to hide somewhere and in similar situations you don't need to ask permission or speak to anyone, and this secret place is my private computer"* (L/7/G1)

2. Owning a computer was identified with traveling (***going on a world trip, traveling at sea, walking on a never-ending road***).

*"Owning a computer is like **going on a world trip** because you have the opportunity to see anywhere you like"* (M/7/G1)

*"Owning a computer is like **traveling in the sea** because we can compare the knowledge we obtain from the computer to an endless sea and travel in the sea of knowledge"* (L/7/B2)

*"Owning a computer is like **walking on an endless road** because once you own it, you become fascinated with the flow of life in the computer and address it at all times, just like a never-ending road through which you continuously walk"* (M/7/B).

5. *A power icon*

Table 9: Metaphors identified with a "power icon"

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Having a secret bank account	-	1 (0.22)	-	1 (0.22)
2	Being a businessman	1 (0.22)	1 (0.22)	-	2 (0.45)
3	Feeling like a sultan	-	3 (0.67)	1 (0.22)	4 (0.90)
4	Owning nature	1 (0.22)	2 (0.45)	-	3 (0.67)
5	Taking whatever I want	2 (0.45)	2 (0.45)	-	4 (0.90)
6	Being a king or a queen	1 (0.22)	2 (0.45)	-	3 (0.67)
7	Owning a slave	1 (0.22)	4 (0.90)	-	5 (1.13)
8	Feeling like someone special	4 (0.90)	1 (0.22)	2 (0.45)	7 (1.58)
9	Owning a magical sphere	3 (0.67)	-	3 (0.67)	6 (1.35)
10	Owning super smart robot	1 (0.22)	3 (0.67)	6 (1.35)	10 (2.26)
11	Ruling technology	-	1 (0.22)	2 (0.45)	3 (0.67)
	Total				
	Student	14 (3.16)	20 (4.52)	14 (3.16)	48 (10.85)
	Metaphor	8 (7.14)	10 (8.92)	5 (4.46)	11 (9.82)

This category represents 48 students (10.85%) and 11 metaphors (9.82%) (Table 9). Five dominant metaphors in this category are as follows: (1) owning a super smart robot (2.26%), (2) feeling like someone special (1.58%), (3) owning a magical sphere (1.35%), (4) owning a slave (1.13%), (5) feeling like a sultan (0.90%) and taking everything I want (0.90%), respectively. The metaphors of "feeling like someone special" and "owning a super smart robot" were commonly stated by all the participants. The main characteristics of this metaphor category are as follows:

1. Computer ownership was identified with being a powerful person (***owning a secret bank account, being a businessman, feeling like a sultan).***

*"Owning a computer is like **having a secret account in a bank** because no one can intervene in our private lives"* (L/7/G1)

*"Owning a computer is like **being a businessman** because it requires managing and planning many things"* (M/6/B1)

*"Owning a computer is like **feeling like a sultan** because it does everything I want"* (L/7/B).

6. *A Vehicle*

Table 10: Metaphors identified with a "vehicle"

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Ambulance	-	-	2 (0.45)	2 (0.45)
2	Owning a car	21 (4.75)	22 (4.97)	4 (0.90)	47 (10.63)
3	Owning a cell phone	2 (0.45)	2 (0.45)	5 (1.13)	9 (2.03)
4	Bus	-	1 (0.22)	3 (0.67)	4 (0.90)
5	Owning a TV	-	2 (0.45)	1 (0.22)	3 (0.67)
6	Buying a plane	-	2 (0.45)	3 (0.67)	5 (1.13)
	Total				
	Student	23 (5.20)	29 (6.56)	18 (4.07)	70 (15.83)
	Metaphor	2 (1.78)	5 (4.46)	6 (5.35)	6 (5.35)

Regarding the "vehicle" category, 70 students stated 6 metaphors (Table 10). Three dominant metaphors in this category are (1) owning a car (10.63%), (2) owning a cell phone (2.03%) and (3) buying a plane (1.13%), respectively. Metaphors commonly stated by all the participants are "owning a car" and "owning a cell phone". The main characteristics of the metaphors within this category are as follows:

1. Computer ownership was identified with owning a vehicle ***(owning a car, owning a cell phone, owning a TV)***

*"Owning a computer is like **owning a car** because I can go anywhere I want"* (L/7/G1)

*"Owning a computer is like **owning a cell phone** because I can communicate with everybody, as if they are right beside me"* (L/8/G1)

*"Owning a computer is like **owning a TV** because I can easily watch anything I want"* (H/8/G1).

7. *Human-specific characteristics*

Table 11: Metaphors identified with human-specific characteristics

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Being as smart as Einstein	1 (0.22)	2 (0.45)	3 (0.67)	6 (1.35)
2	Feeling like an adult	5 (1.13)	9 (2.03)	1 (0.22)	15 (3.39)
3	Trusting someone	2 (0.45)	1 (0.22)	-	3 (0.67)
4	Being hard-working	-	1 (0.22)	2 (0.45)	3 (0.67)
5	Being able to say "I own everything"	1 (0.22)	1 (0.22)	3 (0.67)	5 (1.13)
	Total				
	Student	9 (2.03)	14 (3.16)	9 (2.03)	32 (7.23)
	Metaphor	4 (3.57)	5 (4.46)	4 (3.57)	5 (4.46)

Regarding human-specific characteristics, 32 students developed 5 metaphors (Table 11). The most popular metaphor developed by the students was "feeling like an adult (3.39%)". This metaphor was followed by "being as smart as Einstein" (1.35%) and "being able to say 'I own everything' " (1.13%). The main characteristics of the metaphors within this category are as follows:

1. Computer ownership was identified with human-specific characteristics ***(being as smart as Einstein, feeling like an adult)***

*"Owning a computer is like **being as smart as Einstein** because owing to computer, I can be acquainted with everything, I can make researches, do my homework and become a hard-working person"* (L/7/B)

*"Owning a computer is like **feeling like an adult** because I can turn on the computer anytime I want and do my homework or satisfy my needs without consulting anyone"* (L/7/G).

8. *Business*

Table 12: Metaphors identified with "business"

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Shopping	2 (0.45)	-	-	2 (0.45)
2	Having a servant	3 (0.67)	2 (0.45)	4 (0.90)	9 (2.03)

3	Having a boss	1 (0.22)	-	-	1 (0.22)
4	Babysitting	2 (0.45)	5 (1.13)	-	7 (1.58)
5	Eating or drinking something	-	4 (0.90)	1 (0.22)	5 (1.13)
	Total				
	Student	8 (1.80)	11 (2.48)	5 (1.13)	24 (5.42)
	Metaphor	4 (3.57)	3 (2.67)	2 (1.78)	5 (4.46)

Five metaphors are identified with "business" by 24 students (Table 12). The dominant metaphors in the category are as follows: (1) having a servant (2.03%), (2) babysitting (1.58%), (3) eating or drinking something (1.13%), (4) shopping (0.45%) and (5) having a boss (0.22%), respectively. The main characteristics of the metaphors within this category are as follows:

1. Computer ownership was identified with an activity ***(shopping, having a boss)***

"Owning a computer is like ***shopping*** *because people do shopping extensively and buy everything they see on the Internet"* (L/6/G)

"Owning a computer is like ***having a boss*** *because after a while, the computer starts to rule over you, you do not want to leave it and it becomes your boss"* (L/6/B).

9. *An animal*

Table 13: Metaphors identified with identifying with an animal

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Owning a horse	-	2 (0.45)	-	2 (0.45)
2	Owning fish	-	1 (0.22)	-	1 (0.22)
3	Owning a parrot	3 (0.67)	1 (0.22)	-	4 (0.90)
4	Owning a dog	4 (0.90)	2 (0.45)	-	6 (1.35)
5	An apple worm	1 (0.22)	-	-	1 (0.22)
6	Owning a pet	6 (1.35)	2 (0.45)	9 (2.03)	17 (3.84)
7	Owning a cat	1 (0.22)	-	-	1 (0.22)
	Total				
	Student	15 (3.39)	8 (1.80)	9 (2.03)	32 (7.23)
	Metaphor	5 (4.46)	5 (4.46)	1 (0.89)	7 (6.25)

In the category in which computer ownership was identified with owning an animal, 32 students developed 7 metaphors (Table 13). The dominant 3 metaphors are: (1) owning a pet (3.84%), (2) owning a dog (1.35%) and (3) owning a parrot (0.90%), respectively. The main characteristics of the metaphors within this category are as follows:

1. Owning a computer was identified with owning an animal (***owning a dog, an apple worm, owning a cat***)

"Owning a computer is like ***owning a dog*** *because dog is loyal and so is the computer. It does whatever you want. The dog eats, and laptops need energy"* (H/7/B)

"Owning a computer is like ***an apple worm*** *because just like the apple, there are beauties in the computer but one must know the right time to turn it off"* (L/6/G)

"Owning a computer is like ***owning a cat*** *because we love the cats, and we love the computers. We play games with the cats, just as we do with the computers"* (L/6/B).

10. *Private*

Table 14: Metaphors developed privately by the students

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Owning a diary	-	-	4 (0.90)	4 (0.90)
2	Telling a secret to the wall	-	-	1 (0.22)	1 (0.22)
3	Owning a secret box	-	1 (0.22)	2 (0.45)	3 (0.67)
4	Owning a toothbrush	6 (1.35)	2 (0.45)	2 (0.45)	10 (2.26)
5	Owning a pencil	1 (0.22)	2 (0.45)	8 (1.80)	11 (2.48)
6	A mother who cares only about me and never gets tired	2 (0.45)	1 (0.22)	-	3 (0.67)
7	Walking alone continuously	-	-	2 (0.45)	2 (0.45)
8	Using clothes	2 (0.45)	2 (0.45)	-	4 (0.90)
	Total				

	Student	9 (2.03)	6 (1.35)	19 (4.29)	34 (7.69)
	Metaphor	3 (2.67)	4 (3.57)	6 (5.35)	6 (5.35)

In the "private" category, 34 students developed 8 metaphors (Table 14). The three dominant metaphors are as follows: (1) owning a pencil (2.48%), (2) owning a toothbrush (2.26%), and (3) owning a diary (0.90%) and using a cloth (0.90), respectively. The main characteristics of the metaphors within this category are as follows:
1. Owning a computer was identified with owning a private item (***owning a toothbrush, a diary, a secret box***)
*"Owning a computer is like **owning a toothbrush** because toothbrush belongs to only me and no one can use it. Just like my toothbrush, I am the only person who can use my computer"* (L/6/G)
*"Owning a computer is like **owning a diary** because just like the diary, everything is hidden in my computer, it can be our repository when we want, we can write all our secrets and daily experiences in the computer and hide them there"* (M/8/G)
*"Owning a computer is like **owning a secret box** because a computer which we tell our private experiences is like our best friend who keeps our secrets"* (H/8/B).

11. Negative feelings

Table 15: Metaphors identified with negative feelings

	Metaphor Name	**6th grade**	**7th grade**	**8th grade**	**Total**
		f (%)	f (%)	f (%)	f (%)
1	Staring absently	1 (0.22)	-	2 (0.45)	3 (0.67)
2	Having an ignorant person	2 (0.45)	-	-	2 (0.45)
3	Being a slave	1 (0.22)	2 (0.45)	-	3 (0.67)
4	Having a bad feeling	1 (0.22)	1 (0.22)	-	2 (0.45)
5	Having a bad habit	3 (0.67)	2 (0.45)	-	5 (1.13)
6	An increase in our problems	1 (0.22)	3 (0.67)	-	4 (0.90)
	Total				
	Student	9 (2.03)	8 (1.80)	2 (0.45)	19 (4.29)
	Metaphor	6 (5.35)	4 (3.57)	1(0.22)	6 (5.35)

Nineteen students developed 6 metaphors regarding negative feelings (Table 15). The dominant metaphors in this category are as follows: (1) having a bad habit (1.13%), (2) an increase in our problems (0.90%), (3) staring absently (0.67%) and being a slave (0.67%), respectively. The main characteristics of the metaphors within this category are as follows:
1. Owning a computer was identified with a negative feeling (***staring absently, having an ignorant person***)
*"Owning a computer is like **staring absently** because when we are dealing with the computer, we are detached from life, and our communication with the environment is reduced"* (L/8/G)
*"Owning a computer is like **having an ignorant person** because computers block our future"* (L/6/G).

5. DISCUSSION, RESULTS AND SUGGESTIONS

The general aim of this study was to determine the computer self-efficacy perceptions of second grade primary school students and evaluate whether these perceptions are affected in terms of different variables. In addition, metaphors developed by the students regarding computer ownership were determined.

The results demonstrate that the computer self-efficacy perceptions of the students were "high". Students consider themselves as quite compatible regarding computer self-efficacy perceptions. The provision of computer classes to these students during their education had acquainted them with computers at an early age, and the number of computers that they owned affected their computer self-efficacy perceptions positively. This finding is similar to that of previous studies (Akkoyunlu and Orhan, 2003; Bayturan, 2011; Kutluca, 2009; Orhan, 2005; Uzun, Ekici and Sağlam, 2010; Tuti, 2005). However, Ekici and Uzun (2007) identified the computer self-efficacy perception grades of the students in their study as "average". In other studies, the computer self-efficacy perception grades of the students were determined as "low" (Aşkar and Umay, 2001; Akkoyunlu and Kurbanoğlu, 2003; Yılmaz et al., 2006)

The average computer self-efficacy perception of the female students was lower than that of the male students. This finding is similar to that of previous studies (Akkoyunlu and Orhan, 2003; Busch, 1995; Carlson and Grabowski, 1992; Durndell and Haag, 2002; Ekici and Uzun, 2007; Hsu and Huang, 2006; Işıksal and Aşkar, 2003; Miura, 1987; Mumtaz, 2001; Pamuk and Peker, 2009; Topkaya, 2010; Vekiri & Chronaki, 2008). Although there are significant studies on behalf of the female students (Algan, 2006; Berkant and Efendioğlu, 2010; Cassidy and Eachus, 2000; Ekici and Berkant, 2007; Işıksal and Aşkar, 2003), other studies show that

there is no significant gender difference regarding computer self-efficacy perceptions (Adebowale et al., 2009; İmer and Yürekli, 2009; Kutluca, 2009; Olalere, 2005; Özçelik and Kurt, 2007; Özden et al., 2007; Seferoğlu, 2005; Torkzadeh, Pflughoeft and Hall, 1999; Torkzadeh and Koufteros, 1994; Tuti, 2005).

In this research, the students' self-efficacy perceptions did not depend on their class levels. This may be due to the gradual nature of the increase in computer ownership and use. Similar findings have been encountered in the literature. Other research shows no change in computer self-efficacy perceptions as the class level increases (Avis, 2006; Ekici and Uzun, 2007; Kutluca, 2009; Uzun, Ekici and Sağlam, 2010). However, in these studies, the computer self-efficacy perceptions of individuals significantly improved during their education (Akkoyunlu and Orhan, 2003; Baki et al., 2008; Olalere, 2005).

The computer self-efficacy perception grade averages of students in the high socioeconomic category appeared to be higher than those in the middle and lower socioeconomic categories. Although some studies showed that computer self-efficacy perceptions were significantly different in those with parents with high income levels (Kutluca, 2009; Uzun, Ekici and Sağlam, 2010), other studies showed that the computer self-efficacy perceptions of students were not related to the income levels of their families (Becker, 2000; Spera, 2005).
Based on our analysis, no significant difference was found between the average computer self-efficacy perceptions in terms of the students' future professional preferences.

To determine the effect of computer use duration on students' computer self-efficacy perceptions, a one-way variance analysis was conducted. The result of this analysis showed that the average computer self-efficacy perception of the students who used computers for more than five years was higher than that of the other groups. In other studies, computer use duration had a positive effect on computer self-efficacy perceptions, similar to the findings obtained within this study (Akkoyunlu and Kurbanoğlu, 2003; Akkoyunlu and Orhan, 2003; Aşkar and Umay, 2001; Fagan, Neill & Wooldridge, 2003; Usluel and Seferoğlu, 2003).

A significant difference was found between the computer self-efficacy perceptions of the students in terms of the frequency of computer use. Based on the results of the analysis, the average computer self-efficacy perception of students who used their computers every day was higher than that in the other groups. This result may be interpreted as the frequency of computer use being an important factor in improving computer self-efficacy perceptions. Similar results have been encountered in other studies. The computer self-efficacy perceptions of the 6th, 7th and 8th grade students exhibited a significant statistical improvement regarding the frequency of computer use (Aşkar and Umay, 2001; Bovée et al., 2007; Çetin, 2008; Drent & Meelissen, 2008; Hakverdi et al., 2007; Houle, 1996; Karsten and Roth, 1998; Özçelik and Kurt, 2007; Tuti, 2005; Torkzadeh & Koufterous, 1994; Uzun, Ekici and Sağlam, 2010).

We analyzed the data to determine whether a difference existed between the computer self-efficacy perceptions of the students regarding the number of computers at home; based on this analysis, we observed that the computer self-efficacy perceptions of students with 4 or more computers were higher than those with 2-3 computers or 1 computer in their homes. Because the primary students who had 4 or more computers in their homes had computers of their own, they spend more time with their computers; accordingly, their computer self-efficacy perceptions are higher than those of the other groups.
One of the objectives of this study was to set forth the opinions of students regarding computer ownership through metaphors. As there was no information regarding the metaphor studies related to computer ownership, the findings obtained regarding how the students perceive computer ownership will be discussed.

The findings of the study regarding the current mental images of 6th, 7th and 8th grade primary school students respecting computer ownership indicate certain aspects. Firstly, a large number of metaphors are required to explain computer ownership as a whole. For instance, computer ownership was identified with "a reference guide", "a good feeling and a friend", "a precious object", "place and traveling", as well as "staring absently", "having an ignorant person", "being a slave" or "having a bad feeling". At this point, it is impossible to provide an explanation regarding the entire "computer ownership" phenomenon that uses only one metaphor. When the metaphors developed by the students are generally reviewed, it is observed that 5 metaphors stated by the students were dominant: (1) owning a car (11%), (2) having a friend (8.52%), (3) flying like a bird (6.33%), (4) being free (5.20%), and (5) a supplementary source (4.75%), respectively. Generally, the students equated "computer ownership" to a "car", representing the ability to going wherever they want ("flying like a bird" and "being free"). The students developed six metaphors regarding the "friend" theme ("having a knowledgeable friend", "having a very wise friend", "having a friend", "the most loyal friend", "studying with our best friend", and "our friend being with us all the time"). Another factor that drew our attention is that the students equated computer ownership with having a good time and developed 4 metaphors related to "a game" and having "a

toy" ("playing with friends", "having a toy", "playing with my most favorite game", and "games played at home"). Students equated computer ownership with owning an animal and developed 7 metaphors regarding owning an animal. Whereas 106 metaphors reflected positive feelings regarding computer ownership, 6 metaphors reflected negative views. The students mentioned possible problems they might encounter when they have a computer. Within this scope, some students stated that computer ownership was like owning a pet (3.84%), whereas other students associated computer ownership with owning an animal by mentioning various animals (horse, fish, parrot, dog, apple worm, cat). Regarding negative feelings, some students stated that computers stupefied them, increased their problems and considered the use of computers a bad habit. However, the number of students that supported this idea appeared significantly low.

As a result, as mentioned in the literature, computer ownership has a positive effect on self-efficacy (Hakverdi et al., 2007; Houle, 1996; Karsten and Roth, 1998, Torkzadeh and Koufterous, 1994). In this study, the self-efficacy levels of the studied students was high according to the results of the computer self-efficacy scale and the metaphors developed regarding computer ownership; generally, the metaphorical statements used were quite positive. It is obvious that when such applications become widespread, they will significantly contribute to the formation of an information society. Metaphors may be used as strong research tools for determining the mental images of students regarding computer ownership. In this respect, students with different education levels may be asked to develop metaphors regarding different concepts and phenomena related to computer ownership. After analyzing their metaphors and acknowledging the alternative conceptualization provided by these images that are related to specific phenomena, the students may be presented with metaphors that would provide new viewpoints regarding various educational phenomena and situations. In future studies, interviews with students may be organized and studies can be designed that aim to determine their perceptions and views in a more detailed manner regarding computer ownership.

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