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Use of Instructional Technologies by Teachers in the Educational Process: Metaphor Analysis Study

Hakan Sarac *
Ministry of Education, TURKEY

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Abstract: The aim of this research is to determine the thoughts of the teachers about the concepts of "*Smart Board*", "*Computer*", "*Internet*" and "*Social Media*" from the Instructional technologies of the secondary school teachers with different branches through metaphors. In the research, a qualitative research model was used to identify teachers' thoughts in metaphor analysis from various branches about the use of instructional technologies in the national field. Within the scope of the qualitative research model, the phenomenology design was used. In order to find out what kind of thoughts teachers have about teaching materials from the participants "*Smart Board / Computer / Internet / Social Media is like / similar to.....; Because ...*" they were asked to complete their covenants. As a result of the research, 25 valid metaphors belonging to the concepts of smart board, computer, social media and 27 of internet concept were obtained from secondary school teachers. The most book (f = 4) metaphor for smart board concept, brain and memory (f = 2) metaphors for computer concept, most air (f = 3) and medicine, ocean, water (f = 2) metaphors for internet concept and the drug and virus (f = 2) metaphors related to the concept of social media. The metaphors of the concept of smart board are classified into 5 conceptual categories with common characteristics related to each other, 6 categories with common features related to computer and internet concepts, and 7 conceptual categories with social media concept related to each other. In the research, it was reached that the secondary school teachers expressed positive opinions about the concept of smart board and computer, partially negative about the concept of the internet but more negative opinions about the concept of social media.

Keywords: *Computer, internet, metaphor, smart board, social media.*

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Introduction

Information and communication technologies are an indispensable part of our lives today and facilitate life in all areas of life. The use of instructional technologies in the educational process has been included in the training programs and studies and discussions about the effective use of them have been done intensely (Akin, 2007; Demircioglu and Turan, 2012; Ozyilmaz Akamca, 2008). They are tools such as a smart board, a projection device, which are used with the help of computers and computers that come to mind first when it comes to instructional technologies (Akcayir, 2011). However, it cannot be said that only computers and their derivatives encompass instructional technologies. Instructional technologies used according to the characteristics of the subject, learners and teachers can do vary. Products such as cartoons, audiovisual materials, internet technology and its derivatives fall into instructional technology (Keser and Cakir, 2009). By using instructional technologies in the educational process, students can learn according to their own pace, can make boring topics for the students interesting and fun; teachers can use the time effectively and efficiently during the lesson (Dede Er, Sen, Sari and Celik, 2013).

Within the scope of instructional technologies, one of the most frequently used areas is smart board technology. Interactive board and electronic board names are also used for smart board (Sad, 2012). When smart boards are used with regular and accurate methods and adapted to the lesson, they can be used in areas with abstract subjects such as science and mathematics to help students better understand the subject (Riska, 2010; Tataroglu, 2009; Yildizhan, 2013; Zengin, Kirilmazkaya and Kececi, 2011), improve their academic achievement and maintain learning (Dikmen, 2015; Ekici, 2008; Sarac, 2017), facilitate their thinking and improve their interpretive skills (Newton and Rogers, 2003; Simpson, 2010), eliminate misconceptions (Metcalf and Tinker, 2003) and that it helps the student to become better motivated by the lesson because it allows for the implementation of different teaching methods (Adiguzel, Gurbulak and Saricayir, 2011; Elaziz, 2008; Lopez, 2010; Schmid, 2008).

* **Correspondence:**
Hakan Sarac, Science Teacher, Ministry of Education , Istanbul - TURKEY
Email: hknsrcmv@gmail.com

Despite the fact that the use of computers in the educational process is named with many different definitions, the use of computers in education is generally dealt with in two main categories; learning with computer and computer-assisted/based learning (Bybee, Poewll and Trowbridge, 2008). Learning with computer involves using the computer as an auxiliary tool for learning such as homework writing by the student, accessing information using the internet, and making calculations using various softwares (Liao, 2007). There are many studies in the literature that investigate the effects of computer- assisted/based instruction on variables such as academic achievement, holding, motivation, and the positive result (Bayturan, 2011; Demir and Basol, 2013; Dincer, 2015; Ilyasoglu, 2012; Ozturk, 2014).

Today, increasingly important and indispensable in our lives, internet technology has many uses for different purposes. With all of this, internet technology is also used for educational purposes and the use of internet technology in educational process is spreading rapidly (Kocadag, Aksoy and Zengin, 2014). In the literature, it can be seen that internet technology enables millions of people to communicate with each other and share information (Tavsancil and Keser, 2002), the effectiveness of internet-based distance education (Bolat, Aydemir and Karaman, 2017; Sahin and Tekdal, 2005), the more effective use of internet technology by teachers and students (Bas, 2011; Eroglu, Unlu, Eroglu and Yilmaz, 2011; Tuncer and Aytac, 2012), the visual use of internet technology and the virtual interaction with audio and video channels contributing to the education of the students (Milliyetci, 2008), the attitudes of the students (Balay, Kaya and Cevik, 2014) and the teachers towards the internet and the students working towards the internet dependency (Tuncay and Horzum, 2013).

The entire set of tools, services and applications that interact with users using internet technologies is expressed as social media (Boyd, 2008). In short, the dialogues and exchanges that individuals make with each other on the internet create social media (Ozturk and Talas, 2015). Social networking websites, which are popular examples of social media tools, can show internet applications such as facebook and twitter. Social media has many features that can improve the educational process. One of the most fundamental features of social media-supported education is that students in the traditional education system collect and use digital tools, increasing teacher interaction (Yaros, 2011). Students and teachers can easily create communities for educational purposes, carry out sharing among themselves, communicate and receive feedback by following simple steps through social network web sites. Social networking websites also provide opportunities to support the learning process of the students by enriching the learning and educational processes with materials such as text, video, audio, and to support the teacher in the teaching and evaluation process (Pollara and Zhu, 2011).

When we perceive concepts, we generally refer to the concept that we want to perceive as another concept, or we express commonalities between two concepts. This method, which is used, points to the metaphors expressed as a way of reasoning (Ekici, 2016). Metaphors first appeared in the 1980's as "*The theory of mental metaphors*" developed by Lakoff and Johnson. Metaphors are very influential in learning abstract concepts that can be learned from indirect ways (Lakoff and Johnson, 1980). Lakoff and Johnson (1980) described metaphor as something similar to something, to understand and experience something else. Metaphors are expressed as one of the most powerful mental tools that construct, direct and control our ideas about the formation of concepts and processes, which are effective when we concretize concepts and communicate (Cisek, 1999; Guerrero and Villamil, 2002; Hogler, Gross, Hartman and Cunliffe, 2008; Shaw and Mahlios, 2011). Within the context of the use of instructional technologies; The results obtained from these studies are shown in Table 1 in general.

Table 1. Metaphor analysis studies in Instructional technologies

Researchers	**Metaphor Concept**	**Participants**	**Sample Size**	**Number of metaphors**	**Number of conceptual categories**
H. Yalap and A. Yilmaz (2017)	Smart Board	Turkish teachers	25	25	4
G. Ekici (2016)	Computer	Teacher candidates	286	123	6
M. Senel (2016)	Mobile Phone	Teacher candidates	123	69	6
A.O. Akturk, S. Mihci and I.Celik (2015)	Smart Board	High school students	162	41	6
S. Ozer and Y.K. Turel (2015)	Interactive e-Book	Teacher candidates	158	151	5
M. Fidan (2014)	Social Network	Teacher candidates	176	108	9
F. Eren, I.Celik and A.O. Akturk, (2014)	Facebook	Secondary school students	144	37	5
T. Kocadag, M. E. Aksoy and K. Zengin (2014)	Internet	Teacher candidates	138	70	9
A. Guneyli and A. Ozkul (2013)	Computer	Teacher candidates	81	47	3
S. Sahin and M. H. Baturay (2013)	Internet	High school students	251	92	8
E. Senyuva and H. Kaya (2013)	Internet	Nursing students	500	204	10
F. Eren, I. Celik, M. Dikmenli, I. Sahin and M. Shelley (2012)	Internet	Teacher candidates	162	66	8
A.N. Coklar, L.Vural and I.Yuksel (2010)	Computer	Teacher candidates	67	38	5

Nowadays, "*Smart Board*", "*Computer*", "*Internet*" and "*Social Media*" which are instructional technologies have become one of the important requirements that every branch teacher can use in their lessons in terms of effective education. In the literature, it is observed that teacher and teacher candidates have been working on the instructional technologies on a singular basis in the education and educational process. However, in general, studies on teaching materials on multiple scales are not sufficient. During the educational period of this study; it is thought that the teachers in different disciplines will contribute to the literature about what they think about teaching materials, the researchers will shed light on the researches of metaphor analysis about the technological materials and the importance of developing the use of technological materials in educational process.

The aim of the research is to determine the perceptions related to the smart board, computer, internet and social media concepts of the instructional technologies of the teachers in different branches with the metaphor analysis research. Sub-problems identified in this direction are as follows.

- What are the metaphors that teachers in different branches express about the concepts of "*Smart Board*", "*Computer*", "*Internet*" and "*Social Media*"?
- In what conceptual categories can the metaphors of each concept identified by teachers in different disciplines be expressed in terms of common characteristics?

Methodology

Research Model

In the research, a qualitative research model was used to identify teachers' thoughts in metaphor analysis from various branches about the use of instructional technologies (smart board, computer, internet, social media) in the national field. Within the scope of the qualitative research model, the phenomenology design was used. Phenomenology is used to reveal common practices and to describe and describe the meanings/occurrences created by the participants (Annells, 2006). The basis of the phenomenology pattern is the individual experiences. This researcher is interested in the subjective experience of the participant and examines the meanings they perceive and upload to the events. In this research, it is important not to make generalizations, but to identify facts and to draw conclusions based on personal experiences (Akturan and Esen, 2008; Creswell, 2007).

Participants

This research was carried out in the fall semester of 2017-2018 educational year with the participation of 32 volunteers from 42 teachers working in various branches in a school in the province of Umraniye, Istanbul. Demographic information on the branch, gender, occupational seniority and frequency of technology use of the teachers participating in the survey are shown in Table 2.

Table 2. Demographic Information of participants

Demographic information of the teachers		Frequency (f)	Percentage (%)
Teacher's sectors	Science	9	29
	Mathematics	6	19
	Turkish	4	13
	Social science	4	13
	Information technologies	4	13
	English	1	3
	Physical education	2	6
	Music	2	6
Gender	Female	18	58
	Male	14	42
Occupational Seniority (Year)	1-4	8	26
	5-9	9	26
	10-14	4	13
	15 and over	11	35
Technological Usage Frequency	Always	19	58
	Sometimes	13	42
	Newer	-	-
	Total	32	100

When the distribution according to the branch of the teachers participating in the survey according to the data in Table 1 is examined; 29% are in Science, 19% in Mathematics, 13% in Turkish, Social sciences and information technologies, 6% in Physical education and Music, and 3% in English. Teachers were 58% female and 42% male in terms of sex; in terms of occupational seniority, 26% between 1-4 and 5-9 years; 13% between 10-14 years and 35% 15 years and over. In terms of the frequency of use of technology, teachers indicated that 58% always use occasional technology and 42% use occasional technology.

Collection of Data

In order to reveal the thoughts of the teachers who work in different branches participating in the research with the help of metaphor analysis; "*Smart board is like / similar to…..; Because ... ", "Computer is like / similar to…..; Because ...* ", "*Internet is like / similar to…..; Because ...* " and " *Social media is like / similar to…..; Because ...* " a form has been written in which the expressions are written. In this form, demographic information of the teachers, the meaning of the word "*Metaphor*", explanation and some examples are given. It is also desirable for teachers to write their thoughts, focusing on only one metaphor for each concept on the templates for instructional technologies. A total of 40 minutes were given to the teachers in a meeting environment to create metaphor for each concept. There are no limitations on the metaphors that teachers will create to express their thoughts comfortably.

Analysis of Data

Content analysis method which is one of the data evaluation methods used in qualitative researches was used in the research. Content analysis is a scientific approach involving verbal, written and other data being examined objectively and systematically and organized according to certain categories (Bilgin, 2006; Lichtman, 2010). Accordingly, content analysis can be expressed as an interpretation by putting together similar data within the framework of certain concepts and categories, and arranging them in a way that the reader can understand (Ekici, 2016).

When starting the analysis of the data, it was firstly checked that the forms given to the teachers were not properly filled in for the purpose of the research. The forms that were not filled in accordance with the survey or those that do not belong to the relevant concepts were not evaluated. At this point, the lack of metaphor has not been assessed for metaphors, because the forms containing situations such as leaving the section empty or making no logical explanation.

The analysis and interpretation of the metaphors that the teachers have indicated in the research were made by following the steps of metaphor analysis and analysis used by Ekici (2016). These steps;

- Examination phase of data forms obtained from teachers,
- Elimination phase of non-conforming forms,
- Review and compile data forms,
- The order of the numbering of forms accepted to the evaluation,
- The stages of determining metaphors from forms accepted for evaluation,
- Determining the distribution of categorizations by examining the obtained metaphors,
- Stage of validity and reliability,
- The calculation of the frequencies of the obtained metaphor codes,
- Interpretation of data.

By examining the logical reasons for the obtained metaphors; It is checked whether the logical basis is correct. Some metaphors that are not logically based on instructional technologies have been left out of categorization. Some of the forms that have not been evaluated are shown below as an example.

- "Smart board is like *writing articles in virtual books*; Because, *it does both book and book keeping*."
- "The computer is like *a window*; Because, *it opens as soon as it opens*."
- "Social media is like *an international neighborhood*; Because, *it has good and bad sides of being a neighbor*."
- "Social media is like *mixed hair*; Because *it is very complicated and tiresome*."

Expressions that express the opinion of the form has been left out of the classification.

In these examples, the first part is understandable, but it is not taken into consideration because it lacks the logical basis as the second part does not provide a contribution to the corresponding grip. In this case, 4 statements for smart board concept, 5 for computer concept and 5 for social media concept were excluded from evaluation. All of the metaphors developed for the concept of the internet have been evaluated.

The documents were evaluated separately by two different coders in the field of educational researches as to which conceptual category the metaphors revealed by the teachers in the metaphor-conceptual category matched. After coding, the forms of both experts were evaluated mutually. As a result of the evaluation, the credibility of the codes was calculated to be 90% according to the formula of the security level (reliability = opinion assembly/opinion assembly + opinion separation) developed by Miles and Huberman (2002). According to the reliability level formula, results of 70% or more are sufficient for reliability (Yildirim and Simsek, 2011). Accordingly, it can be said that the metaphor-conceptual category matching codes determined for the purpose of the research are reliable.

According to this, 28 metaphors belonging to the concept of smart board belonging to the instructional technologies that teachers have created have 5 categories, 27 metaphors belonging to the concept of computer 6 categories, 32 metaphors belonging to the concept of internet have 6 categories and 27 metaphors belonging to the concept of social media are collected under 7 categories. Tables were created about the metaphors that teachers created and the frequency of metaphor-conceptual category matching.

Findings

Thirty-two (76%) of the 42 teachers who worked in various branches in the secondary school in which the research was conducted voluntarily answered their thoughts on the materials of instructional technologies to the form given to them.

Findings of the first sub-problem

The first sub-problem of the research is; "*What are the metaphors that teachers in different branches express about the concepts of "Smart Board", "Computer", "Internet" and "Social Media" ?*" the findings of the questionnaires were first investigated.

The metaphors identified for each concept of instructional technologies are shown in Table 3.

Table 3. Metaphors of teachers related to Instructional Technologies

No	Smart Board		Computer		Internet		Social Media	
	Metaphor	**(f)**	**Metaphor**	**(f)**	**Metaphor**	**(f)**	**Metaphor**	**(f)**
1	Book	4	Memory	2	Air	3	Drug	2
2	Chess	1	Brain	2	Medicine	2	Virus	2
3	Candy	1	Soul	1	Ocean	2	Mint	1
4	Elektronic stuff	1	Medicine	1	Water	2	Cigaret	1
5	Play dough	1	Fire	1	Library	1	Balloon	1
6	Imagination	1	Horse	1	Savior	1	Life	1
7	Teacher	1	Book	1	Pen	1	Friend-killer	1
8	Eye	1	Hand-arm	1	Seed	1	Waste of time	1
9	Electricity	1	Secretary	1	Dependency	1	World	1
10	Library	1	Toy	1	Antibiotic	1	Community centers	1
11	Television	1	Head	1	Life	1	Driving	1
12	Catalyzer	1	Fairy	1	City	1	Blind node	1
13	Safe	1	Human	1	Bell	1	Second face	1
14	Lamp	1	Eat	1	Guide	1	Leech	1
15	Magic wand	1	Magnet	1	Cigaret	1	Make-up	1
16	Package soup	1	Car	1	Space	1	Knife	1
17	Picture	1	Carrier	1	Supermarket	1	Cracking sunflower	1
18	Black board	1	Antique	1	Information garbage	1	Genie	1
19	Telescope	1	Digestive system	1	Abstract world	1	Game	1
20	Air way	1	Virtual world	1	Teacher	1	Foe	1
21	Friend	1	Store	1	Oil	1	Spider web	1
22	Life buoy	1	Airplane	1	Car	1	Harmful habit	1
23	Home room	1	Elevator	1	Virus	1	Cat	1
24	Brain	1	Clothes	1	Eat	1	Test tube	1
25	Broccoli	1	Factory	1	Goods	1	Parsley	1
26					Candy	1		
27					Dress cabinet	1		
Total		28		27		32		27

When Table 3 is examined, it is seen that the teacher with 32 different branches produced 25 different metaphors related to the concept of "*Smart Board*". Among these metaphors, the "*book*" metaphor, which is the most produced metaphor, was produced by 4 people and the other metaphor was produced by 1 person. It is seen that it produces 25 different metaphors related to the concept of "*Computer*". Among these metaphors, the "*memory*" and "*brain*" metaphor, which are the most produced metaphor, are produced by 2 persons and the other metaphors by 1 person. It seems that it produced 27 different metaphors related to the concept of "*Internet*". Among these metaphors, "*air*", which is the most produced metaphor, was produced by 3 people, "*medicine* ", "*ocean*" and "*water*" metaphor were 2 persons, and other metaphors were produced by 1 person. It is seen that it produced 25 different metaphors related to the concept of "*Social Media*". Among these metaphors, the metaphor of "*drug*" and "*virus*", which are the most produced metaphors, were produced by two persons, and the other metaphors by one person.

Findings of the second sub-problem

The second sub-problem of the research is; "*In what conceptual categories can the metaphors of each concept identified by teachers in different disciplines be expressed in terms of common characteristics?*" the findings of the questionnaires were first investigated. The conceptual categories determined for the smart board and computer concepts are shown in Table 4.

Table 4. Conceptual categories of smart board and computer metaphors

Smart Board			Computer		
Conceptual Categories	**Metaphors**	**(f)**	**Conceptual Categories**	**Metaphors**	**(f)**
1-Smart Board as a tool to help learning	Book Library Black board	(f)=6	1-Computer as a tool to help learning	Book Secretary Human Carrier Car Horse	(f)=6
2. Smart Board as an indispensable tool for life	Teacher Friend Eye Brain	(f)=4	2. Computer as an indispensable tool for life	Brain Head Hand-arm Memory Digestive system	(f)=7
3-Smart Board as entertainment tool	Chess Electronic stuff Play dough Television Magic wand Picture Telescope	(f)=7	3-Computer as entertainment tool	Toy Magnet Antique	(f)=3
4. Smart Board as energy and motivation tool	Candy Imagination Electricity Catalyzer Lamp Package soup Life buoy Broccoli	(f)=8	4. Computer as energy and motivation tool	Eat Medicine Fire	(f)=3
5- Smart Board as a tool that changes according to purpose of use	Safe Air way Home room	(f)=3	5- Computer as a tool that changes according to purpose of use	Store Airplane Elevator Clothes Factory	(f)=5
			6-Computer perceived as an intangible tool	Soul Fairy Virtual world	(f)=3
	Total	(f)=28		Total	(f)=27

According to Table 4, the metaphors developed by the teachers with different branches on the concept of "*Smart Board*" are collected under 5 conceptual categories in total. These are; smart board as a tool to help learning (f=6), smart board as an indispensable tool for life (f=4), smart board as entertainment tool (f=7), smart board as energy and motivation tool (f=8) and smart board as a tool that changes according to purpose of use (f=3). According to this, the metaphors developed for the concept of smart board are gathered under the conceptual categories of energy, motivation and entertainment tool. Some examples of metaphors expressed by teachers (Female-F, Male-M) according to sequence numbers for each conceptual categorization on the Smart board concept are shown below.

- Smart board is as a tool to help learning, as an example of conceptual category; 15M coded Math teacher said that: "*Smart board is like book; Because the unit has both narrative and question-solving sections.*"
- Smart board is as an indispensable tool for life, as an example of conceptual category; 28F coded Math teacher said that: "*Smart board is like a friend; Because the teacher can help with all the necessary support during the lesson*."
- Smart board is as entertainment tool, as an example of conceptual category; 1M coded Music teacher said that: "*Smart board is like chess; Because step by step during the course will go to the end.*"
- Smart board is as energy and motivation tool, as an example of conceptual category; 9F coded English teacher said that: "*Smart board is like imagination; Because, during the lesson, we can explain everything we have theoretically told and difficult to practice*. "
- Smart board is as a tool that changes according to purpose of use, as an example of conceptual category; 27F coded Science teacher said that: "*Smart board is like airway; Because you can get most of the distance by road, it is not necessary.*"

In the continuation of Table 4, the metaphors developed for the concept of "*Computer*" are grouped under 6 conceptual categories. These are; Computer as a tool to help learning (f=6), computer as an indispensable tool for life (f=7), computer as entertainment tool (f=3), computer as energy and motivation tool (f=3), computer as a tool that changes according to purpose of use (f=5) and computer perceived as an intangible tool (f=3). According to this, the metaphors

developed for the concept of computer are most indispensable tool for life and the tool for help learning is collected under conceptual categories. Some examples of metaphors expressed by teachers (Female-F, Male-M) according to sequence numbers for each conceptual categorization on the computer concept are shown below.

- Computer is as a tool to help learning, an example of conceptual category; 10F coded Social sciences teacher said that "*The computer is like a secretary; Because every information you want to write to the document without writing it to you instantly.*"
- Computer is as an indispensable tool for life, an example of conceptual category; 31M coded Science teacher said that "*The computer is like brain; Because it functions like a data storage center.*"
- Computer is as entertainment tool, an example of conceptual category; 11M coded Physical education teacher said that "*The computer is like our game; Because we have become incapable of elimination.*"
- Computer is as energy and motivation tool, an example of the conceptual category; 9F coded English teacher said that "*The computer is medicine; Because if you need it, use it and get it done.*"
- Computer is as a tool that changes according to purpose of use, an example of conceptual category; 26F coded Science teacher said that; "*The computer is like an airplane; Because, when used, the process is accelerated and a quick result is achieved, and if it is not used, it will be a waste of time.*"
- Computer perceived as an intangible tool, an example of conceptual category; 13F coded Math teacher sais that; "*Computer is like a fairy; Because it is very complicated and difficult to work with the sign of a finger*."

The conceptual categories of the internet and social media concepts are shown in Table 5.

Table 5. Conceptual categories of Internet and social media metaphors

Internet			**Social Media**		
Conceptual Categories	**Metaphors**	**(f)**	**Conceptual Categories**	**Metaphors**	**(f)**
1- Internet as a tool to help learning	Library Pen	(f)=2	1- Social media perceived as an intangible tool	Genie	(f)=1
2. Internet as an indispensable tool for life	Air Water Bell Life Teacher	(f)=8	2. Social Media as an indispensable tool for life	Life	(f)=1
3. Internet as energy and motivation tool	Medicine Savior Antibiotic Candy Eat Oil	(f)=7	3- Social Media as entertainment tool	Make-up Balloon Parsley Game	(f)=4
4- Internet as a tool that changes according to purpose of use	Goods City Dress cabinet Car	(f)=4	4. Social Media as energy and motivation tool	Cracking sunflower seeds	(f)=1
5-As information source Internet	Abstract world Information garbage Ocean Space Supermarket Guide	(f)=7	5- Social Media as a tool that changes according to purpose of use	Mint Knife Test tube Driving	(f)=4
6-As a harmful product Internet	Seed Dependency Cigaret Virus	(f)=4	6-As information source Social Media	Virtual world Community centers	(f)=2
			7-As a harmful product Social Media	Drug Virus Cigaret Friend-killer Waste of time Blind node Second face Leech Foe Spider web Harmful habit Cat	(f)=14
	Total	(f)=32		Total	(f)=27

According to Table 5, the metaphors developed by the teachers with different branches on the concept of "*Internet*" are grouped under 6 conceptual categories. These are; Internet as a tool to help learning (f=2), internet as an indispensable tool for life (f=8), internet as energy and motivation tool (f=7), internet as a tool that changes according to purpose of use (f=4), As information source internet (f=7) and as a harmful product internet (f=4). According to this, the metaphors developed for the concept of the internet are gathered under the conceptual categories as energy, motivation and information source with the most indispensable tool for life. Some examples of the metaphor expressed by teachers (Female-F, Male-M) according to sequence numbers for each conceptual category about the internet concept are shown below.

- Internet is as a tool to help learning, an example of the conceptual category; 1M coded Music teacher said that; "*Internet is like a library; Because you can find everything you are looking for.*"
- Internet is as an indispensable tool for life, an example of conceptual category; 11M coded Physical education teacher said that; "*Internet is like air; Because without it life is unimaginable.*"
- Internet is as energy and motivation tool, an example of conceptual category; 26F coded Science teaching said that; "*Internet is like oil; Because if it does not exist, daily life will be delayed and the needs become unattainable.*"
- Internet as a tool that changes according to purpose of use, an example of conceptual category; 27F coded Science teacher said that; "*Internet is like a car; Because when used correctly, it can make people's lives easier, and they can be harmful if used incorrectly.*"
- As an example of the conceptual category of the internet as a source of information; 14F coded Science teacher said that; "I*nternet is like a supermarket; Because you will find everything you are looking for.*"
- Internet as a harmful product, as an example of conceptual category; 19F Turkish language teacher "*Internet is like cigarettes; Because you are addictive when you get used to it.*"

In the continuation of Table 5, the metaphors developed for the concept of "*Social Media*" are grouped under 7 conceptual categories. These are; Social media perceived as an intangible tool (f=1), social media as an indispensable tool for life (f=1), social media as entertainment tool (f=4), social media as energy and motivation tool (f=1), social media as a tool that changes according to purpose of use (f=4), as information source social media (f=2) and as a harmful product social media (f=14). Accordingly, the metaphors developed for the concept of Social Media are collected under the conceptual categories of the most harmful product source. Some examples of metaphors expressed by teachers (Female-F, Male-M) according to their sequence numbers for each conceptual category on the social media concept are shown below.

- Social media perceived as an abstract tool, is an example of conceptual category; 22M coded Science teacher said that; "*Social media is like a genie; Because you see what kind of person you are, you do not know what your true identity is, nor do you trust your information.*"
- Social media as an indispensable tool for life, is an example of conceptual category; 6M coded Physical teacher said that; "*Social media is like life; Because of him, we are constantly interacting with people.*"
- Social media as a tool of entertainment, is an example of the conceptual category; 19F Turkish language teacher said that; "*Social media is like a game; Because most people are entertainment places.*"
- Social media as a source of energy and motivation, is an example of conceptual category; 21F coded Science teacher said that; "*Social media is like a nuclear fence; Because you cannot leave until the end of the habit.*"
- Social media as a tool for changing the purpose of use, is an example of conceptual category; 20K coded Science teacher said that; "*Social media is like a knife; Because, according to its usage, you can cut it to the fruit or man.* "
- Social media as a source of information, is an example of conceptual category; 14F coded information technology teacher said that; "*Social media is like public centers; Because it brings people together and gives them the opportunity to share what they know.*"
- Social media as a harmful product, is an example of conceptual category; 11M Mathematics teacher said that; "*Internet is like drugs; Because it's addictive as you use it.*"

Discussion, Conclusions and Suggestions

In the research, the thoughts of the secondary school teachers of different branches related to the smart board, computer, internet and social media, which are the instructional technologies in the educational process, were determined by the metaphor analysis method. Detected metaphors have often been expressed once. This is explained by Cisek (1999) as an important indication that metaphors differ depending on individual experiences. Too much of the metaphor variety can be expressed as a part of the secondary school teachers' perspectives, productive mentality and richness of cognitive structures (Ekici, 2016).

It has emerged that middle school teachers produced 25 different metaphors related to the concept of "*Smart Board*". Among these metaphors, the book metaphor which is the most produced metaphor is 4 people; other metaphors were produced by 1 person. It can be said that the most frequently expressed book metaphor is included in the smart board

concept category as a tool to help learners perceive the smart board as a teaching material in classical meaning in general. While expressed metaphors are often lifeless metaphor, they are expressed in living metaphors such as teacher, friend, eye, and brain. All of the metaphors expressed on the smart board seem to be in the positive direction. In addition, the metaphor expressed by the teachers has come to the consensus on smart boards as a source of energy, motivation and entertainment in the categorization of conceptual categories in terms of common features. In this situation, it can be said that the use of smart board in the education process is effective in teachers, that it provides motivation in lecturing and thus contributes positively to the attitude of the students to the success of the lesson. The results obtained from the study are similar to those obtained from similar studies (Dikmen, 2015; Ekici, 2008; Sarac, 2017; Tataroglu, 2009; Yildizhan, 2013; Zengin, Kirilmazkaya and Kececi, 2011) in which the effect of smart board use on learning products is investigated.

In the literature, in the educational process, the mental images of Turkish teachers about the concept of "*Smart Board*" (Yalap and Yilmaz, 2017), the perceptions of the secondary school high school students about the concept of "*Smart Board*" (Akturk, Mihci and Celik, 2015), perceptions of "*Interactive e-books*" of teacher candidates in similar field technologies (Ozer and Turel, 2015) and perceptions of "*Mobile phone*" of 3rd and 4th grade students studying English language education (Senel, 2016) metaphor analysis studies to detected. In Yalap and Yilmaz's (2017) study, 25 different metaphors were identified for the smart board. All of the detected metaphors have been expressed once. In addition, the metaphors of teachers have expressed towards the smart board are often positive. In the study carried out by Akturk, Mihci and Celik (2015), 41 different metaphors were identified for the smart board. Teachers, friends, books, and cinema metaphors are among the most identified metaphors. In addition, the metaphors that high school students have expressed towards the smart board are often positive and lifeless metaphors have been used. In Ozer and Turel's (2015) study, 151 different metaphors were identified for the interactive e-book. It is also the result that prospective teachers have found only positive metaphors for interactive e-books and that they see the use of interactive e-books more attractive. In his study of Senel (2016), 69 different metaphors for mobile phones were identified. The most expressed metaphors were friends and water. It has also been found out that prospective teachers generally have positive views and approaches about mobile phones. It can be said that the metaphors of the concept of smart board in the research carried out are generally positive and the results obtained from studies done in similar areas (Akturk, Mihci and Celik, 2015; Ozer and Turel, 2015; Senel, 2016; Yalap and Yilmaz, 2017) in literature overlap.

It has emerged that middle school teachers produce 25 different metaphors related to the concept of "*Computer*". These metaphors memory and brain which are the most produced metaphor among these metaphors are 2 persons; other metaphors were produced by 1 person. The most expressed memory and brain metaphors are indispensable for life, and they can be expressed as a teaching material that teachers cannot teach effectively without computers in general, to be placed under the computer concept category as a means of learning. The secretary has been expressed in living metaphors such as human, horse, soul, fairy, and brain, although the expressed metaphors are often seen as inanimate metaphors. Although the metaphors expressed on the computer are generally seen as positive, they are in metaphors such as medicine and fire which may have negative effects on the purpose of use. In addition, the metaphor expressed by the teachers is more indispensable for life in the classification of conceptual categories in terms of common features, and the view of the computer as a tool for learning is reached. This situation can be considered as the fact that the use of computers is a necessary course material in the education process in the teachers and thus will provide the contributions to ensure the desired efficiency in education. This result, which is obtained from the research, is similar to the results obtained from similar studies (Bayturan, 2011; Demir and Basol, 2013; Dincer, 2015; Ilyasoglu, 2012; Ozturk, 2014) in which the positive contribution of computer use to the educational process is searched.

In the literature, perceptions developed by prospective teachers about the concept of "*Computer*" (Ekici, 2016), the perceptions of the "*Computer*" concept of the candidate teachers of Turkish Language and History department (Guneyli and Ozkul, 2013) and to determine the metaphors developed by computer engineering and computer and instructional technologies education students on the concept of "*Computer*" (Coklar, Vural and Yuksel, 2010) metaphor analysis studies were carried out. In the study of Ekici (2016), 123 different metaphors were identified for the computer. Metaphors expressed more than once about computer concept, brain, television, book, smoking, encyclopedia, library, universal information box, friend, mobile phone and world. In addition, the metaphor for which prospective teachers have expressed towards the computer has often been developed for positive and inanimate objects. In the study conducted by Guneyli and Ozkul (2013), 47 metaphors were identified for the computer. Detected metaphors have often been expressed once. The metaphor expressed more than once about the concept of computer has become brain and human. In addition, the metaphor for which prospective teachers have expressed to the computer is often positive. In their study of Coklar, Vural and Yuksel (2010), 38 different metaphors the computer were identified. Computer Engineering (CE) and Computer and Instructional Technology Education (CITE) students are generally found to have positive views and approaches about computers. It can be said that the metaphors related to the concept of computer in the research done are generally positive, and that the results obtained from studies (Coklar, Vural and Yuksel, 2010; Ekici, 2016; Guneyli and Ozkul, 2013) done in similar areas in the literature overlap with the result of expressing mostly inanimate metaphors.

It is seen that middle school teachers produced 27 different metaphors related to the concept of "*Internet*". Among these metaphors, the most produced metaphor of air was produced by 3 people, the metaphor of medicine, ocean and

water was produced by 2 people, and the other metaphors were produced by 1 person. Under the internet concept category as the indispensable tool for the life of the most expressed air and water metaphors, under the internet concept category as the source of energy and motivation of the drug metaphor under the internet and concept category and the ocean metaphor information source it can be said that internet technology is perceived as a teaching material in the form of energy, motivation and information source in education so that teachers will not be able to educate without internet technology in general. While expressed metaphors are often inanimate metaphor, they are expressed in living metaphors such as life, teacher, and virus. While the metaphor expressed on the computer is generally seen as positive, there are metaphors such as discrete weed, addiction, cigarette and virus, which can have deleterious effects when used. Moreover, the metaphor expressed by the teachers is more indispensable for life in the classification of conceptual categories in terms of common features, and the idea of the Internet as a tool of energy and motivation and information source is reached. In this case, it can be considered that the use of internet technology is a course material in the form of motivation tool and necessary material in the education process of the teachers, and that the desired efficiency is ensured in education by using it as a resource to reach the desired information. This result, which is obtained from the research, is similar to the results obtained from the studies (Bas, 2011; Bolat, Aydemir and Karaman, 2017; Eroglu, Unlu, Eroglu and Yilmaz, 2011; Sahin and Tekdal, 2005; Tuncer and Aytac, 2012) of effectiveness of the internet based education in the educational process.

In the literature metaphor analysis studies have been carried out about the determination of internet metaphors of the students of CEITD-Computer Education and Instructional Technology Department (Kocadag, Aksoy and Zengin, 2014), the metaphors of the internet of the high school students (Sahin and Baturay, 2013), the metaphors of the internet of the nursing school students (Senyuva and Kaya, 2013) and the metaphors of the internet of the biology department students (Eren, Celik, Dikmenli, Sahin and Shelley, 2012). In their study of Kocadag, Aksoy and Zengin (2014), 70 different metaphors the CEITD Students' internet concept were identified. The metaphor most expressed about the concept of the internet has been shopping center, supermarket, friend, book, sun, game, fire, arena, labyrinth and agent. CEITD Students' metaphors for computing are often positive. But metaphors such as fire and agent, which are negative about the internet, have also been detected. In their study by Sahin and Baturay (2013), 92 different metaphors the internet concept of secondary school students was identified. The most expressed metaphors about the concept of the internet are water, life, books, information store and library. The metaphors that high school students have expressed towards the computer are often positive. But at a lesser extent, metaphors such as cigarettes and devils, which are negative about the internet, have also been identified. In the study conducted by Senyuva and Kaya (2013), 204 metaphors for the concept of internet were identified. The metaphor that students of nursing school most expressed about the concept of the internet became library, world and book. Eren, Celik, Dikmenli, Sahin and Shelley (2012) conducted 66 different metaphors the concept of the internet. The biology department students have become the metaphors that most express about the concept of the internet, library, encyclopedia, book, scientist, brain and treasure. In addition to having mostly positive concepts about the internet, the Biology department students have some negative concepts such as addiction source and bad category sources. In addition, the metaphors identified are mostly gathered under the knowledge categories and educational toolkit concept categories. In the study, it can be said that the metaphor for the concept of the internet is generally favorable, and the result of expressing more inanimate metaphors overlaps with the results obtained from studies (Eren, Celik, Dikmenli, Sahin and Shelley, 2012; Kocadag, Aksoy and Zengin, 2014; Sahin and Baturay, 2013; Senyuva and Kaya, 2013) conducted in similar areas in the literature.

It is seen that the secondary school teachers produced 25 different metaphors related to the concept of "*Social Media*". Among these metaphors, the metaphor of drug and virus, which are the most produced metaphor, are 2 persons; other metaphors were produced by 1 person. It can be said that the most cited drug and virus metaphor is included in the social media concept category as a harmful product, which means that teachers are generally perceived to be very damaging to social media technology. It is reinforced by the fact that 14 out of the 27 participants on the concept of social media express harmful metaphors about the social media concept. Although expressed metaphors are often inanimate metaphor, they are expressed in living metaphors such as genie, leech, virus, and gossip woman. Metaphors expressed in terms of negative and harmful in general about social media are drugs, viruses, cigarettes, friends, leech, enemies and harmful habits. The metaphors expressed by the teachers were more harmful in the classification of conceptual categories in terms of common features, and then the social media view was reached as a tool that changed according to the purpose of use and information and entertainment. The results obtained from social media effectiveness studies (Pollara and Zhu, 2011; Yaros, 2012) in the literature of the social media outcome as a means of entertainment and information obtained from the research, as a tool that changes according to the purpose of use, are similar to each other.

In the literature, metaphor analysis studies were carried out to determine the perceptions of the candidates about the concept of "*Social network*" (Fidan, 2014) and the perceptions of the middle school students about the concept of "*facebook*" (Eren, Celik and Akturk, 2014). In his study of Fidan (2014), 108 different metaphors were identified for the concept of "*Social network*" for teacher candidates. The most expressed metaphors about the concept of social network are swamp, language and letter. The metaphor that teacher candidates have expressed towards the concept of social network has often been in the form of addictive and harmful concepts. Some of these metaphors are cigarette, virus, drug, gambling, alcohol, swamp, time killer, coffee shop, cancer, gossip and snake. In Eren, Celik and Akturk's (2014)

study, 37 different metaphors the concept of "*facebook*" have been determined. These metaphors are friends, chocolate, cola and life have been the most expressive expressions about the facebook concept of middle school students. Along with this, the metaphors of cigarette, alcohol, drug and virus has been expressed in the facebook category as an addictive and harmful tool. In addition, the metaphors identified are more useful and the source of dependence is grouped under the tool concept categories. As a result, it has been found out that middle school students have very positive concepts about facebook. The result of the research that the metaphors related to the concept of social media are generally considered to be a harmful product and the study done by Fidan (2014) in the literature are similar to the results obtained for the concept of "*social network*" of teacher candidates. In Eren, Celik and Akturk's (2014) study, the conclusion that middle school students towards the concept of "*facebook*" have very positive concepts is partially similar.

The following suggestions can be made in the light of the results of the research;

- In-service seminars can be held on utilizing instructional technologies for current teachers and increasing productivity in education.
- Research can be conducted on the use of instructional technologies in the educational process as to what might be the role of the teacher and the student.
- According to the results of the research, it is possible to carry out in-depth researches on the reasons why the metaphors detected in the field to the concept of social media are generally negative.
- Research can be conducted on the metaphorical perceptions of participants in different levels of education on the concepts of instructional technologies.
- The use of different materials (microscopes, mobile phones, tablets, etc.) belonging to instructional technologies in the educational process can be used to investigate the relevant metaphorical perceptions.

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