Crawling in the Virtual Environment: Prospective Teachers' Usage of *Google* Search Engine

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Abstract

Problem Statement: The Internet is an important source whereby users attempt to meet their need of information through using one of the popular search engines. Likewise, research studies demonstrate that students and prospective teachers often visit the Internet to locate the information they need. This circumstance brings to mind the question of whether the users are equipped with the required knowledge and skills to use a search engine of their choice. When the literature is analyzed, it is seen that the issue is overly neglected.

Purpose of Study: The purpose of this research is to identify prospective teachers' proficiencies in using a search engine. It first attempts to identify the preferred information sources by prospective teachers. Then it aims to discover whether prospective teachers are aware of the basic *Google* commands and how their awareness changes depending on the year spent in a teacher education program.

Methods: Qualitative survey methodology was used in this study. Participants were 328 prospective teachers from Pamukkale University, Faculty of Education, the Primary School Teaching Program (1–5) in the Department of Elementary Education. The data were gathered through using a questionnaire including open-ended questions formed by the researchers. The gathered qualitative data were analyzed by employing content analysis technique. Findings were visualized through using figures.

Findings and Results: Findings reveal that prospective teachers prefer to use the Internet as their primary information source, which is followed by printed materials, living sources, and personal experience. Despite this, the majority of the participants are either uninformed of *Google* search information or are attempting to use casual methods of searching for

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information. Upon investigating the change based on participants' grade levels, it is seen that the teacher education process has created a very limited impact on prospective teachers' knowledge of *Google* commands. *Recommendations:* Findings show the need for teacher education programs to open courses on the Internet and for researchers to have a thorough investigation of prospective teachers' experiences with the Internet and search engines.

Keywords: Information technologies, search engine, teacher education, literacy

Can you imagine yourself driving in a metropolis with rudimentary or insufficient driving skills? How far can you go? Or how easily can you reach your destination? Though it is not as dangerous as the city traffic, the Internet has novice users surfing or searching. Those users might sometimes find what they are actually looking for. Yet, in many cases, they are likely to experience virtual accidents.

Students and prospective teachers often apply to the Internet to meet their need of information. The Internet is not just an information source for students but a source that researchers refer to in their academic inquiries (Kurbanoğlu, 2002). This circumstance not only indicates that the place of the Internet in our lives is getting deeper and deeper but also suggests that the needs of a person to be successful have drastically been changing. Parallel to those changes, the concept of literacy has expanded and yielded many new forms such as information literacy, technological literacy, media literacy, computer literacy, visual literacy, cultural literacy, and functional literacy. For instance, media literacy consists of four major components: locating, analyzing, evaluating, and producing information (Megee, 1997). Similarly, information literacy is reported to have three main constituents: locating, evaluating, and using information (Hector, 2005). As it is seen, one of the most basic items of all kinds of literacy is locating or accessing information.

With its most common meaning, "access" refers to the skills that are necessary to obtain and organize information (Hobbs, 1997). Accessing information consists not only of using different types of technologies (audio, visual, interactive, etc.) to receive information but also of being able to send messages (Megee, 1997). It has recently become necessary to acquire new skills to access information since the Internet sources are accumulating at a rattling rate. When it is thought that the pages indexed by the *Google* search engine are reported in billions (Zengin, 2009; Vine, 2004), the need to learn the skills to locate information becomes evident. Huerta and Sandoval-Almazán (2007), however, found that telecenter users in Mexico are digitally illiterate in navigating through a nonlinear environment to find desired information. It is also known that students often visit the Internet for their homework and projects (Akkoyunlu & Yılmaz, 2005; Kurbanoğlu, 2002). Similarly, Akdağ and Karahan (2004) found that university students use the Internet to obtain information on the subjects they search for and to follow newspaper/magazine news. Moreover, studies demonstrate that students prefer the Internet to libraries and other sources (Yalçınalp & Aşkar, 2003). This situation raises the question of whether prospective teachers have the basic skills to use search engines. In fact, search engine users need to use a

dozen of search commands to pinpoint the sources they need. Such technical information is called "system information" (Yalçınalp & Aşkar, 2003).

Search engines are built upon a *Boolean* model that supports formulization of the inquiry demand that uses the *AND*, *OR*, and *NOT* conjunctions (Sever, Akal & Köse, 2007). The term *Boolean*, which talks about the relationship between the search terms, comes from the Irish mathematician George Boole (Hector, 2005). When an inquiry is sent to a search engine that works in this model, as "*Internet AND education,*" the system will give the intersection classification of the terms *Internet* and *education*. In other words, if a document is available just in the intersection of A and B clusters, which means that it includes both of the terms, it will be brought (Sever *et al.*, 2007). When an "*Internet OR education*" inquiry is sent to the search engine, the system will not just yield the A and B intersections clusters but also will bring pages including either of the terms. If an inquiry such as "*mining AND NOT military*" is sent to the search engine, the pages involving the term *military* will be eliminated, while the other pages including the term *mining* will be brought. It is thus important to know a series of search commands and advanced search options to let users make shortcut searches that will yield the sought sources. Though limited, some previous studies touched upon the issue in one way or another.

Akdağ and Karahan (2004) found out that the people who have taken courses on the Internet prior to university education use the Internet more frequently than the ones who have not taken any courses. This result gives the impression that the users who have taken courses have more positive literacy skills than the others. Akkoyunlu and Yılmaz (2005) have analyzed prospective teachers' information literacy level, frequency of Internet usage, and aims in using the Internet. Their findings confirmed that the higher information literacy level the prospective teachers have, the more frequently they use the Internet to access information. These researchers have also stated that nearly all prospective teachers (99%) use the Internet to locate information and that they use it mostly for homework and projects (82%). In a study conducted to compare teachers and prospective teachers in terms of their self-efficacy beliefs for their information literacy skills, Usluel (2006) stated that both groups have high self-efficacy perceptions. However, when it comes to the sub-dimension of "the usage of communication and information technologies to locate information," both groups demonstrate lower perceptions than those in other sub-dimensions. This finding suggests that there are perhaps issues in terms of locating information for both groups. Previous studies also demonstrate that prospective teachers find the courses they have taken related to usage of Internet technologies inadequate or partly adequate (Karahan & İzci, 2001) and that they want to take courses to learn the use of search engines (Aldemir, 2004). Search engine users must be equipped with some knowledge of the subject in order to choose the right search terms (Land & Greene, 2000), and they must be familiar with the system in order to operate an engine effectively (Yalçınalp & Aşkar, 2003). However, in the studies that have been made so far, prospective teachers' proficiencies at using the search engines have been overly neglected. Thus, this study attempts to focus on the following research problems. (1) What are the primary sources that the prospective teachers

use to locate the information they need? (2) Do the prospective teachers have the necessary proficiencies to use search engines effectively? (3) How do the prospective teachers' proficiencies change depending on their year spent in the program?

Method

Research Context and Participants

This qualitative survey study has been carried out at Pamukkale University, Faculty of Education. The Faculty of Education currently has about 4,500 registered students and graduates nearly 1,000 teacher candidates each year. Among the graduates, about 350 are from the Primary School Teaching Program (1–5) in the Department of Elementary Education. Even though the university in which the study has been carried out has rich opportunities in terms of accessing information from national/international databases, it currently presents limited laboratory facilities for students' use. The population of the study consists of 1,340 prospective teachers registered at the Primary School Teaching Program in the Department of Elementary Education in the 2007–2008 academic year, 734 of whom attend a daytime program and 606 of whom attend an evening program. The size of the sample to represent the population—a minimum of 300 or above—was determined by using the ratio offered by Gay (1996, p. 125). There were five daytime and four evening groups in each grade level of the Primary School Teaching Program. From each grade level, one daytime and one evening group were selected randomly to participate in the study. This kind of selection is named "cluster sampling" (Karasar, 1991). From the groups that have been selected, 328 prospective teachers participated in this study. The participants' background characteristics are given in Table 1.

Table 1

Prospective Teachers' Distribution in terms of Personal Characteristics

	Gender		Program Type		Grade Level (Year in the Program)			
	Female	*Male*	*Daytime*	*Evening*	*I*	*II*	*III*	*IV*
	202	126	155	173	78	86	89	75
Total	328		328		328			

From Table 1, it is seen that 126 (38%) of the participants are male and 202 (62%) of them are female. These gender characteristics seem to be in line with Saban's (2003) findings obtained in a similar context and reflect a common cultural belief associating teaching with "women's work" (Hatch, 1999). Personal information characteristics also reveal that 155 (47%) participants are in a daytime program, and 173 (53%) of them are in an evening program. The characteristics of their grade level (year in the program) demonstrate that 78 (24%) participants are in the first year, 86 (26%) in the second year, 89 (27%) in the third year, and 75 (23%) in the fourth year.

Data Collection Instrument

The data have been collected by a questionnaire form consisting of three main sections. The first section of the questionnaire includes questions to gather the participants' personal information (gender, program type, and grade). Participants were asked to mark the appropriate answer for themselves among the given options. The second section includes an open-ended question to identify their choice of primary information sources. To this end, participants were asked the open-ended question "When you have to conduct a search on a topic (*e.g.*, for a project, presentation, or assignment), what is your primary resource to locate the information needed?" The participants were instructed to write their answer(s) in the given space. In the third section of the questionnaire, 10 problem statements were given to identify whether the participants possess proficiencies to use the *Google* search commands. Before constructing these problem statements, a pilot study was conducted on 60 prospective teachers in order to identify which search engine is used most frequently in their lives. It has been found that all of the participants use the *Google* search engine and that some of them use other search engines such as *Yahoo*, *Arabul,* and *Mynet* besides *Google.* After considering the additional facts that the *Google* search engine offers advanced search options and that its service is available in Turkish, it was thought that the study must be based upon the *Google* search engine.

Next, the researchers constructed 10 problem situations that require participants to use different *Google* commands. For example, the following problem situations were written, with (a) for a phrase search, (b) for a title search, and (c) for a file-type search.

a. "You are conducting a search on "class atmosphere" in teaching. It is important that the two words be side by side because the same words can bring other pages related to other subjects (for example, middle <u>class</u> and political <u>atmosphere</u>). Write how you would conduct a phrase search to bring the pages in which the two words are used consecutively."

b. "In a search you do about desertification, you want the keyword "desertification" to appear in the title of the page. Write how you would conduct a title search in order to find the pages you want."

c. "You are looking for a PowerPoint presentation about the subject of synergy. For this purpose you just want to find PowerPoint files (files with a ppt extension). Write how you would search for the files you need."

Under each question, space involving successive boxes was given. Participants were asked to write the search commands and terms in the given spaces, as if they were typing into the *Google* field, on condition that a character comes in each box. For the participants who might want to use advanced search options, a blank field was given below the boxes so that they could explain the steps they would follow.

In order to prove the structure validity of the questionnaire, expert ideas were taken. Based on the feedback taken from four experts, corrections were made in regard to structure, content, and language. Then a pilot study was conducted on a group of fifty students. The problems that were likely to occur during the

administration of the questionnaire were noted, and in the frame of the collected data no important changes were made on the questionnaire.

Data Collection Procedure

Data were collected in the fall semester of the 2007–2008 academic year. During the data collection procedure, the participants were informed of the condition that they would voluntarily participate in the study and that it is important to give their actual information or thoughts in order to ensure the validity and reliability of the results. They were also told that participating in the study will not affect their grades or graduation and that the data collected would not be given to any person or association. The questionnaire forms were handed out and administered by the researchers themselves in the classrooms.

Data Analysis

The SPSS package program was used to document the participants' personal information. Their background characteristics were presented by frequencies and percentages (Table 1). To identify the codes and themes standing out in the answers to the open-ended question in the second section of the questionnaire, "content analysis" technique was used. Content analysis can be defined as the isolation, counting, and interpretation of the concepts, problems, and subjects repeated in the collected data (Denzin & Lincoln, 1998; Miles & Huberman, 1994). Participants' answers about their primary source of information were transferred into the data sheet and analyzed by two of the researchers in terms of the categories they involve. The data were read, and codes were written on the sides of the pages. By analyzing the repeating codes, themes were formed (Stake, 1995). At the end of this process, four main themes were stated. For the reliability of the results, the third researcher reappointed all the data in the identified themes. The reliability of the study was determined by using the formula *Reliability = Agreement / (Agreement + disagreement)* (Gay, 1996; Miles & Huberman, 1994). This procedure yielded a satisfying rate of 96 percent agreement (Miles & Huberman, 1994). The disagreeing statements were re-evaluated under the integrity of the study, and the agreement rate was increased up to 100 percent. The frequencies of the emerging themes are presented in Figure 1.

Answers given to the problem situations in the third section of the questionnaire were analyzed and evaluated in terms of four different categories (uninformed or not knowing the answer at all→1; attempting to use casual ways→2; using an alternative way such as advanced search options→3; reaching the answer directly→4). Of the four categories, the first two show that the participants do not know the answer to the problem situation, and the last two demonstrate that the participants have the necessary knowledge to make the requested search. The data were coded by the first researcher at first, and then the second researcher independently rated the data. The Pearson interrater reliability between the two raters was found to be 0.88. The reliability code was raised above 0.95 by working on the coding differences. The findings were reported and illustrated by the actual statements of the participants. Direct quotations and illustrations give a clear image of the participants' thoughts and experiences (Yıldırım & Şimşek, 2005). At the end of each direct quotation, the questionnaire form number was presented in parentheses. The reported findings were also interpreted.

Findings and Interpretation

The results reported in this section are derived from the qualitative data obtained to answer each research question. Findings about each research question were presented respectively and interpreted. First, we present the preferred information sources.

Findings about the Preferred Information Sources

Analyzing the answers given to the question asked to understand prospective teachers' primary sources of information, the most repeating theme was found to be the Internet (61%). The second most repeating theme was found to be printed documents (35%). The third most repeating theme was people as the source of information (3%). This was followed by the experiences and observations of the person (1%), the least repeating theme (Figure 1). Some of the participants stated just one source, while the others wrote multiple sources to answer the given question. All the stated sources were taken into evaluation. Thus, the readers should not mix the frequency values and the percent values. For example, 307 of the participants stated the Internet as their primary source of information. This number meets 61 percent of the existing themes, not of the participants.
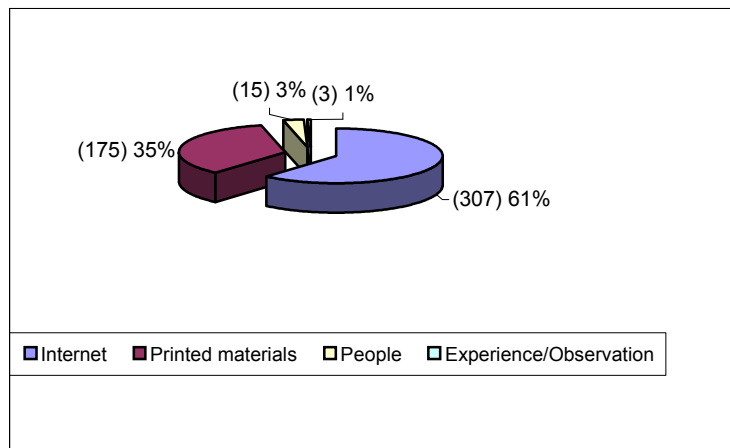

Figure 1. The frequencies and percentages of information sources for the participants

The findings reveal that the prospective teachers prefer the Internet to printed documents and other alternative information sources. This finding supports the sense that the prospective teachers prefer the Internet to libraries and other sources when facilities are offered (Yalçınalp & Aşkar, 2003). The main reason for this situation can be counted as the opportunity of accessing many documents from the Internet owing to the convergence between print and electronic sources. However, the findings in this respect make one wonder if the prospective teachers have the

necessary knowledge and skills to use search engines proficiently. For this reason, the second part of the study aims to display how well the participants can conduct searches using the *Google* search commands.

Prospective Teachers' Proficiencies at Using Google Commands

This part aims to answer the question "Do the prospective teachers have the necessary proficiencies to use search engines effectively?" There are 10 *Google* commands included. The main *Google* commands included in the study and their functions (see Sullivan, 2001) are presented in Table 2.

Table 2

Google Commands Needed for the Searches in the Given Problems and their Functions

(1)	AND + (plus)	Insists that the search engine include given keywords in the results. Example: **Internet AND education AND achievement** or instead **+Internet +education +success**
(2)	OR	Lists pages that have at least some of the keywords. Example: **teaching OR instruction**
(3)	AND NOT – (minus)	Insists that the search engine omits pages matching a given keyword in the search results. Example: **mining –military** or **mining AND NOT military**
(4)	"…"	Lists pages in which the keywords appear consecutively in a phrase. Example: **"class atmosphere"**
(5)	intitle	Restricts a search so that the keywords must appear in the title. Example: **intitle:desertification**
(6)	site (uk, tr, au...)	Searches the term just in the asked domain of the country. Example: **"Turkish people" AND site:uk**
(7)	site (edu, mil, com, gov...)	Searches the term just in the asked domain (*e.g.*, edu, com, gov.) Example: **nanotechnology AND site:edu**
(8)	filetype	Restricts a search to a given type of file (*e.g.*, doc, xls, ppt, pdf). For example: **Synergy AND filetype:ppt**
(9)	link	Lists pages that link to a particular page. Example: **link:www.yarisdersanesi.com**
(10)	inurl	Restricts a search so that keywords must appear in the page address. Example: **inurl:aliyesildere**

To be able to answer the second research question, the data were analyzed in terms of frequencies of four types of responses given to each search problem in the questionnaire. Then the results are presented visually (Figure 2). Findings reveal that most of the participants either are oblivious of the most common search commands or tend to search by using casual methods. Instead of using the *Google* commands, which are more likely to lead them to definite results, prospective teachers attempt to use casual methods that will mislead them to indirect routes or irrelevant sources. These kinds of approaches may turn the virtual environment into a maze, as Hector

(2005) states, and cause them to deal with many pages in an attempt to find what they are looking for (Huerta & Sandoval-Almazán, 2007).
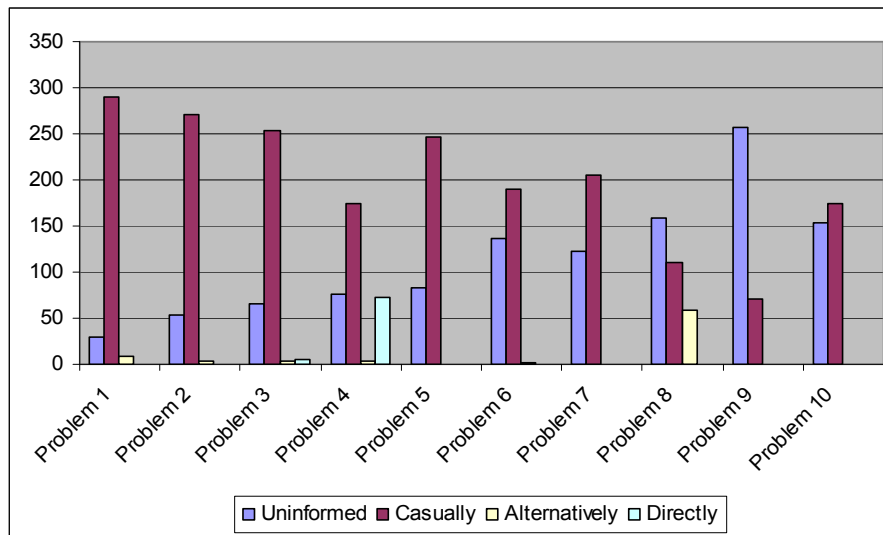

Figure II. The frequencies of the answers given to each question

Presenting some examples of what is meant by casual methods might be beneficial. To conduct a search requiring use of the "AND" conjunction with the key words of *computer, teaching,* and *achievement* (computer AND teaching AND achievement), the participants wrote *computer- teaching- achievement* (42), "*computer teaching achievement*" (120), "*computer, teaching, achievement*" (180), or *achievement with computerized teaching* (212). To conduct a title search about the topic of desertification (intitle:desertification), the participants wrote *desertification title* (253), *desertification title of the page* (287), *desertification in the titles* (303), or "*desertification*" (160). To search for a PowerPoint presentation in the subject of synergy (synergy filetype:ppt), the participants wrote *synergy presentation* (57), *presentation in the subject of synergy, power point presentation synergy* (93), *synergy(ppt)* (193), *presentation related to synergy* (178), or *synergy transparency presentation* (248). To perform a domain search in the education domain on the topic of nanotechnology (nanotechnology site:edu), the participants wrote *nanotechnology edu* (233), *nanotechnology in education* (299), *nanotechnology – edu* (251), or *nanotechnology in educational activities* (172).

The use of casual methods might perhaps be due to their insufficient knowledge of the virtual environment's structure and their unawareness of the search commands. Findings also uncover that most of the participants are not aware of the advanced search options. Only a small number of the participants stated that they would use the advanced search options to do the file type search. Another important finding is that 75 of the participants were able to do a phrase search directly. Other than those mentioned, the participants were not able to demonstrate direct moves to locate the information requested.

Change Depending on the Grade Level of the Participants

This part aims to answer the question "How do the prospective teachers' proficiencies change depending on their year in the program?" The frequencies of the answers given to questions from each grade level were documented. However, the number of people who participated in the study and the frequencies of the given answers should not be mixed. For example, the answers given to the first through the tenth problem situations were taken together for the 78 first-year prospective teachers, who were found to be using casual methods nearly 380 times for all questions. Or when the results from the 86 second-year participants were evaluated, it was seen that they altogether attempted to use casual methods nearly 600 times for all questions. The frequencies of the answers given to the problem situations are presented in Figure 3.
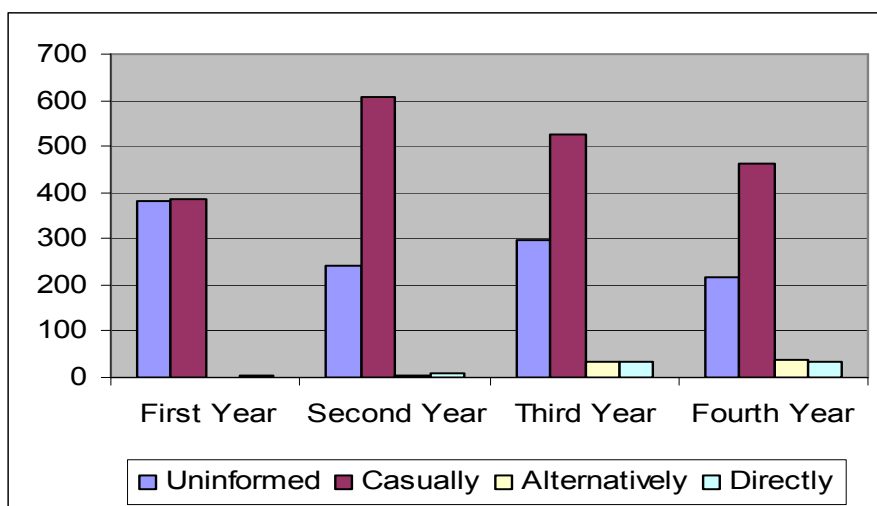

Figure 3. The frequencies of all the answers based on the grade levels

When Figure 3 is analyzed, it is seen that in all grade levels the majority of the prospective teachers appear to be uninformed of the *Google* search commands or tend to use casual methods in searching for information. It is, however, obvious from the findings that the knowledge of the participants seems to be changing positively as their grade level advances. Though it is not true for the first- and second-year prospective teachers, a limited number of those in the third and fourth years are able to locate the information alternatively or directly. It might then be said that prospective teachers become more proficient in locating information as their year in the program and thus experiences with information technologies rise.

Discussion

By using a Turkish urban university context, this study aimed to investigate prospective teachers' preferred information sources for their studies, their search proficiencies to use *Google* search engine, and how their proficiencies change as they approach graduation. The results of the study reveal that prospective teachers primarily tend to use the Internet and search engines in order to meet their need for information. This situation, which shows a great parallelism with earlier studies (*e.g.*, Yalçınalp & Aşkar, 2003), can be interpreted such that the prospective teachers promptly embrace new information technologies. This can also be taken positively for the future of the Turkish education system, since it will contribute to the integration of information technologies into curricula and thus to the transformation of curricula into technology-based ones.

In fact, the prospective teachers who are using these technologies for personal reasons to obtain information will better integrate them in teaching, learning, and curriculum design in the future. That is to say, they will be the ones who implement the technology revolution in schools. Upon evaluating their preferred information sources, however, one might get an impression that prospective teachers underestimate their own power, judgment, and observations in searching for information. In fact, the findings give a sense that the prospective teachers reflect an understanding in which the human factor and judgment fall behind the technology (Postman, 1993). The attitude to look down at their own role might invite the users to become consumers—consumers of information in particular. At this point, taking the concept of literacy as a whole with its other components and inviting the users to generate their own syntheses can make an important contribution to solve the discrepancy.

The findings give an impression that most of the prospective teachers do not possess the knowledge of *Google* search engine commands. It is perhaps due to their insufficient knowledge that they follow what is termed here as casual methods in their search. Taking into account that prospective teachers use the Internet to access information and most of them use the Internet for their homework and projects (Akkoyunlu & Yılmaz, 2005), it might then be concluded that there is an urgent need to introduce search engine commands to prospective teachers. Contrary to the findings in this study that they use the *Google* search engine with casual methods, previous studies (*e.g.*, Usluel, 2006) showed that prospective teachers' self-efficacy perceptions for information literacy are high in every aspect including locating information. There is, however, a detail in Usluel's study (2006) that has to be considered. It is that "the usage of communication and information technologies to locate information self-proficiency" dimension is lower than the other dimensions. This gives the impression that users are facing problems while searching for information. The finding demonstrating the dominant use of casual methods to locate information in our study overlaps with Usluel's (2006) findings. Taking into account that most of the students (90%) acquire information about the Internet by themselves (Börü, 2001) and that they want to take courses on the use of the Internet and search engines (Aldemir, 2004; Karahan & İzci, 2001), there is an urgent need to

introduce a profound literacy education in teacher education programs. Findings in this study pinpoint this need, as well. Based on the findings, it is difficult to claim that the prospective teachers learn how to use search engines proficiently in the teacher education programs. The finding that the prospective teachers at all levels comply with the casual methods in searching for information demonstrates a need for teacher education programs to include courses focusing on search engines, search strategies, the Internet, and important databases.

Teaching *Google* commands and other search skills to students and prospective teachers will undoubtedly help them to take advantage of technological advances. To be literate in this respect will bring many advantages for teachers and students. For instance, teachers and students might locate the information they target easily and swiftly. More importantly, achievements of people in a society depend, to a certain extent, upon how well they are equipped with various literacy skills, and information literacy skills in particular (Doyle, 1994; Ünlü, 2002). If teachers can teach search skills to their students at earlier ages, they can then positively influence the experiences of their students with the virtual environment. Otherwise, the experiences of the users, as Hector states (2005), might resemble an endless journey in a maze where they have no itinerary. It is also important to note that the nature of the Internet is convenient for this mess. The nature of the Internet environment is also convenient to reinforce the habit of having things handed to one on a silver platter. It must then be recognized that being literate not only covers accessing information but also includes analyzing the gained information and eventually synthesizing it to a new form (Megee, 1997). By synthesizing the gained information to a new form, students not only get away from being just the consumer of the information but also become the subjects who can produce information.

In conclusion, the study reveals that prospective teachers prefer the Internet to other information resources. Yet, the findings about their search skills show that they are unsatisfactorily equipped with search knowledge and skills to effectively use the *Google* search engine. Perhaps due to their inadequacy, most of the participants follow casual methods in searching for information. The results also give the impression that the teacher education process has a limited effect on their skills of accessing information by the *Google* search engine. The findings point out that in today's world, where media literacy is an integral part of the curricula at schools, teacher education programs must give a particular emphasis to the skills needed to locate information. Teaching the use of *Google* and other search engines will not only provide the prospective teachers with the ability to locate information proficiently but also make a positive contribution to the process of integrating technology with teaching activities. Unless the search skills are improved, users' experiences will not be different from the experiences of a novice driver in a metropolis. Future researchers might then focus on the subjective experiences of prospective teachers with the search engines and provide a thorough analysis of users' experiences.

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Sanal ortamda emeklemek: Öğretmen adaylarının *Google* arama motorunu kullanımları

(Özet)

Problem Durumu: İçinde bulunduğumuz yirmi birinci yüzyılda bilim ve teknolojide meydana gelen yenilik ve değişimlerin hızı baş döndürücü boyutlara ulaşmıştır. Bu gelişmelerle baş edebilmek ise, günümüz insanının temel ihtiyaçları arasında yer almaktadır. Günümüzde bilginin çokluğu, bilgiye erişimde önemli sorunları beraberinde getirmektedir. Bu sorunlar, bilgiye erişimde başarılı olan ve bu bilgileri etkili kullanarak yeni bilgiler üretebilen bireylere duyulan gereksinimi ortaya çıkarmaktadır. Bireyler hayatın vazgeçilmez bir parçası haline gelen internet ve arama motorlarına bilgi gereksinimlerini karşılamak amacıyla sıklıkla başvurmaktadırlar. Öğrencilerin ve öğretmen adaylarının da yaptıkları çalışmalarda sıklıkla arama motorlarından destek aldıkları bilinmektedir. Bu doğrultuda, gelecek nesilleri yetiştirecek olan öğretmen adaylarının, çağın özellikleri çerçevesinde donanımlı bireyler olmaları önem kazanmaktadır. Bu durum, içerisinde öğretmen adaylarının da yer aldığı internet kullanıcılarının, arama motorlarını etkili kullanabilmek için gerekli bilgi

ve becerilere sahip olup olmadıkları sorusunu akla getirmektedir. Oysa, literatür incelendiğinde konunun ihmal edildiği görülmektedir.

Araştırmanın Amacı: Bu çalışmanın amacı; öğretmen adaylarının başvurduğu öncelikli bilgi kaynaklarını saptamak, *Google* arama motorunu etkili kullanabilmek için gerekli yeterliğe sahip olup olmadıklarını ortaya çıkarmak ve öğretmen yetiştirme sürecinde mevcut yeterliklerinin nasıl bir değişime uğradığını saptamaktır.

Araştırmanın Yöntemi: Araştırmanın verileri nitel yollarla toplanmış ve çözümlenmiştir. Araştırmaya Pamukkale Üniversitesi Eğitim Fakültesi İlköğretim Bölümü Sınıf Öğretmenliği Anabilim Dalı'nda öğrenim gören 328 öğretmen adayı katılmıştır. Veriler, anket formuyla toplanmıştır. Anketin ilk bölümü, katılımcıların kişisel bilgilerini (cinsiyeti, program türü ve sınıfı) belirleme amacı taşıyan sorulardan oluşmaktadır. Anketin ikinci bölümünde ise öncelikle açık uçlu olarak katılımcılara bilgiye erişimde kullandıkları öncelikli yol sorulmuş ve verilen boşluğa sorunun kendileri için doğru olan cevabını yazmaları istenmiştir. Ardından, katılımcıların *Google* arama motorunu kullanabilmeleri için gerekli temel bilgi ve becerilere sahip olup olmadıklarını belirleme amacını taşıyan 10 problem durumu çerçevesinde sorular yöneltilmiştir. Bu sorular oluşturulmadan önce, yapılan bir ön çalışmayla 60 öğretmen adayına hangi arama motorlarını kullandıkları sorulmuş; öğretmen adaylarının tamamı *Google* arama motorunu kullandığı, ancak bazılarının *Google* ile birlikte diğer arama motorlarına (*Yahoo*, *Arabul*, *Mynet* vs.) da başvurdukları tespit edilmiştir. Bu sebeple, araştırmada *Google* arama motoru temele alınmıştır. Daha sonra, *Google* arama motorunu kullanabilmek için gerekli olan temel bilgi ve komutların her birini kullanmayı gerektiren 10 problem durumu yazılmıştır.

Katılımcıların kişisel bilgilerinin dökümünü alabilmek için SPSS paket programına başvurulmuştur. Veriler programa sırasıyla girilmiş ve katılımcıların kişisel bilgilerini belirlemeye yönelik sonuçlar; frekans analizi ve yüzdeler yardımıyla betimlenerek sunulmuştur. Anketin ikinci kısmında yer alan açık uçlu soruya verilen cevaplarda öne çıkan kod ve temaları tespit edebilmek için "içerik analizi" tekniğine başvurulmuştur. Katılımcıların, bilgiye erişimde kullandıkları öncelikli yol ile ilgili soruya verdikleri cevapları veri formuna aktarılmıştır. Veriler, araştırmacılardan ikisi tarafından, içerdiği kategoriler açısından çözümlenmiştir. Veri formuna aktarılan veriler okunarak anlamlı bölümler işaretlenmiş, sayfa kenarına kodlar yazılmıştır. Tekrar eden kodların, tümevarımcı yaklaşımla incelenmesiyle de temalar oluşturulmuştur. Bu süreç sonucunda dört temel tema tespit edilmiştir. Bu temalar; internet, basılı doküman, kaynak kişi, yaşantı/gözlem olarak belirlenmiştir.

Anketin ikinci kısmındaki problem ifadelerine verilen cevapların analizini yapabilmek için, cevaplar dört farklı kategoride (cevabı hiç bilmemek→1; cevaba gelişigüzel yollarla ulaşmaya çalışmak→2; sonuca ulaştıracak alternatif bir yol kullanmak→3; sonuca doğrudan ulaşmak→4) değerlendirilmiştir. Bu kategorilerden ilk ikisi istenilenin katılımcı tarafından bilinmediğini, diğer ikisi ise istenilen aramayı yapacak bilgiye katılımcının sahip olduğunu göstermektedir. Veriler, yukarıda bahsedilen kategoriler bağlamında önce birinci araştırmacı tarafından sonra da bağımsız olarak ikinci araştırmacı tarafından

kodlanmıştır. İki kodlamadan elde edilen puanlar arasındaki uyumun güvenirlik katsayısı (Pearson), SPSS paket programı aracılığıyla 0.88 olarak bulunmuştur. Kodlama farkları üzerinde çalışılarak görüş birliği sağlanan verilerin oranı artırılarak en son güvenirlik katsayısı 0.95 seviyesine çıkarılmıştır.

Bulgular ve Sonuçlar: Bulgular, öğretmen adaylarının interneti basılı dokümanlara ve diğer alternatif bilgi kaynaklarına tercih ettiklerini, diğer bilgi kaynaklarına göre daha öncelikli gördüklerini göstermektedir. Bu durumun başlıca sebepleri arasında, kütüphane kavramının sanal ortamla birleşmesi ve birçok basılı dokümana internet ortamından kolaylıkla ulaşabilme fırsatının olması sayılabilir. Ancak diğer bulgular, katılımcıların çoğunluğunun arama motoru komutlarını bilmediklerini; arama deneyimine yönelenlerin de çoğunluğunun her zaman kesin sonuca götürmeyen gelişigüzel yollar kullandıklarını göstermektedir. Adaylar belli bir aramayı doğrudan yaptıracak yolları kullanmak yerine dolaylı yoldan sonuca götürecek, belki de net sonuçlara götürmeyecek yolları denemektedirler. Öğretmen adaylarının bu gelişigüzel yollara başvurmalarının temel nedeni, sanal ortamın yapısı hakkındaki yetersiz bilgileri ve arama motoruna ait komutları bilmemeleri olabilir. Ayrıca bulgular katılımcıların gelişmiş arama seçeneklerini de bilmediklerini göstermektedir. Adayların sadece küçük bir kısmı, dosya türüne göre yapılan aramada gelişmiş arama yollarını kullanacaklarını ifade etmişlerdir. Ancak bu yollara, diğer sorularda yeterince adayın başvurduğu görülmemiştir. Dikkate değer bir bulgu da, sadece cümlecik (phrase) araştırmasında yaklaşık yetmiş beş adayın doğrudan sonuca götüren hamleler yapabilmiş olmasıdır. Bunun dışındaki soruların çoğunda adaylar doğrudan sonuca götürecek hamleler yapamamışlardır.

Araştırmadaki bulgular, öğretmen adaylarının *Google* arama motoru kullanımına yönelik yeterliklerinin sınıflar düzeyinde de ağırlıklı olarak "bilmeme" ve gelişigüzel yollar kullanma" şeklinde olduğunu göstermektedir. Ancak sözü edilen bu bilgi ve becerilerin sınıf düzeyi ilerledikçe daha olumlu bir yöne doğru değiştiği görülmektedir. Birinci ve ikinci sınıftaki öğretmen adayları için geçerli olmasa da, üçüncü ve dördüncü sınıftaki sınırlı sayıdaki adayın alternatif veya doğrudan yollarla bilgiye ulaştıkları görülmektedir. O halde öğrenim düzeyi ilerledikçe, öğrencilerin artan deneyimlerine bağlı olarak, bilgiye arama motorları aracılığıyla daha kolay ulaştıkları söylenebilir.

Öneriler: Elde edilen sonuçlar, medya okuryazarlığının okullarda ders olarak okutulduğu günümüzde, erişim becerilerine öğretmen yetiştirme programlarında özel bir önem verilmesi ve öğretmen adaylarının arama motorlarıyla olan öznel deneyimlerinin derinlemesine araştırılması gereksinimini işaret etmektedir. *Google* ve diğer arama motorlarının komut ve kullanımlarının öğretilmesi, hem öğretmen adaylarının gelişigüzel yollar yerine doğrudan sonuca giden yolları kullanmalarını sağlayacak hem de eğitim programlarının gelecekte teknolojiyle bütünleşme sürecine olumlu katkı yapacaktır.

Anahtar Sözcükler: Bilgi teknolojileri, arama motoru, öğretmen yetiştirme, okuryazarlık