Examination of Preservice Teachers' Lifelong Learning Trends by Online Information Searching Strategies

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ABSTRACT

This study aimed to examine the relationship between the lifelong learning trends of preservice teachers and the online information searching strategies used by them. Accordingly, this is a quantitative study using the correlational research design. The study group was composed of 317 preservice teachers studied at Sakarya University. The Lifelong Learning Trends Scale and the Online Information Searching Strategy Inventory were utilized. It was concluded in the study that there was a statistically significant relationship among Lifelong Learning Trends Scale and all factors of the Online Information Searching Strategy Inventory. The stepwise regression model which was created to determine to what extend all the online information searching strategies predict lifelong learning trends was statistically significant. It was observed that preservice teachers' lifelong learning trends were statistically and significantly predicted by problem-solving strategies in the first place which were followed by disorientation strategies and purposeful thinking strategies, respectively.

Keywords: *Lifelong learning; teaching/learning strategies; computer-mediated communication.*

INTRODUCTION

Throughout the history, the answer to the question of what is human is sought. This question is addressed from both the scientific and philosophical dimensions, and more emphasis is placed on the structures of human researching (Thales), questioning (Socrates), social (Plato), thinking (Aristotle), debating (Hearklites), experimenting (John Locke) and criticizing (Kant). Today, the existence of all these structures is accepted and the development of all of them is important. Therefore this development, has lasted a lifetime, has become an indisputable fact. In this context, emerging "Lifelong learning(LLL)" can be considered as an indicator of development of the individual. 21st century, development is inconceivable independent of technology. With such an information network expanding so rapidly, technology will enable individuals to achieve LLL (Edwards, 1993).

Humankind's curiosity of information searching for centuries has brought about the emergence of several information throughout the history. Each new information has been pioneering the emergence of the next information and enabling science and technology to advance. Rapid development and expansion of computers and Internet especially in recent years have eliminated the problem of time and space, taking the Internet to the front ranks among information sources (Leu, 1997; Duffy, 2000; Van Laer & Van Aelst, 2010; Ay ve Seferoğlu, 2017). Internet has now become a practical source of information which is constantly consulted (Duffy, 2000). Becoming learning instruments, information sources accessed via Internet and technology have allowed people learn anywhere and anytime, which has provided customized and personal

learning processes (Allen, Seaman, Poulin & Straut, 2016; Ekici ve Özenç-Uçak, 2012; Edwards, 1993). Today, individuals can easily access various elements such as digital libraries, virtual museums, product and service catalogs, public or personal websites involving official information, and databases of electronic books, journals and newspapers where online searches can be performed and reach information about themselves without even going to the space where the given information and document are supplied (DiMaggio, Hargittai, Neuman & Robinson, 2001; Olcay, 2003; Livingstone, 2005; Brey, 2006; Kurulgan ve Argan, 2007). Due to rapid reproduction of information on the web and accessibility and editability of information by everyone in recent times, Internet has become the primary information source (Brey, 2006; Aşkar & Mazman, 2013). In the light of this information, the contribution of using technology to LLL tendency cannot be denied.

LLL includes skills of willingness to learn and openness to development and these skills can be acquired later. Therefore, it is possible to increase the LLL tendency of the individual through education provided in schools. This situation increases the duties and responsibilities of teachers and preservice teachers about raising lifelong learners. It is expected that teachers and preservice teachers who will educate information literate individuals will be lifelong learners in terms of being a role model for future generations. In this respect, it is necessary to focus on the development of teachers and preservice teachers as professional lifelong learners (Ingleby, Joyce & Powell, 2011: 6; Graven, 2012: 127; Gür-Erdogan, 2014). For preservice teachers to become lifelong learners, it is important to have online information searching strategies(OISS) that is thought to have a positive effect on this tendency. At this point, the concepts of LLL and OISS which are important for the clarity of the study are detailed.

Lifelong Learning (LLL)

Concept of LLL is described as the capacity to overcome changing situations flexibly and the ability to combine theory and practice to achieve learning along one's career and the things to be achieved (Bligh, 1982). As stated in a Memorandum on Lifelong Learning, "Concept of LLL covers all purposive learning activities either formal or common, natural, constantly continuing which are performed to improve knowledge, skills and abilities within the framework of personal, social and/or professional life" (SEC, 2000). LLL is a natural tendency to learn, grow and improve, and this tendency is a process that can be achieved by eliminating negative and insecure thought and belief systems and exploring the learning tendencies (McCombs, 1991). In this sense, LLL is considered important in the encouragement of individual's special performance and competencies and abilities required for the improvement of general abilities in activities, tasks and roles (De La Harpe & Radloff, 2000; Boud, 2007; Aspin, Chapman, Evans & Bagnal, 2012). LLL brings about the willingness to learn and openness to development as a prerequisite. The willingness to learn during the LLL process is that individuals engage in learning activities in order to contribute to their professional and personal development beyond their formal educational activities. Especially in the individuals who graduated from 21st century universities, teamwork, commitment, oral communication skills, self- motivation, written communication skills, cooperation, self-management, and problem- solving ability attributes are also expected besides willingness to learn (Adler & Milne, 1997). In addition, the willingness to learn was expressed by Candy (1991) in the basic competences that should be found in individuals with LLL as a love of learning (cit. Bath & Smith, 2009). Openness to development, described in the features that should be in a successful society (Robertson, 2018), is to keep up with the latest technological changes and innovations that will increase the individual's own experience and performance and is open to self-improvement through these changes. Individuals trying new techniques and ideas and trying to learn more about their professions show that individuals are open to development (Owen, 2014). In this context, determination of the individual's willingness to learn and openness to development, collection of measurements enables to determine the LLL tendencies (Field, 2001; Author, 2014).

For LLL, individuals need to have some competencies (Ponton, 1999; Knapper and Cropley, 2000; Knapper, 2006;Duffy, 2003 cit. Atik-Kara & Kürüm, 2007; Figel, 2007; Heinrich, 2007 cit. Heinrich, Bhattacharya & Rayudu, 2007; Candy, 1991 cit. Bath & Smith, 2009; Association for Education in Africa (ADEA), 2012). Some of these competences are; targeting, finding information, self-management and self-assessment, adaptation of learning strategies (learning to learn), integration, applying knowledge and skills (critical thinking, analysis, synthesis, deep learning), evaluation of the application, problem solving,

assertiveness, information and technology literacy (Knapper, 2006; Heinrich, 2007: 654 cit. Heinrich, Bhattacharya & Rayudu, 2007) etc. .

A series of skills which requires having the ability to know when there is a need for information, to be able to find, evaluate and effectively use the information can be described as information literacy, and information literacy is what underlies LLL (ALA, 2000). As for competencies required in individuals for LLL, it is observed that information literacy is highly emphasized (Knapper & Cropley, 2000; Duffy, 2003 cit. Atik-Kara & Kürüm, 2007; Heinrich, 2007: 654 cit. Heinrich, Bhattacharya & Rayudu, 2007; Candy, 1991 cit. Bath & Smith, 2009; ADEA, 2012) and information literacy is basically recognized as the ability to investigate, evaluate and manage information. An individual who is an information literate knows how to learn and achieve LLL (Kurbanoğlu, 2003). Hence, importance of information literacy has been frequently shaped within the framework of LLL (Kapitzke, 2003).

Introduced with the emergence of information technologies in the beginning of 1970s, the idea of information literacy started to be recognized as critical literacy for the 21st century, shaped and gained strength (Bruce, 2004). Individuals who are able to carry out high level problem solving processes, have a broad knowledge of access to information resources, manage and evaluate technological systems and use the necessary strategies in this direction (Bruce and Candy, 1994 cit. Orr and Edwards, 1996) can be expressed as information literate individuals. An information literate individual is aware that accurate and sufficient information is the basis for decision making, recognizes the need for information, formulates questions based on knowledge requirements, determines the potential sources of information, develops a successful searching strategy, accesses information sources using computers and other technologies, evaluates the information, organizes information for use in practice, combines new knowledge within the existing knowledge structure, uses knowledge in critical thinking and problem solving (Doyle, 1994: 2-3).

Gaining importance among a rapidly growing stack of information, the concept of information literacy has a very broad coverage, which involves information technology skills, as well (Barnard, Nash, & O'Brien, 2005). Internet becoming widespread as the widest database of this information is also great importance for information literacy. Today, Internet is featured to be the first information searching method that comes to mind. It is easy to find information on Internet; however, it may be very difficult to find accurate information within reasonable time (Harrison, 2009). Because using Internet, which is an open environment, to search for information is a hard and complicated process (Debowski, 2001). Searching and processing information, one of the skills that should be in an information literate individual, is a complex cognitive process that requires students to validate, evaluate, organize and integrate information from a variety of sources (Mason & Boldrin, 2008; Walraven, Brand-gruwel & Boshuizen, 2008 cit. Tseng, Liang & Tsai, 2014).

Nowadays, using Internet information successfully requires learners to ask the right questions, search for answers from the right sources, evaluate the information obtained from these sources, and quickly find the target information. Successful use of Internet information requires skills that help learners find targeted information in a fast manner (Tseng, Liang & Tsai, 2014). Thus, it is an important matter how learners will learn to search for information and create strategy so that they can exactly use Internet as a tool of information searching and learning (Ekici & Özenç-Uçak, 2012). In this context, the most important aim of teaching the information literacy in schools is to enable learners to be educated and encouraged to search information, to get the right information, to analyze, to use and to evaluate the information (Marshall, 2006). In this direction, to acquire these skills, learners' and teachers' ,to train learners, OISS should be developed.

Online Information Searching Strategies (OISS)

With the development of Internet and prevalent usage of web media, web has become the most important source of information. Web has turned into a technology that can be used actively by in every walk of life and a virtual platform in which users can add contents and which enables access to more information with more sources and in a more rapid and easy manner. When people need any information on any subject, they do a search in web sources in the first place. On this virtual platform, the stack of information is expanding day by day, and it is becoming harder and harder for individuals to reach accurate and reliable information and analyze it. Disorientation is also possible in web. Disorientation in web is a common problem

experienced by individuals that can be defined as losing one's sense of location in web and digressing when doing a search (Ahuja & Webster, 2001; Juvina & Van Oostendorp, 2006; Webster & Ahuja, 2006). Individuals who get lost when doing a search in web find it difficult to create a cognitive model of the structure of information (Gwizdka & Spence, 2007). In this context, they need to activate cognitive and meta-cognitive strategies for managing the processes of reaching accurate and reliable information, analyzing and decision making well without getting lost.

Cognitive strategies are defined as a mental process created for achieving top-level cognitive objectives such as problem solving while meta-cognitive strategies are a process which allows individuals to monitor and evaluate their ongoing performances for delivering a cognitive task (Dole, Nokes & Drits, 2009). Online information search which is regarded as a complex cognitive process involving multi-dimensional cognitive and metacognitive strategies (Hill, 1999; Tsai & Tsai, 2003; Tsai, 2009) comprises of social, communicational and interactive behaviors (Fourie, 2006; Ikoja-Odongo & Mostert, 2006). From this point of view, OISS need to be significantly used by individuals for them to use this complex cognitive process by individuals when doing a search in web. Otherwise, individuals may get lost and cannot access accurate and reliable information when doing a search in web. Accordingly, cognitive strategies need to be used for information search in online environments.

Tsai and Tsai (2003) suggested a three-dimensional framework to analyze information searching strategies in online web media. In this scope, OISS were divided into three domains: behavioral, procedural and metacognitive domains (Tsai, 2009). Cognitive domain covers the basic navigation and manipulation skills on Internet, which involve strategies of control and losing one's direction-disorientation. Procedural domain is about general content searching approaches on Internet, which involve trial & error, and problem-solving strategies on Internet. Finally, metacognitive domain refers to top-level skills and content-related cognitive activity skills on Internet, which involve strategies of purposeful thinking, select the main idea and evaluation (Tsai & Tsai, 2003). In these three main domains, there are seven basic aspects used for online information search: control aspect involving the manipulation skills required when doing a search on Internet, disorientation aspect involving the awareness of how to do the search on Internet, trial and error aspect allowing for doing search in different forms, problem solving aspect referring to the skills and responsibility of coping with problems or disappointments experienced as a result of the search, purposeful thinking aspect involving the skill required for self-monitoring during the search, select main ideas aspect involving the skills required for defining the key concepts of information searched on Internet, and evaluation aspect involving the judgment and organization of the information acquired on Internet (Tsai, 2009).

With OISS introduced by Tsai and Tsai (2003) within a cognitive and metacognitive framework, many variables have been addressed to conduct studies in the related literature and OISS have been investigated in an effort. In the studies performed in the literature, gender (Ay & Seferoğlu, 2017; Turan, Reisoğlu, Özçelik & Göktaş, 2015), parental Internet attitude (Uysal, Çakıroğlu & Horzum, 2017), information searching frequency, information searching level (Sırakaya & Çakır, 2014), Internet usage level (Turan, Reisoğlu, Özçelik & Göktaş, 2015), epistemological beliefs (Hsu, Tsai, Hou & Tsai, 2014; Tu, Shih & Tsai, 2008; Çevik, 2015; Mason, Ariasi & Boldrin, 2011), self-regulative learning (Tseng, Liang & Tsai, 2014), prior domain knowledge (Sanchiz, Chin, Chevalier, Fu, Amadieu & He, 2017), web experience (Tu, Shih & Tsai, 2008; Çevik, 2015), and motivation (Çevik, 2015) are some of the addressed variables.

Tu, Shih and Tsai (2008) found in their study with eighth-grade students that the students who had metacognitive skills such as keyword refinement achieved more successful search results while the students with more advanced epistemological beliefs reached more diverse and sound search results. Tsai, Liang, Hou and Tsai (2012) determined that OISS used by university students to search for daily life information were better than the strategies used by them in learning activities especially in behavioral and metacognitive strategies.

Hsu, Tsai, Hou and Tsai (2014) found that the students with more sophisticated scientific epistemological beliefs tended to use more advanced OISS and exhibit higher levels of metacognitive searching patterns. In addition, Çevik (2015) explored that individuals' OISS were predicted by their epistemological beliefs, decision-making styles, web search experiences and objective orientations. In that

study, the students with more advanced epistemological beliefs, more web search experiences, higher objective orientation levels and rational decision-making styles were more likely to use higher-level OISS.

Tseng, Liang and Tsai (2014) conducted a study to identify a relationship between OISS, self-regulative learning and online information evaluation standards and stated that OISS were positively predicted by self-regulative learning skills and online information regulation standards. Moreover, Çoklar, Yaman and Yurdakul (2017) addressed information literacy and whether being a digital native as the determinant of online information searching strategies. They concluded that OISS had a high correlation with information literacy and low correlation with whether being a digital native.

In terms of gaining information literacy to individuals, it is considered important to teach OISS in schools. Because the acquisition of information literacy skills will enable them both to conduct the researches and assignments given in the teaching process in a successful and orderly way and to make individuals become lifelong learners in the post-teaching process (Kıyıcı, 2008). A learner who has developed OISS, becomes an individual with access to information literacy in terms of reaching accurate and reliable information sources. This also provides a rationale that supports LLL.

When the studies are examined, it is seen that OISS are related with self-regulation, self-learning and information literacy skills. Individuals need to possess self-regulative, self-learning and information literacy skills in terms of learning, and these skills are the ones required also for LLL. How self-regulative skills and information literacy skills expected in lifelong learners were found to be positively predicting OISS indicates the possibility of a relationship between OISS and LLL, and OISS could be also a predictor of LLL. In this context, it can be said that OISS are indirectly related to LLL through information literacy.

The problem-solving strategy from 7 key strategies used to search for online information is also a LLL qualification (Engel, 1991; Williams & Williams, 1997; Duffy, 2003 cit. Atik-Kara & Kürüm; Hmelo-Silver, 2004; Heinrich, 2007 cit. Heinrich, Bhattacharya & Rayudu, 2007). In this context, there are studies showing that there is a direct relationship between problem solving and LLL (Dolmans, De Grave, Wolfhagen & Van Der Vleuten, 2005; Boud & Feletti, 1997 cit. Savery, 2015; Loyens, Magda & Rikers, 2008). Furthermore, Baylor (2001) found that there was a direct and negative relationship between disorientation, which is one of the strategies of online search for information, and information literacy, which is one of the LLL competences (Candy, 1991 cit. Bath & Smith, 2009; Figel, 2007; Fain, 2011; ADEA, 2012). This proves that there is an indirect relationship between disorientation and LLL. The purposeful thinking strategy, another OISS, is directly associated with critical thinking (Duffy, 2003 cit. Atik-Kara & Kürüm; Knapper, 2006; Heinrich, 2007: 654 cit. Heinrich, Bhattacharya & Rayudu, 2007), one of the lifelong learning competences (Paul & Elder, 2006 cit. Lai, 2011). This shows that there is an indirect relationship between purposeful thinking and LLL. In addition to purposeful thinking and problem solving strategies, evaluation, trial & error, select main ideas and control strategies, which are OISS, is directly related to self-regulated which is one of the LLL capabilities (Knapper & Cropley, 2000; Lüftenegger et al., 2015: 2) is the study conducted by Tseng, Luang & Tsai (2014). In addition, evaluation, trial & error, select main ideas and control strategies, which are one of the OISS, are directly related to self-regulated (Tseng, Liang & Tsai, 2014), which is one of the LLL competences (Knapper & Cropley, 2000; Lüftenegger et al., 2015: 2).

In the light of this information, it is seen that OISS are effective in the LLL trends of learners. In line with the expectations of the society, it is expected that teachers, who have a significant share in educating lifelong learners, are lifelong learners. Therefore, LLL in teacher competences is emphasized (Eurydice, 2008; Gordon, Halász, Krawczyk, Leney, Michel, Pepper,... & Wiśniewski, 2009). In particular the report of Common European Principles for Teacher Competencies and Qualifications emphasizes teacher education programs to be prepared within the scope of LLL (cit. Cornu, 2006). Strategies to increase the LLL trends of teacher candidates are considered important in teacher training programs (Coolahan, 2002; Cornu, 2006). Studies that emphasize the importance of lifelong learning tendencies of teachers and preservice teachers (Fenwick, 2001; Ho & Yip2003; Law, Lee ve Yen, 2009; Donnison, 2009; Arsal, 2011; Meerah, Lian, Osman, Zakaria, Iksan ve Soh , 2011; Biesta, 2012; Finsterwald, Wagner, Schober, Lüftenegger ve Spiel 2013; Garipağaoğlu, 2013; Çelebi ve diğerleri, 2014; Klug, Krause, Schober, Finsterwald ve Spiel, 2014; Akyol, 2016; Cetin, & Cetin, 2017; Jones, & McLean, 2018; Khabeishvili, 2018; Yilmaz, 2018), and the importance of having teacher and

preservice teachers' OISS (Tsai, & Tsai, 2003; Lenell, 2006; Hwang, Tsai, Tsai & Tseng, 2008; Laverty, Reed & Lee, 2008; Tsai, Tsai, & Hwang, 2011; Leu, McVerry, O'Byrne, Kiili, Zawilinski, Everett-Cacopardo, ... & Forzani, 2011; Sırakaya & Çakır, 2014; Çevik, 2015; Turan, Reisoğlu, Özçelik & Göktaş, 2015; Yılmaz & Çakmak, 2016; Tarunasena, Rusman, & Darmawan, 2018; Gökçearslan, & Bayır, 2018) are available in the literature.

In this context, it can be said that gaining knowledge of online information search is important for LLL tendency. Because when the literature is examined, there are direct and indirect relations between the 7 basic strategies in OISS and LLL. However, there are no studies showing which strategies of LLL trends are more affected and predicted. However, it is considered important to determine which of the 7 main strategies is more predictive of LLL in order to strengthen this tendency of the teachers who will gain LLL skills.

Purpose of the Study

The main problem of this study is; "How are the lifelong learning trends of preservice teachers predicted by the aspects of online information searching strategies?". This study aimed to investigate the relationship between LLL trends of preservice teachers and their OISS and whether LLL trends are predicted by all aspects of OISS. Moreover, in this study, it has been tried to determine which OISS is the best predictor of LLL trends.

RESEARCH METHOD

Research Model

This study aimed to examine the relationship between the LLL trends of preservice teachers and the OISS used by them. Accordingly, this is a quantitative study using the correlational research design. Correlational research designs are used for identifying the relationship between two or more variables and the level of relationship and for predicting the possible outcomes of these relationships (Creswell, 2012; Fraenkel, Wallen, & Hyun, 2012).

Participants

The participants were composed of 317 preservice teachers studying at Sakarya University. All of the preservice teachers are experienced in searching online information under ICT Course. Participants also all have at least one semester teaching experience. Distribution of participants by age, gender and teaching experience is presented in Table 1.

Table 1. Frequency and Percentage Distribution of Participant Preservice Teachers by Age and Gender

		Number	Percentage
Gender	Female	185	58.4
	Male	132	41.6
Age	19	24	7.6
	20	54	17.0
	21	81	25.6
	22	75	23.7
	23	50	15.8
	24	33	10.4
Teaching Experince	1 semester	203	64
	2 semesters	114	36
Total		317	100

According to Table 1, 185 (58.4%) of the participants are female and 132 (41.6%) of them are male. Their age varied between 19 and 24, and 24 (7.6%) participants were 19 years old, 54 (17%) of them were 20 years old, 81 (25.6%) of them were 21 years old, 75 (23.7%) of them were 22 years old, 50 (15.8%) of them were 23 years old, and 33 (10.4%) of them were 24 years old. All participants have teaching experiences. Two hundred three participants (64%) had one semester and 114 participants (36%) had two semesters of experience.

Data Collection Instruments

The Lifelong Learning Trends Scale developed by Author (2016) and the Online Information Searching Strategy Inventory developed by Tsai (2009) and adapted by Aşkar and Mazman (2013) were utilized for the data collection.

Lifelong Learning Trends Scale: The "Lifelong Learning Trends Scale" was developed by Author (2016) and is composed of 17 items and the factors of 'willingness to learn' and 'openness to development'. The Cronbach's alpha internal consistency coefficient, which was calculated for the reliability of the scale was .82 for the factor of openness to development, .82 for the factor of willingness to learn and .86 for all scale. All 17 items in the scale provide information on the LLL trend of the individual. Therefore, the total score is determined and the LLL trend of the individual is determined. The sample item in the dimension of willingness to learn in scale; "I don't give up trying to learn even if learning is difficult", , the sample item in the dimension of openness to improvement; "I enjoy learning new things". The lowest score which can be obtained is 17 and the highest one is 85 in the 5-point Likert-type scale. Higher scores mean increased LLL trend. Cronbach's Alpha internal consistency was calculated to be .86 for the reliability in the scale development study.

Online Information Searching Strategy Inventory: Developed by Tsai (2009), the 6-point Likert-type scale was adapted into Turkish language by Aşkar and Mazman (2013) and consists of 25 items. The factor analysis showed that the adapted scale is composed of 7 factors ("disorientation", "evaluation", "purposeful thinking", "select main ideas", "trial & error", "control" and "problem solving") as the original scale does. The confirmatory factor analysis performed during the scale adaptation study showed that these factors show good fit. For the reliability of the scale, the calculated Cronbach Alpha coefficient for disorientation factor is .625, for the evaluation factor is .762, for the purposeful thinking factor .765, for the factor of discriminating basic ideas .771 and .612 for the problem solving factor and .910 for the whole scale. Each factor included in the scale is as follows; disorientation: "I always feel nervous when I search information of the Internet."; evaluation: "I decide if the information provided in a website is worth for reference." ; purposeful thinking: "I keep on reminding myself of the purpose for searching online." ; trial and error: "I try other databases when I cannot get any information in one database." ; select main ideas: "I usually think about what keywords I can use in advance."; control: "I know how to use a web browser, like IE or Netscape." ; problem solving: "I do my best to resolve any problem occurred during a searching.".

Data Analysis

The data obtained in the research were subjected to the pearson correlation analysis for examining the relationship between LLL trends and OISS. Multiple linear regression analysis was utilized to see whether LLL trends were predicted by all factors of OISS. Furthermore, stepwise regression analysis was performed to identify the OISS which is the best predictor of LLL trends. SPSS 24 software package was used for the analyses.

FINDINGS

The relationship between 317 participant preservice teachers' LLL trends and OISS was examined with the simple correlation analysis. Table 2 contains the descriptive statistics of the variables whose relationship is examined.

Table 2. Descriptive Statistics of LLLT and OISS

	$\bar{X}$	SS	Skewness	Kurtosis
Lifelong learning trends (LLLT)	70.01	7.48	-.502	.920
1. Disorientation	11.05	5.34	.489	-.630
2. Evaluation	17.63	3.96	-.287	-.429
3. Purposeful thinking	17.78	4.14	-.421	-.309
4. Trial & error	13.86	3.35	-.632	-.111
5. Select main ideas	13.91	3.37	-.730	.209
6. Control	18.16	4.28	-.625	-.067
7. Problem Solving	11.98	3.48	-.590	.511

When the values in Table 2 were examined, it was seen that all variables were normally distrubited. Correlation values of LLL trends and variables of OISS factors are given in Table 3.

Table 3. Correlation Coefficients between LLLT and OISS

	LLLT	1	2	3	4	5	6	7
Lifelong learning trends (LLLT)								
Predictive Variables								
1. Disorientation	-.521**							
2. Evaluation	.408**	-.306**						
3. Purposeful thinking	.431**	-.350**	.607**					
4. Trial & error	.387**	-.363**	.565**	.550**				
5. Select main ideas	.419**	-.391**	.612**	.632**	.571**			
6. Control	.336**	-.359**	.643**	.574**	.610**	.628**		
7. Problem solving	.548**	-.364**	.487**	.444**	.437**	.456**	.351**	

**p<0.01

According to Table 3, it was observed that there was a statistically significant relationship between LLL trends and all factors of OISS. LLL trends were found to be medium negatively correlated to disorientation (r=-.521; p<0.01) and medium positively correlated to evaluation (r=.408; p<0.01), purposeful thinking (r=.431; p<0.01), trial & error (r=.387; p<0.01), select main ideas (r=.419; p<0.01), control (r=.336; p<0.01), and problem-solving (r=.548; p<0.01) factors of OISS. The highest level of relationship was found between LLL trends and problem-solving factor of OISS. It was followed by disorientation, purposeful thinking, select main ideas, evaluation, trial & error and control strategies.

Multiple linear regression analysis was utilized to see whether LLL trends were predicted by all factors of OISS. Significant correlations between independent variables and dependent variable and relationships among independent variables not being above 0.80 mean that a regression analysis can be performed with these variables (Büyüköztürk, 2006). Variance Inflation Factor (VIF), Tolerance Value and Condition Index (CI) were examined to control the multicollinearity assumption which is a main assumption of the multiple regression analysis. The achieved results are given in Table 4.

Table 4. Coefficient Table for the Multicollinearity Assumption

	Variance Inflation Factor (VIF)	Tolerance Value	Condition Index (CI)
Constant			1.000
Disorientation	1.140	.877	5,670
Evaluation	2,618	.382	12.401
Purposeful thinking	2.372	.422	16.881
Trial & error	1.922	.520	18.830
Select main ideas	2.217	.451	19.631
Control	2.239	.447	19.714
Problem solving	1.464	.683	24.209

It is expected that Variance Inflation Factor (VIF) is lower than 10, Tolerance value is higher than 0.10, Condition Index (CI) is lower than 30 (Hair, Black, Babin, Anderson & Tatham, 2006; Tabachnick, Fidell, & Osterlind, 2001; Author, 2013). Considering all these limits, it was observed that there was no multicollinearity problem in the dataset used in the study and the data were suitable for multiple linear regression analysis.

To determine to what extent preservice teachers' LLL trends were predicted by "disorientation, evaluation, purposeful thinking, trial & error, select main ideas, control and problem solving" strategies of OISS, predictive variables' effect on LLL trends were examined with the stepwise regression technique. In consideration of the size of relationship between the factors of OISS and LLL trends, the predictive variables were added to the model, and the results are shown in Table 5.

Table 5. Prediction of LLLT by OISS

Model	Predictive Variables	B	Standard Error	β	t
1	Constant	55.905	1.263		44.277**
	Problem Solving	1.177	.101	.548	11.637**
		R=.548	R2=.301	F=135.420	p=.000
2	Constant	64.912	1.476		43.976**
	Problem Solving	.948	.093	.441	10.200**
	Disorientation	-.566	.061	-.405	-9.350**
		R= .673	R2= .453	F=130.001	p=.000
3	Constant	60.834	1.821		33.411**
	Problem Solving	.799	.100	.372	8.020**
	Disorientation	-.532	.060	-.380	-8.855**
	Purposeful Thinking	.308	.084	.171	3.690**
		R= .690	R2=.476	F=94.690	p=.000
4	Constant	60,234	1.916		31.444**
	Problem Solving	.775	.102	.361	7.580**
	Disorientation	-.523	.061	-.374	-8.629**
	Purposeful Thinking	.256	.098	.142	2.611*
	Select main ideas	.123	.122	.056	1.009*
		R=.691	R2=.477	F=71.276	p=.000
5	Constant	59,969	1.947		30.798**
	Problem Solving	.758	.105	.353	7.227**
	Disorientation	-.525	.061	-.376	-8.649**
	Purposeful Thinking	.213	.113	.118	1.893*
	Select main ideas	.098	.126	.044	1.780*

	Evaluation	.091	.118	.048	1.773*
		R= .692	R2=.478	F=57.067	p=.000
6	Constant	59.728	2.003		29.819**
	Problem Solving	.750	.106	.349	7.081**
	Disorientation	-.523	.061	-.374	-8.560**
	Purposeful Thinking	.205	.114	.114	1.872*
	Select main ideas	.082	.130	.037	1.731*
	Evaluation	.079	.120	.042	1.660*
	Trial & error	.063	.121	.028	1.523*
		R=.692	R2=.479	F=47.490	p=.000
7	Constant	59.934	2.036		29.444**
	Problem Solving	.744	.107	.347	6.979**
	Disorientation	-.525	.061	-.376	-8.570**
	Purposeful Thinking	.209	.114	.116	1.828*
	Select main ideas	.103	.135	.047	1.614*
	Evaluation	.101	.125	.053	1.602*
	Trial & error	.085	.127	.038	1.641*
	Control	-.063	.107	-.036	-1.506*
		R= .692	R2=.480	F=40.669	p=.000

Dependent Variable: Lifelong learning trends, *p<0.05; **p<0.01

According to Table 5, the regression model created for determining to what extent LLL trends were predicted by all of the OISS is statistically significant [F=40.669, p<0.01]. The stepwise regression analysis results show that 7 steps were included in the multiple regression analysis. The predictive variable of problem solving which was processed in the first step of the regression analysis could explain 30% of the total variance regarding the LLL trends (R=0.55, R^2=.30). The disorientation variable was added in the second step of the stepwise regression analysis. Accordingly, variables of problem solving and disorientation could explain 45% of the LLL trends (R=0.67, R^2=0.45). So, it can be said that the disorientation variable made a contribution of 15% to the model. With other variables remaining as constants, Beta coefficients of the variables of problem solving and disorientation were calculated to be 0.44 and -0.41, respectively. T values were found to be statistically significant for both variables (t=10.20, t=-9.35, respectively; p<.01).

The variable of purposeful thinking was added besides problem solving and disorientation in the third step of the stepwise regression analysis. Problem solving, disorientation and purposeful thinking variables together could explain 47.6% of the total variance regarding the LLL trends (R=0.69, R^2=0.476). Accordingly, it is possible to say that purposeful thinking provided an increase of 2.6% in the regression equation. The Beta coefficients were calculated to be 0.372 for problem solving, -0.380 for disorientation and 0.171 for purposeful thinking in this step. T values were found to be statistically significant for all three variables (t=8.020, t=-8.855, t= 3.690, respectively; p<.0.01).

The variable of select main ideas was added besides problem solving, disorientation, and purposeful thinking in the fourth step of the stepwise regression analysis. Variables of problem solving, disorientation, purposeful thinking and select main ideas together could explain 47.7% of the total variance regarding the LLL trends (R=0.691, R^2=0.477). Accordingly, it is possible to say that select main ideas provided an increase of 0.1% in the regression equation. In this step, the Beta coefficients were calculated to be 0.361 for problem solving, -0.374 for disorientation, 0.142 for purposeful thinking and 0.056 for select main ideas. T values were found to be statistically significant for all four variables (t=7.580, t=-8.62; p<0.01, t=2.611, t= 1.009; p<.0.05 respectively).

The variable of evaluation was added besides problem solving, disorientation, purposeful thinking, and select main ideas in the fifth step of the stepwise regression analysis. Variables of problem solving, disorientation, purposeful thinking, select main ideas and evaluation together could explain 47.8% of the total variance regarding the LLL trends (R=0.692, R^2=0.478). It is possible to say that evaluation made a contribution of 2.6% to the regression equation. The Beta coefficients were calculated to be 0.353 for problem solving, -0.376 for disorientation, 0.118 for purposeful thinking, 0.044 for select main ideas, and 0.048 for evaluation in this step. T values were found to be statistically significant for all five variables (t=7.227, t=-8.649; p<0.01, t=1.893, t= 1.780, t= 1.773; p<.0.05 respectively).

The variable of trial & error was added besides problem solving, disorientation, purposeful thinking, select main ideas, and evaluation in the sixth step of the stepwise regression analysis. Variables of problem solving, disorientation, purposeful thinking, select main ideas, evaluation and trial & error together could explain 47.9% of the total variance regarding the LLL trends (R=0.692, R^2=0.479). It is possible to say that trial & error made a contribution of 0.1% to the regression equation. The Beta coefficients were calculated to be 0.349 for problem solving, -0.374 for disorientation, 0.114 for purposeful thinking, 0.037 for select main ideas, 0.042 for evaluation, and 0.028 for trial & error in this step. T values were found to be statistically significant for all six variables (t=7.081, t=-8.560; p<0.01, t=1.872, t= 1.731, t=1.660, t= 1.523; p<0.05 respectively).

In the last step of the stepwise regression analysis, all factors of OISS were included in the model. All factors could explain 48% of the total variance regarding LLL trends (R=0.692, R^2=0.480). It can be accordingly said that the control variable added in the last step provided an increase of 0.1% in the regression equation. The Beta coefficients were calculated to be 0.347 for problem solving, -0.376 for disorientation, 0.116 for purposeful thinking, 0.047 for select main ideas, 0.053 for evaluation, 0.038 for trial & error, and -0.036 for control in this step. T values were found to be statistically significant for all variables (t=6.979, t=-8.570; p<0.01, t=1.828, t= 1.614, t=1.602, t= 1.641, t=-1.506; p<0.05 respectively).

Considering both Beta and R^2 values of problem solving, disorientation and purposeful thinking, select main ideas, evaluation, trial & error and control variables, it was observed that preservice teachers' LLL trends were statistically and significantly predicted by problem-solving strategies in the first place which were followed by disorientation strategies and purposeful thinking strategies, respectively. It was seen that select main ideas, evaluation, trial & error and control variables significantly predicted the LLL trends but had low effect values. The following is the regression equation regarding the prediction of preservice teachers' LLL trends according to the multiple regression analysis results:

Lifelong Learning Trends = 59.934 + 0.744*(Problem Solving) − 0.525*(Disorientation) + 0.209*(Purposeful Thinking) + 0.103*(Select Main Ideas) + 0.101*(Evaluation) + 0.085*(Trial & Error) - 0.063 *(Control)

CONCLUSION

The results of the study indicated that there was a statistically significant relationship between LLL trends and all factors of OISS. While LLL trends were found medium negatively correlated to disorientation strategy of OISS but medium positively correlated to evaluation, purposeful thinking, trial & error, select main ideas, control and problem-solving strategies of OISS. Moreover the findings showed that LLL trends were statistically and significantly predicted by problem-solving strategies in the first place which were followed by disorientation strategies and purposeful thinking strategies, respectively. Then, these strategies should be brought to learners through programs for raising lifelong learners.

DISCUSSION

The ability to define the skills that users should have in web environments is among the studies that have gained importance today (Burnett & McKinley, 1998 ; Zins, 2000). Sönmez and Gül (2014) emphasize that in order to solve the digital problems faced by individuals in digital age, they should have digital literacy cognitive skills, mainly information literacy. Information literacy is considered to be an important skill for LLL (Fain 2011), and there is also the ability to access accurate information without being lost within the knowledge literacy skills.

Disorientation generally occurring when one does not know how to begin searching for information and what to do while searching on Internet also refers to the lack of self-learning efficacy, which is reversely related to LLL. Yet, how individuals using the strategies of purposeful thinking, trial & error, select main ideas, control and problem solving can acquire and use certain information and conclude the accuracy of information and scrutinize and distinguish information indicates that they are information literate individuals while being the indicator of their LLL trends (Association of College and Research Libraries, 2002 cit: Hesieh & Tsai, 2014). The fact that the disorientation strategy in this study was inversely associated with LLL was supported by the finding in the study by Baylor (2001) that the disorientation was negatively correlated with learning.

There are skills that individuals need to have on the basis of LLL. One of these skills is problem solving skill (Engel, 1991; Williams & Williams, 1997; Hmelo-Silver, 2004). It has been found out that students develop a flexible understanding in learning based on problem solving skills (Hmelo-Silver, 2004). The same results support by other studies (Dolmans, De Grave, Wolfhagen & Van Der Vleuten, 2005; Boud & Feletti, 1997 cit. Savery, 2015; Loyens, Magda & Rikers, 2008). In this context, it is expected that problem-solving skills from OISS will have a positive relationship with LLL tendency.

Purposeful thinking skills are among metacognitive skills (Tsai, 2009). Moreover purposeful thinking includes both creativity and critical thinking (Paul & Elder, 2006 cit. Lai, 2011). Critical thinking is considered to be an important skill of LLL (Kreber, 1998). In this context, it is expected that LLL is predicted by purposeful thinking.

Individuals with OISS (disorientation, evaluation, purposeful thinking, trial & error, select main ideas, control, problem solving) are self-learning individuals who have advanced self-regulation skills in terms of obtaining information, using them, convincing about the accuracy of information and distinguishing and analyzing information. In related literature(Winters, Greene, & Costich, 2008; Wu & Tsai, 2005) noted that "self-regulated learning (SRL) was found to be influential in online learning". In addition in the study by Tseng, Liang and Tsai (2014), it was found that; students' basic SRL guided their cognitive domain OISS (i.e., behavioural and procedural searching strategies) while their advanced SRL guided their metacognitive OISS. Self-regulation skills also emerge indirectly as an indicator of LLL trends. LLL is defined as a competence specific to the field that requires learning, motivation and self-regulated learning throughout the person's life (Lüftenegger et al., 2015:2).

When the studies related to OISS are examined, it is seen that similar findings are seen as the results of the study. Sırakaya and Çakır (2014) concluded that the teachers had problem-solving strategies on a medium level and suggested that the level of these strategies can be increased above the medium level as they are important to self-learner individuals. This can be achieved by including them in the programs of raising preservice teachers. Purposeful thinking strategies, which is a high level OISS and predicts LLL trends significantly, are in the metacognitive domain, and metacognitive domain skills that are considered among the most critical skills (Uysal, Çakıroğlu & Horzum, 2017) reinforce the consideration that these OISS are

included in the educational programs. Moreover, Turan, Reisoğlu, Özçelik and Göktaş, (2015) stated that the experience of experienced and inexperienced teachers in terms of OISS has shown a significant difference in to purposeful thinking strategies. In this context taking the purposeful thinking strategies into account in teacher education and curricula would be useful for teachers' development and quality of the learning outputs of students. In the end, due to extraordinary size and ever-changing information structure of Internet, individuals are required to have self-regulation and self-learning and information literacy skills so that they can prespecify their needs for information search to achieve successful information searching processes (Tabatabai & Shore, 2005), and these skills are also needed for LLL.

Özdamlı and Özdal (2014) found in their study that self-efficacy levels of the teachers for LLL trends were medium positively correlated to their information and communication technology skills. In this context, it is consistent with the relationship between preservice teachers' OISS and LLL trends.

Knowledge and skills need to be updated in order to become a teacher with a high level of knowledge and a high level of LLL skills who are professionally equipped with the effects of rapid development and impact of technology (Beşoluk and Horzum, 2011). Especially with technological developments, professional development is provided by online environments. In this context, it is important that preservice teachers are able to use online environments and develop OISS in order to continue their professional development after they become teachers and to improve themselves.

Recommendations

In line with the results obtained in this study, it may be suggested that enriching the program to be used in the training of lifelong learners and to include OISS especially in problem solving, disorentiation and purposeful thinking strategies, in the curriculum. These programs can also be given to teachers online via online training. As a result of this study, studies can be done to identify and improve the activities that will increase the problem solving, dissorentiation and purposeful thinking with the most effect. These activities can be used to increase LLL trends.

In the light of this study, it is thought that the experimental studies aimed at the application of OISS and increasing LLL trends will contribute to the literature. Other factors affecting LLL trends can be explored, these factors can be identified and the framework of factors affecting LLL trends can be clarified.

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