International Journal of Progressive Education, Volume 17 Number 1, 2021

Online Information Search Competencies of Prospective Philosophy Teachers in an Online Pedagogical Formation Program

Güler Tuluk [i]
Kastamonu University

Halil İbrahim Akyüz [ii]
Kastamonu University

Abstract

This study aims to examine the knowledge-seeking competencies of prospective philosophy teachers who have received pedagogical training in an online environment according to their "reflective thoughts" and "Inventory of Online Information Search Strategies". The methodology of the study was the single-group pretest-posttest pattern, which is one of the weak experimental designs. The data were obtained from 49 prospective teachers. The results of the study indicated that the online training program created significant differences in all other sub-factors, except reflective thinking habit and understanding sub-factors, and overall total score according to both reflective thinking and online information search strategies. Prospective teachers have entered the process of deep thinking about teaching, evaluating their own experiences and making sense of them; that is, the process of deep thinking caused the change in conceptual perspectives. They gained the skill of evaluating themselves from a different perspective. Prospective teachers have also mentioned that they know the strategies for searching information on the Internet, they can use the evaluation and problem-solving strategies, they can select and compare the information available on the Internet, they can select and compare programs, they can interpret the information and programs that they find, and develop new ways according to their results, shows that they can transform them according to their fields.

Keywords: Pedagogical Formation Education, Online Information Search Strategy, Reflective Thinking

DOI: 10.29329/ijpe.2020.329.4

---

[i] **Güler Tuluk,** Assoc. Prof. Dr., Mathematics and Science Education, Kastamonu University, Education Faculty, ORCID: 0000-0002-3665-6699

[ii] **Halil İbrahim Akyüz,** Assist. Prof. Dr., Ceit, Kastamonu University, ORCID: 0000-0002-1614-3271

Correspondence: hakyuz@kastamonu.edu.tr

INTRODUCTION

An important feature of the 21st century in terms of education is to access information from multiple environments and evaluate this information, to share and discuss with others without recognizing time and place limits and to use this information in real life when necessary is (Kurubacak and Wiburg, 2002). Internet is at the top of the way to access information. Internet perception of students shapes their attitudes and online behaviours (Tsai & Lin, 2004). Online learning environments provide more flexibility for students' learning-activity arrangements. It is part of the process that students make and control decisions about learning activities in terms of speed, depth and scope, media type. It is also possible to see the time spent on education here. Another contribution is student control. The conditions for students to be in this environment have also changed.

By adapting the concepts of educational institutions to the century in a fast way, significant changes are seen in the domains of learning and teaching. Although many e-learning theories have developed until today, e-learning practices in Turkey were not very common before the covid-19 outbreak. However, many universities have now moved on to complementary web-based courses. Online lessons offer students convenience (Poole, 2000), flexibility (Chizmar&Walbert, 1999) and opportunities to work closely with teachers and other students from different schools and even different schools. Studies are examining the effect of technical skills, including computers and the Internet on students' performance in Web-based learning environments (Peng, Tsai & Wu, 2006).

In addition to the appropriate skills and attitudes related to the Internet, non-teacher-centred online learning environments enable students to take a more active role in their learning. Being active in learning environments has become an imperative for students. Especially today's learning environments, students develop self-regulation skills (Hartley & Bendixen, 2001; Hsu & Shiue, 2005), manage time (Hill, 2002; Roper, 2007), continue working with the class and complete work in time (Discenza, Howard and Schenk (2002), actively participating in education (Garrison, Cleveland-Innes and Fung, 2004). There are integrated systems developed to realize this door of life. These systems are generally called Learning Management Systems (LMS, ÖYS).

The Learning Management System (LMS) is the internet-based software used to conduct training management processes such as assigning e-learning training to employees, getting employees to training, monitoring the results, and reporting the results. These are systems based on Internet technologies in order to provide collaborative work, the most known of which are Moodle ©, Atutor ©, Blackboard ©, etc.

Moodle is the most preferred Learning Management System in the open-source world. Moodle is a PHP based open-source online education system with MySQL support. Lessons are set up in modules. It supports Linux, Unix, Windows and Mac OS X operating systems. The trial version and help system are available on the Internet instantly. It is used with GPL license and is managed with portal logic. It provides SSL, TSL support and is a straightforward system for people who have portal management since plugins are installed as modules (Elmas et al., 2008). It is also evident that pre-service teachers should be able to use such a system comfortably in the size they want. Especially after this covid-19 epidemic that covers the world, the importance of such platforms has increased, and teachers are expected to carry out tasks such as managing these platforms, creating lessons, activities, and defining their students without help. Prospective teachers who do not use such virtual environments as students are not expected to acquire this skill. One of the important lessons expected to gain skills such as managing these environments and developing materials for these environments is "Instructional Technologies and Material Development".

In Turkey, teacher competencies (ÖYGEM, 2017), technological pedagogical content knowledge, technology knowledge are discussed in the ninth indicator of "Managing the Teaching and Learning Process" competence in the field of "professional Skill" competence. Koehler and Mishra (2006) pointed out that the interaction of content, pedagogy and technology elements should have a

dynamic structure. They stated that teachers should properly integrate technology and pedagogy with the curriculum they use in their learning-teaching environments.

A valuable definition of reflection comes from John Dewey (1933) 'How We Think'. Dewey defined reflection as "active, permanent and careful consideration of any form of belief or so-called information in the light of the reasons supporting it and more forward-looking results" (p. 9).

Teaching Practice is a course prepared for pre-service teachers to apply and experience the knowledge, skills and behaviors they have acquired during their undergraduate studies in the school environment and gain the features required by their profession (YÖK, 1998). In the Teaching Practice course, prospective teachers are expected to develop the competencies of the teaching profession, to be able to understand the curriculum of their field (Http: //www.müfredat.meb.gov.tr) and to be aware of the curriculum of other fields. Ability to use textbooks and equipment (http://www.eba.gov.tr/, https://daym.meb.gov.tr), to evaluate and develop additional teaching materials when necessary (online web pages), measurement - Assessment (https://odsgm.meb.gov.tr/, http://www.eba.gov.tr/#/anasayfa) is also expected. Besides, it is expected that they will improve their work by sharing their work in these courses with the school practice teacher, the course teaching staff and, if necessary, with other practice friends.

Researches in Turkiye use technology related to reflective thinking; such as blogs (Bayrak, 2010), using blogs (Ünver, 2003; Korkmazgil, 2009) and digital documentary production (Urhan&Erdem, 2018). Since web-based environments are accessible and editable by everyone, they become the primary source of information in almost every area. Today, teaching is going in a different direction due to the covid-19 outbreak, and the web environment is becoming more and more available to access all kinds of information. Cognitive learning theories bring cognitive and metacognitive strategies (Tsai & Tsai, 2003) to the agenda, just like problem-solving skills. In this context, searching for information on the Web is not only technical but also an intellectual skill.

Online learning programs are on the agenda as this covid-19 was used during the epidemic period. In these environments, many situations such as self-directed learning, ability to use computer / Internet, problem-solving, student control and online communication skills have been faced. To date, many researchers have explained that students have difficulty in choosing the information they are looking for in these environments and deciding whether the information they find is worth using (Lorenzen, 2002; Walraven, Brand-Gruwel, and Boshhuizen, 2009, Cited. Aşkar and Mazman, 2013). In this context, online information search strategies developed are the subject of this research. This study aims to examine the knowledge-seeking competencies of prospective philosophy teachers who have received an online pedagogical training.

Research Problems

In this context, the questions of the research:

1. How does the experimental process affect the Online Information Search strategy competencies of prospective philosophy teachers?

2. What is the effect of the Experimental Process on Reflective Thinking Trends?

METHOD

Research Design

In this research, "single-group pretest-posttest" pattern, which is one of the weak experimental designs, was used. With this pattern, the effect of the experimental process is tested by working on a

single group. Measurements of the dependent variable are measured within the scope of the pretest and posttest after the application. In order to evaluate the effect of the application, the difference between the two measurements is examined (Büyüköztürk, KılıçÇakmak, Akgün, Karadeniz and Demirel, 2014). According to the single group pretest-posttest model, it can be seen as an advantage to be able to determine the student levels based on pretesting. In this way, at least there is an opportunity to observe whether there is any change in the dependent variable or the result (Nachmias&Nachmias, 1997; Karasar, 2005). The change in the independent variable related to this method may result from the measurement error, rather than the experimental process (Campbell & Stanley, 1963).

The "Use of Web 2.0 tools for educational purposes" activities prepared for prospective teachers continued for 12 weeks, and the opportunity for the group to apply these activities for four weeks in their schools and then online during the lecturing phase continued for the group. They experienced matching, multiple-choice, quiz exams (ders.kasefuk.org) and these exams related to the topics that are explained every two weeks within the group. Also, educational content and Web 2.0 tools concept cartoon (powtoon), flow chart preparation (smartdraw), concept and mind mapping (inspiration, coogle, cmap), poster editing (ronyasoft poster designer), exam preparation (kahoot.it), preparing puzzle, students' worksheet preparation (Word or other programs), presentation preparation (powerpoint) continued online in editing. The evaluation of the weekly studies has been carried out over the Internet. Besides, EBA is not open to candidates who have received pedagogical training. However, in order to use this environment by the participants, the environment was discussed and reviewed online with the students. This environment for philosophy lessons should be examined by both candidates and students at school, and opinions should be taken. Also, in this online environment, students engage in discussions every week in the field of conversations and forums, content teaching, and the use of technology in the field. They had the opportunity to communicate simultaneously and asynchronously with the lecturer on the site.

Working Group

This research consists of 49 prospective teachers who have enrolled in the "Instructional Technologies and Material Development" course, which is continuing the pedagogical formation program of 2019-2020 at the education faculty of a university in Northwest Anatolia, and has voluntarily responded the pretest and posttests.

Data Collection Tools

In the research, "Reflective Thinking Scale", which was developed by Kember et al. (2000) and adapted to Turkish culture, was used to determine the reflective thinking levels of prospective teachers about their profession. The scale consists of four factors and 16 items: "habit", "comprehension", "reflection", "critical reflection". Internal consistency coefficients for each subscale are 0.54 for habit subscale, 0.66 for comprehension subscale, 0.80 for reflection subscale, and 0.72 for critical reflection subscale (Çiğdem, Kurt, 2012).

"Online information search strategies inventory" developed by Tsai (2009) and adapted to Turkish by Aşkar and Mazman (2913) was used to measure students' online information search strategies. Seven factors ("disorientation", "evaluation", "purposeful thinking", " select main ideas", "trial and error", "control" and "problem solving") and the reliability coefficient of the inventory consisting of 25 items (Cronbach alpha) Is 0.91 (Aşkar and Mazman, 2013).

FINDINGS

Findings of Reflective Thinking Sub-dimension

In the reflective thinking scale habit sub-dimension, pretest and posttest data were presented in the following tables. It was determined that the data showed normal distribution in terms of both graphical methods and statistical methods (SWpre = 975 p> 0.5; SWpost =, 975 p> 0.5). Paired t-test results are given in the table below.

Reflective Thinking: Habitual Sub-dimension	Mean	N	StandardDeviation	t	sd	p
Pre-test	10,204	49	3,2402	-1,999	48	,51
Post-test	11,102		3,6012			

When the table above is analyzed, the pretest score mean of the Habitual subscale has increased from 10,204 to 11,102 after the application. According to the paired t-test result, it was found that the 0.889 point increase between the pretest means score and the posttest mean score was not significant (t = -1.999; p> 0.05). In other words, in this sub-dimension, no significant difference was found between the pretest test mean scores and posttest mean scores. The experimental process did not make a significant contribution to the scores of learners in this sub-dimension.

The distribution of pretest and posttest scores in the understanding, reflection, critical reflection sub-factors of reflective thinking scale were examined. It was determined that the distributions did not provide normality assumptions which are paired t-test assumptions. Therefore, in these sub-factors, Wilcoxon signed row number analysis was performed.

The results of Wilcoxon signed-rank test are presented in the table below on the significance of the difference between the pretest and posttest scores in the comprehension, reflection, critical reflection sub-factors and general scores of the reflective thinking scale.

Reflective Thinking Sub-dimension		N	Rank Mean	Sum of Rank	Z	p
Understanding	Negative Rank	10[a]	22,20	222,00	-2,737	0,006
	Pozitive rank	31[b]	20,61	639,00		
	Equal	8[c]				
Reflection	Negative Rank	9[a]	22,22	200,00	-3,014	0,003
	Positive Rank	32[b]	20,66	661,00		
	Equal	8[c]				
Critical Reflection	Negative Rank	14[a]	18,96	265,50	-2,865	0,004
	Positive Rank	31[b]	24,82	769,50		
	Equal	4[c]				
QRT (General)	Negative Rank	15[a]	19,63	294,50	-2,690	0,007
	Positive Rank	31[b]	25,37	786,50		
	Equal	3[c]				

[a]Post Test <Pre test; [b]Post Test > Pre Test; [c]PostTest = Post Test

When the table above is analyzed, it is seen that the negative rank mean is 22,20 and the positive rank mean is 20,61. As a result of the Wilcoxon signed row numbers, it was determined that row means were statistically significant (Z = -2.737; p <, 05). It is seen that there is a difference in favour of pretesting in the understanding sub-dimension.

According to the results of Wilcoxon signed-rank numbers, the negative rank mean was 22.22 and the positive rank means 20.66, and the difference between rank means was statistically significant (Z = -3.014; p <, 05). When the table is analyzed, it is seen that 32 students increased their posttest scores. A decrease in the scores of 9 students in the posttest reflection sub-dimension was observed. When looking at the mean of the rank, a negative decrease in this sub-dimension can be mentioned.

According to the results of Wilcoxon signed-rank numbers, the negative rank mean was 18.96 and the positive rank mean was 24.82 and the difference between rank means was statistically significant (Z = -2,865; p <, 05). It can be said that the posttest is more successful than the pretest.

According to the table above, the negative rank mean was 19.63, and the positive rank means 25.37. There is a statistically significant difference between the pretest and posttest scores according to the results of the Wilcoxon signed-rank numbers (Z = -2,690; p <, 05). In other words, the pretest scores of students are higher than the posttest scores. It has been observed that the implementation has a significant effect on students' reflective thinking levels. It has developed the reflective thinking level of students.

Findings for Online Information Search Strategies

Whether the data obtained from the information search strategies scale provides normality distribution was examined with graphical and statistical methods in all sub-factors, and it was observed that the pretest and posttest data did not normally distribute in all sub-factors and in total. Due to the absence of the normality assumption, which is the underlying assumption of parametric tests, it was decided to carry out wilxocon sign tests from all non-parametric tests in all sub-factors.

Online Knowledge Search Strategy Scale Wilcoxon signed-rank test results are given in the table below regarding the significance of the difference between pretest and posttest scores regarding disorientation, evaluation, purposeful thinking, trial and error, select main ideas, control, and problems sub-factors and overall total scores.

Sub-dimension		N	Rank Mean	Sum of Rank	z	p
disorientation	Negative Rank	12[a]	19,04	228,50	-2,447	0,014
	Positive Rank	28[b]	21,13	591,50		
	Equal	9[c]				
evaluation	Negative Rank	10[a]	14,04	140,00	-3,637	,000
	Positive Rank	30[b]	22,67	690,00		
	Equal	9[c]				
purposeful thinking	Negative Rank	10[a]	12,30	123,00	-3,593	,000
	Positive Rank	28[b]	22,07	618,00		
	Equal	11[c]				
trial and error	Negative Rank	11[a]	16,27	179,00	-3,271	,001
	Positive Rank	30[b]	22,73	682,00		
	Equal	8[c]				
select main ideas	Negative Rank	6[a]	20,42	122,50	-3,162	,002
	Positive Rank	29[b]	17,50	507,50		
	Equal	14[c]				
Control	Negative Rank	7[a]	16,29	114,00	-3,988	,000
	Positive Rank	33[b]	21,39	706,00		
	Equal	9[c]				
Problem	Negative Rank	10[a]	14,20	142,00	-3,167	,002
	Positive Rank	27[b]	20,78	561,00		
	Equal	12[c]				
OISI(General)	Negative Rank	11[a]	18,64	205,00	-3,929	,000
	Positive Rank	37[b]	26,24	971,00		
	Equal	1[c]				

[a]Post Test <Pre test; [b]Post Test > Pre Test; [c]PostTest = Post Test

When the table is analyzed, it is seen that there is a significant difference between the pretest and posttest scores of the students participating in the study from the online information searching strategy disorientation subscale (z = -2,447, p <, 05). Considering the rank average and totals of the difference scores, it is seen that the observed difference is in favor of positive ranks, that is, the posttest score. According to these results, it can be said that the experimental study has an important effect on the disorientation sub-dimension.

According to the table above, there is a significant difference between the pretest and posttest scores in the evaluation sub-dimension (z = -3,637, p <, 05). Posttest scores were found to be significantly higher than pretest scores. In other words, it has been determined that the experimental process has a significant effect on the online information searching strategy evaluation sub-dimension.

According to the table, it was determined that there was a significant difference between pretest scores and posttest scores, according to Wilcoxon, signed-rank number analysis (z = -3,593, p <, 05). Considering the rank average and totals of the difference scores, it is seen that the observed difference is in favor of positive ranks, that is, the posttest score. According to these results, it can be said that the experimental study has a significant effect on the purposeful thinking sub-dimension of the Online Information searching strategy.

In the table, a significant difference was found between the pretest and posttest scores in the trial and error sub-dimension (z = -3,593, p <, 05). When the rank average and totals of the difference scores are examined, it is seen that there is a significant difference in favor of the posttest. In other words, posttest scores are significantly higher than pretest scores. It can be said that the experimental process has an important effect on the trial and error sub-dimension of the Online Information searching strategy.

According to the table, there is a significant difference between the pretest and posttest scores in the dimension of select main ideas (z = -3,162, p <, 05). It was seen that the difference was in favor of the posttest. It has been determined that the experimental process has an important effect on the Online Information searching strategy in select main ideas.

In the table, a significant difference was found between the pretest and posttest scores in the online information searching strategies scale control sub-dimension (z = -3,988, p <, 05). When the average and sum of the difference scores are examined, it is seen that the difference is in favor of the posttest. Accordingly, it can be said that the experimental process caused a significant effect on the control sub-dimension.

In the table, a significant difference was found between the pretest and posttest scores in the problem-solving sub-dimension of the online information searching strategies scale (z = -3,167, p <, 05). When the average and sum of the difference scores are examined, it is seen that the difference is in favor of the posttest. Accordingly, it can be said that the experimental process caused a significant effect on the problem-solving sub-dimension.

Lastly, it was seen from the table that the participants got a significant difference from the Online information searching strategies scale in the pretest and posttests in favor of the posttest (z = -392, p <, 05). The participants' posttest scores were found to be significantly higher than the pretest scores. It can be said that the experimental study has a significant difference in all sub-factors and overall total score in favor of the posttest and has increased the scores obtained.

RESULTS

In this section, firstly the results of the reflective thinking factors and then the results of the online information searching strategies factors are given.

Reflective Thinking Results

The sub-factor habitual is considered conditioned behavior that occurs as a result of the fact that it always occurs in the same way as internal and external influences. These behaviors that the person uses in maintaining his daily life are ordinary actions. These non-reflective actions that Dewey talked about are always continuous. When the same problem is experienced many times, methods of dealing with similar cases become quite routine (Kember et al., 2000). Prospective teachers have the

habits they have gained until the undergraduate period and their student years during their undergraduate education. Here, activities are related to the occurrence of frequent repetitions, the priority of the purpose of passing the lesson, and the actions taken by the lecturer, as well as the actions that were previously learned and performed automatically. It's all about routine. The absence of significance in this dimension should be considered normal (t = -1.999; p> 0.05). Prospective teachers also emphasized that it is difficult to do activities continuously and write them.

If the sub-factor is considered as seeing that an event or proposition is the result of a previously known rule or formula, the existing information is used directly, that is, without evaluation, and remains in the existing schemes (Kember et al., 2000). It was valid for teacher candidates to transfer precisely what should be done from the existing schemes without thinking (Z = -2.737; p <, 05). This situation, which is in favor of the pretest, may have caused this situation because the candidates were away from schools and students due to the Covid-19 outbreak. Also, at the stage of understanding, the learner acts to understand and apply information without questioning his personal importance within contextual boundaries. Learning and teaching is a difficult domain to understand the subject of philosophy. Understanding the teaching of the instructor may be the reason for understanding the content of the course, the curriculum, and constantly thinking about these issues away from the related environments. Because of the Covid-19 outbreak in the process, only four weeks of teachers and students had an interactive classroom experience.

The third sub-factor, reflection, and self-evaluation of the individual's experiences and meaning from them; that is, the process of deep thinking is a process that causes a change in the conceptual perspective. The individual returns to himself with the events he experiences and / or the information he gains, thinks how to create the best or tries to create a new and different perspective and makes self-evaluations. We can make sense that the candidates are in the process of deep thinking despite negative situations due to the covid-19 outbreak in this dimension (Z = -3.014; p <, 05). Candidates have come to the question of how teachers do this work and reveal their ways. We can think that the subjects started to be questioned; they consider their own self-evaluations; they started to gain their self-regulation skills. They started to use their own self-evaluations due to their frequent feedback to their studies. We can think of this as the features provided by online environments.

In the study of Tok (2017), in the development of teacher candidates' awareness of teaching through professional practices; He emphasized the importance of daily reflective work that supports their creative and critical thinking in their positive attitude towards the profession. Besides, in this study, the awareness of prospective teachers participating in the pedagogical formation education certificate program regarding their teaching practice processes was determined through reflective diaries, and it was found that the levels of awareness of teacher candidates regarding their teaching processes were quite low. We can say that this finding is not compatible with this research due to the online environment.

The fourth sub-factor is critical reflection. Criticism is to bring about as a result. Critical reflection is the individual's reassessment of what they experience, what they have learned and revisiting itself with a new and different perspective. We can think that the candidates review and continue to review their teaching and themselves, are open to criticism and begin to evaluate the situation and will continue to do so (Z = -2,690; p <, 05). In this, we can also consider the effect of the philosophy of their fields. The study is compatible with Töman's (2015) research. It is critical reflection, which includes awareness of the reasons behind our perceptions, emotions and actions. This includes being aware that our values and beliefs regulate our actions and that our assumptions are influenced by our conscious and unconscious prior learning and outcomes, and to evaluate them critically (Ghanizadeh, 2017, p. 104). The aim of critical reflection is to challenge our assumptions and reach a deeper, more sophisticated understanding of a phenomenon (Mezirow, 1998). For this purpose, pre-service teachers may have influenced their thinking about the lesson plans, student worksheets, materials, philosophy lessons in EBA and sharing them (ders.kasefuk.org - forum, chat

etc.). Candidates also saw and used the options to communicate with the lecturer on a timeless basis within the course and the site.

When we look at the scale of reflective thinking in general, we can think that online teaching improves students' reflective thinking skills (Z = -2,690; p <, 05). In this context, the students to be trained by teachers should be included in their studies to be hopeful and productive individuals who look forward to the future (Li & Lal, 2005; Murphy, 1998). It is the finding of this research that they are informed about reflective thinking before being a teacher in this way, they are involved in activities in this regard, and develop motivations for writing. There are many activities to develop students' reflective thinking and reflection skills. However, activity arrangements for prospective teachers to reflect are available in studies showing that reflection does not guarantee that it will occur (Mewborn, 1999). Here, the online environment faced by candidates and their efforts to improve themselves, despite their difficulties in using this environment (lack of computers, problems with internet connections, lack of EBA passwords, etc.) is also important. Today, technology is seen as a powerful tool that can be used to support reflective thinking, and it has been suggested that it has four different design forms, namely process display, process explanation, process modelling and reflective social discourse integrated with video, internet and communication systems (Lin et al., 1999). Kızılkaya (2009) expresses these four design forms. In this study, the online environment provided the following. a. In this environment, which was taken as a process demonstration, the teacher candidate clearly showed what he was doing while doing a job in teaching, learning a concept, the system recorded all the activities of the candidate. It gave him the opportunity when he wanted to see what he did in the process or at the end. This situation is clearly displayed on the application site. b. When we look at the process as an explanation, the technological system provides the necessary guidance to follow the candidate. Chat and forum, short-term weekly exams were used on the site. With this inquiry, learners were helped to explain/find the reasons for their activities and the decisions they made. c. The environment that we call process modelling is related to the cognitive apprenticeship method. Here, the way a specialist follows in solving a particular problem is modelled, and this modelling is used as a guide for candidates to follow the process. D. Reflective social discourse, on the other hand, is based on the fact that reflecting is a social activity different from the others and the effect of the candidates among each other has also participated in this activity. Learners in reflective social discourse design interact as a social community by sharing their learning experiences and making reflective discourses. The learner receives feedback from the social community regarding their activities, restructures and organizes the learning experience. The online environment (http://ders.kasefuk.org) is thought to provide more opportunities and time for prospective teachers, as mentioned in Chen's (2008) study.

In the study where Sağır and Bertiz (2016) compared the science group pedagogical formation students and science teacher students, reflective thinking skills levels found a significant difference in favour of science teacher candidates. He suggested that reflective thinking activities should be included in teacher training programs and that pedagogical formation education should be carried out with methods and practices that would improve thinking skills. In the studies of Özaydınlık and Erdem (2017), it was stated that the students who examined pedagogical formation students' perceptions about reflective thinking levels and their instructional decision processes were "highly high" and critical reflection levels were "high". Tok (2008) investigated the attitude towards the teaching profession in the classroom teaching program of the Faculty of Education at MKU and explained the effect of reflective thinking activities on students' performance in favour of the experimental group.

Urhan and Erdem (2018) investigated the contribution of digital documentary production as reflective practice to improving the reflective thinking skills of prospective teachers, and it was found that the digital documentary production practice does not make a significant difference in the perceptions of reflective thinking levels of the prospective teachers in the collaborative project-based learning process. It has been determined that the answers given by the students in the reflection reports are mostly at the level of reporting, answering and associating and the reasons for this situation are; The quality of the questions was examined and interpreted in terms of believing in the task and the

quality of the task. Ulusoy and Altın (2018) analyzed the grades of candidates studying in the pedagogical formation course in the Introduction to Education Science course with four reflective diaries, and the majority of prospective teachers' diaries consisted of lower technical (60%) thoughts. The higher level of reflective thoughts is proportionally more. They saw that it was less. They stated that teacher candidates should be taught directly and explicitly how to write reflective diaries.

Aras, Park and Park (2019) used the Reflective Thinking Scale developed by Güney (2008), and the reflective thinking levels of prospective teachers were high. This finding is compatible with this study. In the studies of Eğmir and Ocak (2018), they investigated the effect of critical thinking skills curriculum design developed by researchers on the reflective thinking skills of 5th-grade students, and they used the "Reflective Thinking Scale" developed by Yıldırım (2012). Reflective thinking access scores of students differ significantly according to the variables of daily time spent on computers, tablets and smartphones, and the purpose of using the Internet, gender, socioeconomic level, number of books read in a month, daily time spent on TV, and participation status in extracurricular activities. It did not differ.

Adatepe (2018) investigated the relationship between pre-service teachers' entrepreneurship characteristics and reflective thinking levels. In the research, Semerci (2007), "Reflective Thinking Tendency Scale" and Yılmaz and Sünbül (2009), "Entrepreneurship Scale for University Students" were used as data collection tools. It is seen that pre-service teachers got the highest score in the reflective thinking disposition sub-dimension from the "Questioning and Effective Teaching" sub-dimension. It is seen that female teacher candidates are more reflective thinking than male teacher candidates. According to the class variable, a significant difference was found in all other sub-dimensions except "Continuous and Purpose Thinking" sub-dimension. The entrepreneurial traits of prospective teachers were found to be at the "high entrepreneurship" level. According to the class variable, it is seen that the pre-service teachers who attend the 2nd and 3rd grades have higher entrepreneurship characteristics. Also, a significant difference was found between the groups in the entrepreneurship scores, work experience variable of prospective teachers. A positive and significant relationship was found between entrepreneurship and all reflective thinking sub-dimensions. In line with the findings, it was stated that pre-service teachers are individuals with high reflective thinking levels with high entrepreneurship characteristics.

In the researches of Zembat, Yılmaz and Küsmış (2019), the relationship between pre-service teachers' reflective thinking tendencies and attitudes towards the teaching profession has not been differentiated according to teaching practice experience. Besides, it was determined that there is a high level, positive and significant relationship between the reflective thinking tendencies of the teacher candidates and their attitudes towards the teaching profession. In the study of Erol (2019), biology teachers and prospective teachers have examined to what extent they know and apply reflective thinking. In determining the reflective thinking levels of prospective teachers, Kember et al. (2000) defined reflective thinking levels; habit, understanding, reflection and critical reflection are used. From the analysis of the data obtained, it was determined that the pre-service teachers' thinking levels remained mostly at the level of "understanding". It was seen that reflective thinking level did not change according to gender. Whether or not taking lessons on reflective thinking revealed a significant difference in the "critical reflection" sub-factor. Based on the data obtained, recommendations were made to both school education and teacher education. İshak and Tunç (2019) investigated the relationship between middle school students' reflective thinking tendencies in problem-solving and their problem-solving skills perceptions. Also, it was found that there was a moderate, positive and significant relationship between perceptions of problem-solving skills and reflective thinking tendencies in problem-solving and reflective thinking tendencies in problem-solving. As can be seen in this example, reflective thinking will contribute to obtaining more findings through research on different skills in many different fields and to improve the quality of education.

Results for Online Information Search Strategies

There are researches that students have been using the Internet as the primary source of data from a young age (Lorenzen, 2002; Kurgan and Argan, 2007). The research is not compatible with the research of Sırakaya and Çakır (2014). The reason for this study is that the candidates in the pedagogical formation certificate program continued their education in an online environment and reported their studies and thoughts every week, received feedback from the lecturer, discussed their views in chat and forums, often had midterm exams, and watched presentations on these topics.

Pre-service teachers know the strategies for searching information on the Internet in order to distinguish between disorientation and select the main ideas; in the use of evaluation, they showed that they could select, compare, compare and present the information available on the Internet, compare programs, find and compare the information and programs they find, and compile and present them. Likewise, they show that they can develop new ways of thinking, trial and error according to search results, use search engines according to their purposes, and convert them according to their domains. In the use of problem-solving and control strategies, it showed that what pre-service teachers searched for their purposes, how to use the information, how to use url, browser, links and search options, and how to use the database and search engine. Drawing attention to the similarity between the features of the Web and the features that characterize creative individuals, Shoshani and Hazi (2007) assume that the Web promotes creativity, a higher order of learning by providing content access in various disciplines. Briefly, even if such an online learning environment will be turned into a face-to-face education environment, it is beneficial for it to continue to be used. It is recommended that teachers use technology in pre-service and in-service processes (Akpınar, 2003; İpek&Acuner, 2011). The online environment (http://ders.kasefuk.org) has been effective in increasing this diversity.

In the studies of Erdemir, Bakırcı and Eyduran (2009), prospective teachers stated that they were not able to prepare complex and multi-purpose teaching devices while they found themselves sufficient to use search engines and to prepare simple materials for teaching purposes. In this study, medium and straightforward level materials have been prepared for teaching purposes. It is conceivable that experimental studies on complex and multi-purpose material development should be developed in prospective teachers studying in different faculties of education at faculties of education.

DISCUSSION

For prospective teachers, both scales can provide feedback on performing research-based online learning tasks and their strengths and weaknesses in teaching practices and increase both self-control and self-efficacy of learning processes. On the other hand, these scales for educators can contribute to designing and understanding an online curriculum that includes online information search and understanding students' needs. Likewise, it can provide reflection and understanding of reflective thinking. For research, it will be useful to investigate further the development and reflective thinking of students' online information search strategies and to examine the relevant factors affecting these strategies and features.

Suggestions to Researchers

Researchers can investigate the effects of teachers, prospective teachers and students on the online self-efficacy of information-seeking strategies on Internet self-efficacy, on general self-efficacy and field self-efficacy, on academic success and cognitive learning. The relationships between teachers, prospective teachers and students' online information search strategies and the level of web pedagogical content knowledge competence can also be questioned. These studies can contribute to improvement efforts in learning and teaching by seeing our strengths and weaknesses.

REFERENCES

Baykara-Özaydınlık, Ö. ve Erdem, M. (2017). Pedagojik formasyon öğrencilerinin yansıtıcı düşünme düzeyi algıları ve öğretimsel karar süreçleri. Uluslararası Toplum Araştırma Dergisi, 7(13), 325-346.

Akgün, F., (2013), Öğretmen Adaylarının Web Pedagojik İçerik Bilgileri ve Öğretmen Öz-Yeterlik Algıları ile İlişkisi, TrakyaÜniversitesi Eğitim Fakültesi Dergisi 2013, Cilt 3, Sayı 1, 48-58

Ülker, Mustafa. Özdüzenleme ve yansıtıcı düşünmenin matematik başarısına etkisinin incelenmesi. Yayınlanmamış yükseklisans tezi. Balıkesir Üniversitesi Fen Bilimleri Enstitüsü, 2019.

Zan, B.U., Pedagojik formasyon sertifika programına kayıtlı öğretmen adaylarının bilgi okuryazarlığına ilişkin görüşleri, Journal of Human Sciences, Volume 16, No 1

Sırakaya, M., Çakır, H., (2014), Öğretmen Adaylarının Çevrimiçi Bilgi Arama Stratejilerinin Belirlenmesi, Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi (KEFAD) Cilt 15, Sayı 2, Sayfa 191-206

Lee, M.H. &Tsai, C.C. (2010). ExploringTeachers' Perceived Self Efficacy and Technological Pedagogical Content Knowledge withRespecttoEducationalUse of the World Wide Web. InstructionalScience: An International Journal of the Learning Sciences, 38(1), 1-21.

Gömleksiz, M. N. &Fidan, E. K. (2011).Pedagojik Formasyon Programı Öğrencilerinin Web Pedagojik İçerik Bilgisine İlişkin Öz-Yeterlik Algı Düzeyleri. Turkish Studies - International Periodical For The Languages, Literature and History of Turkish or Turkic Volume 6/4 Fall 2011, p.593-620 , TURKEY.

İshak, K., Tunç, M., (2020), OrtaokulÖğrencilerinin Problem Çözmeye Yönelik Yansıtıcı Düşünme Eğilimleri ile Problem Çözme Becerilerine Yönelik Algıları Arasındaki İlişki, Inonu University Journal of the Faculty of Education (INUJFE) . 2020, Vol. 21 Issue 1, p87-101. 15p.

Erol, O., (2019), öğretmenlerin ve öğretmen adalarının yansıtıcı düşünme konusundaki görüş ve uygulamaları, Trabzon üniversitesi, YLisanüstü Eğitim Estitüsü, Yükseklisans tezi, Trabzon.

Zembat, R., Yılmaz, H., Küsmüş, G.İ., Okul Öncesi Öğretmen Adaylarının Yansıtıcı Düşünme Eğilimleri ile Öğretmenlik Mesleğine Yönelik Tutumları Arasındaki İlişkinin İncelenmesi, Eğitim KuramveUygulama Araştırmaları Dergisi 2019, Cilt 5, Sayı 2, 172-186

Adatepe, S., Beden Eğitimi ve Spor yüksekokulunda okuyan öğretmen adaylarının girişimcilik özellikleri ile yansıtıcı düşünme düzeylerinin incelenmesi

Eğmir,E., Ocak, G., (2018), Eleştirel Düşünme Becerisi Öğretim Programı Tasarısının Öğrencilerin Yansıtıcı Düşünme Becerilerine Etkisi, Kuramsal Eğitimbilim Dergisi. Jul2018, Vol. 11 Issue 3, p431-456.

Aras, B., Park, İ., Park, F., (2019), Öğretmen Adaylarının Yansıtıcı Düşünme Düzeyleri Ve Bazı Değişkenlere Göre İncelenmesi Uluslararası Bilim ve Eğitim Dergisi, Volume 1, Issue 2

Ulusoy, M., Altın, D., (2018), Öğretmen Adaylarının Yansıtıcı Yazılı Anlatımlarının Değerlendirilmesi, Turkish Studies Educational Sciences, Volume 13/27, Fall 2018, p. 1553-1562

Urhan, N., Erdem, M. (2018), İşbirlikli Proje Tabanlı Öğrenme Sürecinde Dijital Belgesel Üretiminin Yansıtıcı Düşünmeye Katkısı, Journal of Faculty of Educational Sciences. 2018, Vol. 51 Issue 1, p27-53. 27p.

ŞuleElmalı, Fatime Balkan Kıyıcı, Fen Bilgisi Öğretmen Adaylarının Yansıtıcı Düşünme Eğilimleri Ve Yansıtıcı Düşünmeye İlişkin Düşünceleri,

lköğretim Online, 17(3), http://ilkogretim-online.org.tr/index.php/io/article/view/2994

Arslan, M.M., (2017). Adayların Yansıtıcı Günlüklerinde Öğretmenlik Uygulamasına Yönelik Farkındalıkları, Bartin Üniversitesi Egitim Fakültesi Dergisi Vol. 6, sayı 3.

URL 1 MEB https://oygm.meb.gov.tr/meb_iys_dosyalar/2017_12/13160515_FELSEFE.pdf

Şafak ULUÇINAR Sağır, Ş.U., Bert, H., (2016), Fen Bilimleri Öğretmen Adayları ve Pedagojik Formasyon Fen Grubu Öğrencilerinin Yansıtıcı Düşünme Becerilerinin Karşılaştırılması, Bartın Üni. Eğitim Fakültesi Dergisi, cilt 5, sayı 2, s.385-404

Özaydınlık, K.B., Ardem, M., (2017), Pedagojik Formasyon Öğrencilerinin Yansıtıcı Düşünme Düzeyi Algıları ve Öğretimsel Karar Süreçleri, OPUS, Uluslararası Toplum Araştırma Dergisi, cit 7, sayı 13.

Tok, Ş., (2008), Pedagojik Formasyon Öğrencilerinin Yansıtıcı Düşünme Düzeyi Algıları ve Öğretimsel Karar Süreçleri, EğitimveBilim, cilt 33, sayı 149

Aktaş, B.Ç., (2017), Pedagojik Formasyon Programı Öğrencilerinin Eleştirel Okuma Özyeterlik Algısı Ve Yansıtıcı Düşünme Eğilimlerinin incelenmesi, Elektronik Sosyal Bilimler Dergisi, cilt 15, sayı 59 (1186-1202).

Chizmar, J. F., &Walbert, M. S. (1999). Web-based learning environments guided by principles of good teaching practice. Journal of Economic Education, 30(3), 248–264

Çiğdem, H., & Kurt, A. A. (2012). Adaptation of Reflective Thinking Scale to Turkish. Uludağ Üniversitesi Eğitim Fakültesi Dergisi, 25(2), 475-493 [41]

Elmas, Ç., Doğan N., Biroğul, S. veKoç M. S., (2008). .Moodle eğitim yönetim sistemi ile örnek bir dersin uzaktan eğitim uygulaması. Bilişim Teknolojileri Dergisi, 1(2), 53-62.

Tsai, C.-C., & Lin, C.-C. (2004). Taiwanese adolescents' perceptions and attitudes regarding the Internet: exploring gender differences. Adolescence, 39, 725–734

Peng, H., Tsai, C. -C, & Wu, Y. -T. (2006). University students' self-efficacy and their attitudes toward the Internet: The role of students' perceptions of the Internet. Educational Studies, 32(1), 73-86.

Poole, D. M. (2000). Student participation in a discussion-oriented online course: a case study. Journal of Research on Computing in Education, 33(2), 162–177

Aşkar, P., &Mazman, S. G. (2013). Çevrimiçi bilgi arama stratejileri envanterinin Türkçe'ye uyarlama çalışması. Eğitim ve Bilim, 38 (168), 167-182.

Tsai, M. J., & Tsai, C. C. (2003). Information searching strategies in web-based science learning: The role of Internet self-efficacy. Innovations in Education and Teaching International, 40(1), 43-50.

Tsai, M. J., Liang, J. C., Hou, H. T., & Tsai, C. C. (2012). University students' online information searching strategies in different search contexts. Australasian Journal of Educational Technology, 28(5), 881- 895.

Jansen, B. J., & McNeese, M. D. (2005). Evaluating the effectiveness of and patterns of interactions with automated searching assistance. Journal of the American Society for Information Science and Technology, 56(14), 1480–1503.

Hartley, K., & Bendixen, L. D. (2001). Educational research in the Internet age: examining the role of individual characteristics. Educational Researcher, 30(9), 22–26.

Hsu, Y. C., & Shiue, Y. M. (2005). The effect of self-directed learning readiness on achievement comparing face-to-face and two-way distance learning instruction. International Journal of Instructional Media, 32(2), 143–156.

Hill, J. R. (2002). Overcoming obstacles and creating connections: community building in web-based learning environments. Journal of Computing in Higher Education, 14(1), 67–86

Kember, D., Leung, D., Jones, A., Loke, A. Y., McKAy, J. Sinclair, K., Tse, H., Webb, C., Wong, F.K.Y., Wong, M., & Yeung, E. (2000). Development of a questionnaire to measure the level of reflective thinking. Assessment and Evaluation in Higher Education, 25, 380-395.

Kurubacak, G. &Wiburg, K. (2002). Designing a Technology, Society and Education Course. In D. Willis, J. Price & N. Davis (Eds.), Proceedings of SITE 2002--Society for Information Technology & Teacher Education International Conference (pp. 2499-2503).

Roper, A. R. (2007). How students develop online learning skills. Educause Quarterly, 30(1), 62–64.

Shoshan, Y, &Hazi, R.B., (2007) The Use of the Internet Environment for Enhancing Creativity, Educational Media International, 44:1, 17-32

Garrison, D. R., Cleveland-Innes, M., & Fung, T. (2004). Student role adjustment in online communities of inquiry: model and instrument validation. Journal of Asynchronous Learning Networks, 8(2), 61–74.

Discenza, R., Howard, C., & Schenk, K. (2002). The design & management of effective distance learning programs. Hershey, PA: Idea Group Publishing

Walraven, A., Brand-Gruwel, s., &Boshhuizen, H.P.A, (2009), Computers & Education, Volume 52, Issue 1, Pages 234-246

ÖYGEM, 2017, https://oygm.meb.gov.tr/meb iys dosyalar/2017_12/11115355_YYRETMENLYK_MESLEYY_GENEL_YETERLYKLERY.pdf