How Digital Reading Differs from Traditional Reading: An Action Research

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Abstract

The purpose of this research is to examine the insights of preservice teachers' new literacies throughout online research and comprehension. The study is grounded in an online research and comprehension perspective. In the study, the action research design of qualitative approaches was selected as the method. The participants in the research were nine teacher candidates studying in the first year of the Classroom Teacher Education Programme at Erciyes University. The teacher candidates took part in two online research and comprehension tasks about children's literature and teaching materials lasting 28 hours in total. Following, the preservice teachers' perspectives regarding this process were elicited through semi-structured individual interviews. The findings reveal that the internet has resulted in certain changes in the nature of information and learning. During the online research and comprehension process, the preservice teachers employed strategies for information location, determining reliability, reading, and online information synthesising and content creation. Moreover, during this process the preservice teachers developed certain digital skills as well as their online research and technology competencies and awareness of reliable information. All these findings have contributed to the exploration of teacher candidates' new literacy skills, strategies, and dispositions.

Keywords: Teacher education, online research and comprehension, digital skills and dispositions.

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INTRODUCTION

From past to present, literacy has continued to be a constantly changing and transforming phenomenon (Leu, Kinzer, Coiro, Castek, & Henry, 2013; Leu, McVerry, O'Byrne, Kiili, & Zawilinski, 2011; Leu, Zawilinski, Forzani, & Timbrell, 2015; Leu, Everett-Cacopardo, Zawilinski, Mcverry, & O 'Byrne, 2012). Some of the factors affecting the transformation of literacy are democratisation, economic developments, information and communication technologies, and cultural changes (Leu, Kinzer, Coiro, & Cammack, 2004). Looking at the present day, it can be seen that with the spread of information and communication technologies, activities such as reading, research, writing, and watching videos on the internet and on computers have increased (Rideout, Foehr, & Roberts, 2010; TUİK, 2017). Currently, being literate means being able to use new technologies like Google Docs, Skype, iMovie, Contribute, Basecamp, Dropbox, Facebook, Google, Foursquare, Chrome, educational video games, or thousands of other applications and e-books (Leu et al., 2011; Leu et al., 2013). Reading and meaning construction are shifting directly from printed materials towards online reading and writing. Accordingly, the skills, strategies, and dispositions needed by individuals also change (Lankshear & Knobel, 2011; Leu et al., 2013). Despite all these developments, researchers reveal that teachers have not adequately integrated information and communication technologies into the teaching of reading and writing (Hutchison & Reinking, 2011; Pang, Reinking, Hutchison, & Ramey, 2015; Yamaç & Öztürk, 2018). For students to adapt to professional and societal life in today's world, they need both traditional reading and writing skills and the new literacy skills. Therefore, there is a need for research into the subject of exploring and developing the online research and comprehension skills of teacher candidates, the implementers of the future.

A Dual-Level Theory of New Literacies

Researchers attempting to explore the differences between reading printed matter and reading in online contexts have put forward various conceptualisations. Online research and comprehension (Leu et al., 2013), multiple source reading (Cho, Afflerbach, & Han, 2018), and digital reading (Salmerón, Strømsø, Kammerer, Stadtler & van den Broek, 2018) are some of these. These conceptualisations attempt to explain the reading and comprehension processes, skills, and strategies used in online contexts. Online research and comprehension is a specific research field examined by a dual-level theory of new literacies. The dual-level theory of new literacies is an approach, which attempts to bring together under one umbrella all the perspectives related to literacy appearing now. According to this theory, new literacy has two levels, namely lowercase (new literacies) and uppercase (New Literacies) (Leu et al., 2013; Leu et al., 2015). Lowercase new literacy explores a specific field of new literacy or a new technology such as the social communicative transactions that occur through text messaging and understanding what one reads online (Leu et al., 2013). Lowercase new literacy acknowledges many perspectives, technologies, and applications (Leu et al., 2015). Uppercase New Literacy, however, is formed from the common and consistent findings that emerge from studies conducted based on the lowercase new literacy perspectives.

One of the areas that lowercase new literacy examines is reading in online contexts. This theoretical viewpoint conceptualises reading as "online research and comprehension". According to researchers examining online reading, traditional reading skills are required for obtaining information and reading on the internet, yet they are insufficient alone (Cho et al., 2018; Salmerón et al., 2018; Zhang & Duke, 2008). Internet reading requires the reader to make strategic decisions, in line with his/her aim, as to what he/she will read and in which order he/she will read them (Cho & Afflerbach, 2015). Online reading is a process of self-directed text construction (Coiro & Dobler, 2007). In contrast with traditional reading, online research and comprehension regards reading as a problem-based inquiry process involving five steps (Leu et al. 2011; Leu et al., 2013; Leu et al., 2015). New skills, strategies, and dispositions are required for finding information on the internet, evaluating the reliability of the information, and for synthesising and communicating the information (Leu et al., 2004). This research is theoretically based on the perspective of online research and comprehension.

Previous Research

Various studies based on the theoretical framework of the new literacies have examined how the internet and other information and communication technologies can be integrated into literacy education (Hutchison, Beschorner, & Schmidt-Crawford, 2012; Hutchison & Woodward, 2014; Larson, 2010). The studies conducted suggest that through the integration of tablets and various digital applications into literacy lessons, students can develop both their traditional literacy and their new literacy skills together (Hutchison et al., 2012) and that digital reading tools develop the new literacy practices and enhance the relationship between reader and text (Larson, 2010).

Other studies carried out at primary, secondary, and high school levels and at university level related to online research and comprehension have attempted to discover the cognitive processes and strategies in reading (Afflerbach & Cho, 2009, 2010; Coiro & Dobler, 2007; Castek, 2008; Coiro, 2011; Coiro & Dobler, 2007; Dwyer, 2016; Esmer & Ulusoy, 2015; Schmar-Dobler, 2003). The studies conducted reveal that for online reading environments, in addition to the reading strategies used while reading traditional printed texts, readers use reading strategies for inquiry such as concept identification, information-seeking on the internet, and critical evaluation (Afflerbach & Cho, 2009; Coiro & Dobler, 2007; Coiro, Sekeres, Castek, & Guzniczak, 2014; Esmer & Ulusoy, 2015; Schmar-Dobler, 2003; Zang & Duke, 2008).

While studies related to the cognitive processes and strategies for online research and comprehension are frequently conducted, there are fewer studies regarding online dispositions and affective items (Coiro, 2008, 2009; O'Byrne & McVerry, 2009; Putman, 2014; Putman, Wang & Ki, 2015). In a study done by O'Byrne and McVerry (2009), an instrument for online reading comprehension dispositions was developed. In this instrument, five subdimensions related to online dispositions are found, namely critical stance, reflective thinking, persistence, flexibility, and cooperation. In another study conducted on reading dispositions, Putnam (2014) developed a tool for measuring online reading attitudes and behaviours. This measurement tool is composed of subdimensions of online reading dispositions named self-efficacy, motivation, anxiety, self-regulatory behaviours, and value. In other studies done about online reading dispositions, it is observed that there is a significant relationship between online reading disposition and online reading skill (Coiro, 2008) and that since students find the internet to be practical, valuable, and attractive, they are willing to endure the hardships of online reading (Coiro, 2009).

Research Aim

In today's world, literacy skills and strategies based on traditional printed materials are not sufficient to become fully literate. While teachers' roles in new literacy classrooms have changed, they have become even more important. Teacher training and teachers' professional development related to the new literacies should be given greater focus and more attention (Leu et al., 2013). Studies conducted reveal that preservice teachers are lacking in knowledge of online reading and comprehension strategies and that their online reading skills are not at a desired level (Ulusoy & Dedeoğlu, 2015; Esmer & Ulusoy, 2015). Teacher candidates' skills, dispositions, and strategies in the online research and comprehension process should be explored. There is a need for studies aimed at exploring students' processes for writing questions, locating information, passing the located information through a critical filter, synthesising the information, and creating content on the subject they are to investigate in the online comprehension and research process. Moreover, studies should be conducted regarding how preservice teachers can develop their online research and comprehension skills. The aim of this study is to explore the development of preservice teachers' new literacies. By means of the data obtained, clues can be gained regarding the new literacy skills, strategies, and dispositions of teacher candidates. By furthering the understanding of teacher candidates' new literacy skills, recommendations can be made related to programmes for educating future teachers and to primary school teaching programmes.

Research Question

In what ways nine preservice teachers develop their insights on new literacies during the course of online research and comprehension?

METHOD

Research Design

This study was conducted based on the action research design. "Action research is conducted by one or more individuals or groups for the purpose of solving a problem or obtaining information in order to inform local practice" (Fraenkel, Wallen & Hyun, 2012, p.589). "Educators reflect about these problems, collect and analyse data, and implement changes based on their findings" (Creswell, 2012, p.577). The information gained through action research is used to gain understanding about a problem, to develop a new practice, to bring positive changes around the school, or to improve student performance (Mills, 2014). In this study, preservice teachers' insights of new literacies during online research and comprehension have been explored. The aim has been to gain a thorough understanding about what preservice teachers' experiences are when conducting online research and comprehension in the internet environment, and how they experience these.

Participants

The study was conducted during the second semester of the 2017-2018 academic year with first-year students in Classroom Teacher Education at the Education Faculty of Erciyes University, within the scope of their Computers II course. The computer course is given to students who have not passed the multiple-choice exemption exam given in the first semester of the academic calendar. In this regard, 21 students attended the class. Some students preferred to attend the course without having taken the exemption exam, while others took the course because they had not passed the exemption exam. In the Computers I course, basic training related to Word, Excel, and PowerPoint, websites, e-mail management, and Google applications was given. In the Computers II course, education in online research and comprehension was given. Out of 21 students, 19 students participated in the implementations for the online research and comprehension training and submitted their assignments. Of these 19 students, semi-structured individual interviews were conducted with the nine students (five females and four males) who achieved the 70% pass mark or more from their assignments.

Online Research and Comprehension Training

The implementation was conducted in 28 lesson hours over a total of 7 weeks. During this period, the students were asked to conduct research into children's literature and teaching materials. The instructor modelled the online research process for the students and the students were asked to create content by using the online research and comprehension steps. Using the steps for forming important questions, locating information, evaluating information, synthesising information and creating content, and communicating information, the instructor modelled a sample of research in the field of reading difficulties for the students. The students were told that they firstly had to identify important questions related to the research topic. Basic questions, alternative questions, and concepts related to reading difficulties were written in a sample file. In the second step, methods of accessing documents such as articles, books, presentations, or research reports based on the questions identified (information location strategies) were taught. In the third step, reliable and unreliable information and documents were shown to the students. It was explained that information and documents like academic articles, reports of various organisations, and digital books on university databases should be trustworthy, otherwise none of the information on the internet could be used. In the fourth step, note taking, summarising, and synthesising the various data obtained from the reliable information and documents located, as well as creating content in their own words by synthesisation, were taught. In

the fifth step, the students were shown how to share the content created on platforms like blogs and social media. Based on all these steps, the students completed their first research projects on children's literature. Based on the five-step online research process, they created a research report in Microsoft Word. They submitted the first version of their assignments to the instructor on the digital learning platform Turnitin. Turnitin is a learning environment possessing features such as detecting plagiarism, commenting on assignments, and giving feedback. The instructor evaluated the assignments submitted by means of an analytic scaled grading key in the subdimensions of content, orthography and layout, originality, interestingness, and research process, and gave feedback. Based on this feedback, the students revised and resubmitted their assignments. All these steps were also implemented in the teaching materials research. The research related to children's literature was required as a Microsoft Word file, while the research related to materials development was required as both a Microsoft Word file and a multimodal composition. During this process, applications such as Google Chrome, Google Drive, Google Scholar, Google Drawings, Acrobat Reader, Google Search, Google Blogger, Movie Maker and Photo Story 3, University Databases, Microsoft Office Word, and YouTube were used.

Data Collection Techniques and Process

One of the most frequently used techniques for collecting data in action research is interviewing. The action researcher can formally interview students, parents, or colleagues to gain in-depth understanding. However, one of the important challenges of the interview is that the questions are expressed in such a way as to elicit the information to be accessed (Mills, 2014). To reveal the preservice teachers' online research and comprehension insights, a semi-structured interview form was used. After the draft interview form was prepared, three researchers reviewed it, two of whom were experts working in literacy education, and one was a language expert. After some alterations were made in the interview form, pilot interviews were conducted with two students. At the end of the implementation, individual interviews were conducted with the teacher candidates. These interviews lasted between 19 and 60 minutes.

Data Analysis

The data obtained was analysed by following the steps suggested by Creswell (2013): data managing, reading and memoing, describing/classifying/interpreting, and representing and visualizing. According to Creswell, in qualitative analysis, the points commonly emphasised by researchers are coding of data, identifying themes from the data, and presenting the data in a comprehensible manner. After the researchers had put the interviews with the preservice teachers in writing, they prepared them for analysis. Firstly, the written records were read from start to finish and small notes were made in the margins, after which the code list was created, and by bringing the codes together, the themes were identified. Finally, the codes and themes were interpreted by presenting.

FINDINGS

Online Research and Comprehension Insights

Following the semi-structured interviews conducted with the preservice teachers, the obtained data was reduced and presented in a conceptually understandable way (See Fig. 1). According to the obtained data, the preservice teachers' online research and comprehension insights were gathered under three main themes, namely the nature of the internet as a research and learning tool, the nature of online research and comprehension, and the nature of digital dispositions and skills.
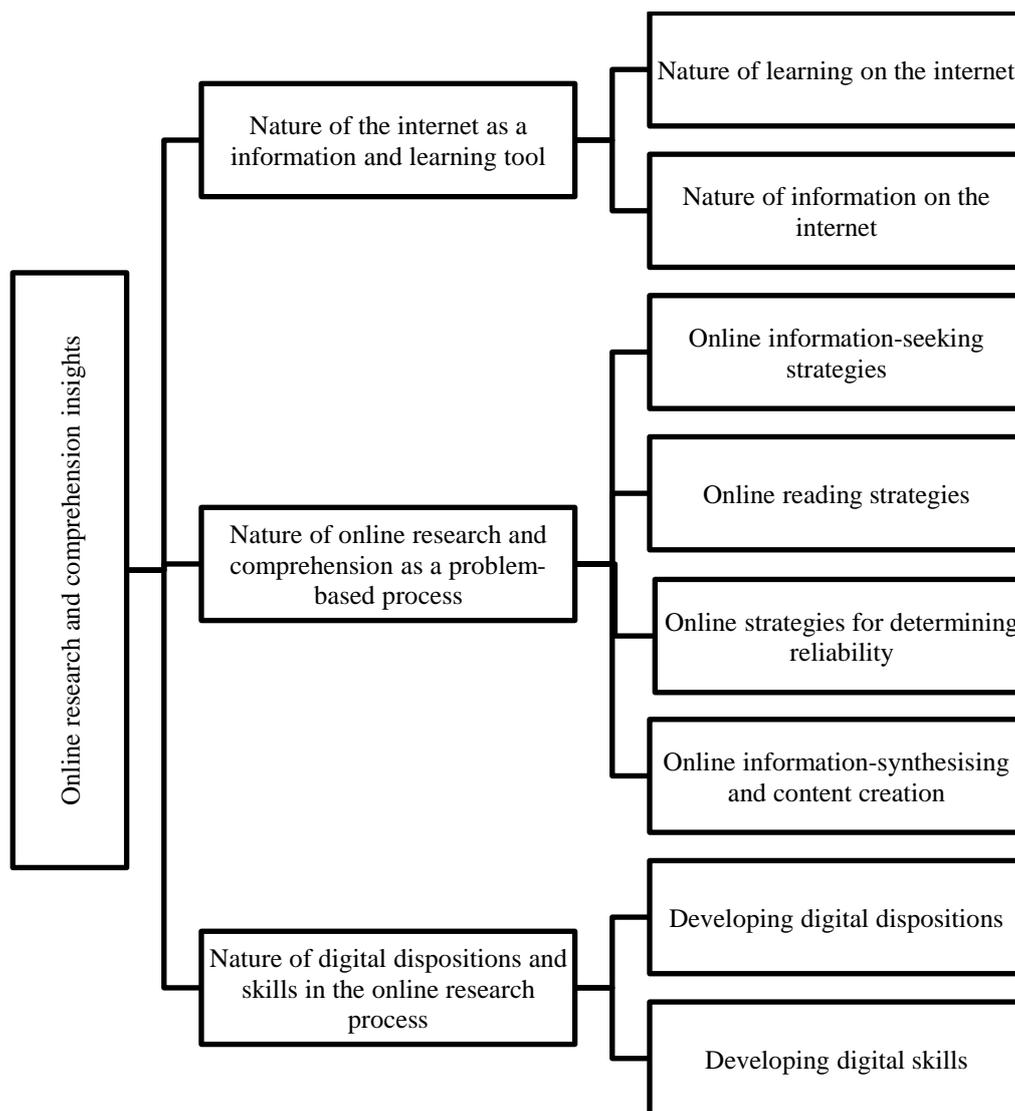
Fig. 1. Themes and Sub-themes Regarding Online Research and Comprehension Insights

Nature of the internet as an information and learning tool. With regard to teacher candidates' insights, on the internet and in a digital context there are certain differences in situations like the nature of information, ways of accessing information, reliability of information, internet information sources, skills required for accessing information, and the multiform nature of the internet when compared to research and learning in printed texts.

Nature of information on the internet. The insights gained by the teacher candidates in the research they conducted on teaching materials and children's literature provide some clues about the nature of information on the internet. Firstly, the teacher candidates stated that locating information on the internet was easy and fast. A large number of documents such as web pages, books, articles, and videos about the topic to be researched can be accessed rapidly and with little trouble. The teacher candidates reported that information on the internet takes on more of a multimodal nature than information in printed materials. While printed materials include more written texts and fewer visuals, information in the internet environment consists of more multimodal content like texts, pictures, sounds, and videos. However, the teacher candidates stated that although there are a large number of documents and content and that information can be rapidly located on the internet, it is difficult to locate reliable information from among this data. Another situation expressed by the teacher candidates regarding the nature of information is that although the internet facilitates knowledge

generation and sharing, it increases information pollution. Moreover, another finding related to the teacher candidates' insights is that the internet facilitates the storing of information through applications like Blogger, e-mail, and Google Drive. Below are some views of the preservice teachers regarding the nature of information on the internet:

> I'm in the groove (laughing). I say," Now you're doing something". This is a nice environment for sharing this. Others can see and comment on the research that we do. It's a nice environment where information can be shared. For example, those wishing to access information can find it. — Gökşin, teacher candidate

> But it's troublesome with regard to reliability. Until I used Google Scholar, I used to enter the first website that appeared when I wrote on the search engine and examine the information. But later I learned. I wasn't verifying it. —Burcu, teacher candidate

Nature of learning on the internet. According to teacher candidates' insights, the fact that accessing information on the internet is rapid and easy leads people towards laziness and copy-paste plagiarism. Indeed, this data that can be located and generated without effort causes serious problems related to reliability. An individual attempting to obtain and learn information on the internet must act in accordance with the online research and comprehension steps. This situation means that additional skills and strategies are needed to locate easy and reliable information and create content on the internet. Another situation arising from the teacher candidates' insights related to learning is the fact that the multimodal nature of the information on the internet makes it easy to learn, increases retention of learning, and catches the attention. Moreover, the fact that creation of content like texts, visuals, and videos with various applications and programmes increases the retention of learning is a situation that arises from the teacher candidates' insights. Below are some views of the preservice teachers regarding the nature of learning on the internet:

> The internet has eliminated the time taken for accessing information. You can locate data as soon as you write. This speed also leads to laziness. In terms of that variety, we are losing the retention of information because of the internet. In fact, since the internet includes a lot of necessary and unnecessary information, it has become difficult to separate it out. — Mutlu, teacher candidate

> There were articles, slides and books, but it was as if they were unfinished. I looked at a few parts of the books. I accessed a thesis. I located visuals as well. I accessed the visuals in the materials. There were videos, but how reliable were they? They explained the teaching materials. I had heard most of what was explained there from other materials. — Sevde, teacher candidate

Nature of online research and comprehension as a problem-based process. There are differences in the nature between online research and comprehension on the internet and reading processes based on traditional printed materials. According to the teacher candidates' insights, these differences are presented under the themes of online information-seeking strategies, online reading strategies, online strategies for determining reliability, and online information-synthesising and content creation.

Online information-seeking strategies. One of the differences between online research and comprehension and reading based on traditional printed materials is the process of searching for and accessing information. Due to differences like the types and number of documents in the digital environment, the means of accessing the information and the context where the information is found, different strategies are required for locating the information. According to their insights, the teacher candidates used different strategies from those used in traditional reading in order to access information in the studies that they carried out related to children's literature and teaching materials. First, the teacher candidates created research questions to limit and frame the information they were to locate. They then defined alternative questions and concepts related to these research questions. The

teacher candidates stated that these research questions and concepts served to limit and frame the information in the information-seeking process. The teacher candidates also stated that they consulted various databases in the university library in order to locate academic content such as e-books and articles. Moreover, another source that they consulted to access information were the Google Scholar application and Google's advanced search options. They stated that by means of an advanced search, they conducted searches based on file type, time, pages containing the exact word, or pages containing any of the words. According to the teacher candidates' insights, by limiting the information, the advanced search options made it easier to locate information related to the questions from among a large amount of data and documents. The teacher candidates also reported that in this process, they used YÖK (The Council of Higher Education) theses with their e-government passwords to access thesis-type documents. Below are some of the teacher candidates' statements regarding information seeking:

> We created questions about the subject we had identified. I tried to produce as many questions as I could. By forming questions, we conducted our research more easily. If we had done it the other way, it would have been a simple research study. — Metehan, teacher candidate

> The research questions made my work a lot easier. What type of questions I will look at, then what type of data I will obtain in the article. It has guided me as to which ones I will obtain and which ones I will not. I used Google Scholar. Hazar

> I made use of Google Scholar. Instead of using normal Google, I sought information there. I wrote in inverted commas. For example, I wrote, "What is children's literature". To obtain clearer data, I looked at the data on the university's database. — Sevde, teacher candidate.

Online reading strategies. According to the teacher candidates' insights, another theme that appears with regard to the differences between online research and comprehension and reading based on traditional printed materials is that of reading strategies. The teacher candidates stated that they used certain strategies to strengthen their comprehension while reading the web pages, articles, theses, or e-books they had accessed related to children's literature and teaching materials. The preservice teachers used the Adobe Acrobat Reader reading programme, especially while reading digital texts like articles, theses, or books. The features of Adobe Acrobat Reader, such as add text, take notes, and highlight made the reading process easier. The teacher candidates stated that they took notes on Adobe Acrobat Reader on the relevant section for whichever research question it was related. They stated that by synthesising the information this way, they made it more organised. The teacher candidates reported that documents like theses, books, and articles contained a great deal of information and that it was not possible to read all of it. They stated that in this case, to access the information that was relevant, they glanced at the headings and focused on the information in the relevant headings. Another strategy used by the teacher candidates in the reading process was summarising. The preservice teachers pointed out that they wrote the important sections by shortening them on Adobe Acrobat Reader with their own words. According to the teacher candidates, scanning information in digital texts makes the reading process easier. They stated that they located any concept or heading within a text by scanning it and that they had read only that section. This also enabled them to save time. Another strategy used by the teacher candidates in the reading process was highlighting the important information. The teacher candidates stated that they colour-highlighted the important information especially by using the colour-highlighting feature of Adobe Acrobat Reader. Below are some of the teacher candidates' statements regarding the strategies they used while reading:

> Also, for example, whatever subject or whatever concept I want to access from there, I write it directly. It appears before me. But for printed materials, I have to find it myself. I have to locate the information by leafing through the pages or reading through lots of pages. — Sevde, teacher candidate

> I read to find out how much it was related with my research topic. Its relevance is very important. I took small notes in the margin. So as to summarise what the sentence meant. In

this way, I gained things that were beneficial for me. There is a lot of writing in an article. I took out the parts of the article that were important. I read a lot of articles. I acted according to the headings. I looked at them to see if there was anything in them related to my research assignment. I read into them and took out the important parts. — Hakan, teacher candidate

Online strategies for determining reliability. The teacher candidates' insights reveal that another theme that emerges related to the differences between online research and comprehension and reading based on traditional printed matter is that of strategies for determining reliability. The fact that it is easy to create content on the internet, that there are a large number of sources, and that there is information pollution makes it difficult to determine reliability in the online research and comprehension process. The teacher candidates stated that they passed information and documents like webpages, articles, reports, and books that they accessed for their research topics through a reliability filter. The preservice teachers also reported that data on the websites of government organisations like TUİK (Turkish Statistical Institute), TDK (Turkish Language Association), or universities and data obtained from documents like articles, theses, and e-books were more reliable. The teacher candidates stated that to determine whether any information they accessed on a web page was reliable or not, they checked the source of the information therein and verified the information by locating the original source. Moreover, the teacher candidates pointed out that they regarded the data they accessed from well-known international organisations like UNESCO and OECD as more reliable. Furthermore, the preservice teachers stated that they confirmed the information they accessed on the internet from several sources. Finally, they also indicated that the academic level of the author who wrote the information was an important criterion for determining reliability. They emphasised that all these strategies had to be passed through a filter for reliability of the data accessed in online reading. Below are some of the teacher candidates' views related to determining reliability:

It is difficult to access reliable information. When we do it from reliable sites, we think that they are reliable. You cannot say that they are 100% reliable but if you look everywhere, when you write in the same way, that is how it is. You think it is reliable. You look at a number of reliable sites. If it says the same thing everywhere, that means it is correct. — Gökşin, teacher candidate

I mostly tried to access the articles that I mentioned before. I gave more importance to these. Theses are also reliable data sources. Of course, these may be prepared in the form of a presentation. I have seen that there are reliable data in presentations, and I have looked at those as well. — Metehan, teacher candidate

Online information-synthesising and content creation. In contrast to traditional reading and writing skills, the online research and comprehension insights of the teacher candidates regarding the subjects of children's literature and teaching materials indicate certain changes in the nature of online information-synthesising and content creation. The teacher candidates stated that to synthesise information and create content online, they made use of a large number of records and documents such as articles, theses, e-books, web pages, and visuals and that they created a rich content. They reported that for synthesising information in particular, they took the research questions as the basis and that they created content according to the research questions by combining data from several sources. The teacher candidates indicated that for online research and comprehension, when they accessed information from various sources and wrote it in their own words, the content was more original and learning was more permanent. Moreover, the preservice teachers stated that due to the multimodal nature of the internet, in contrast to traditional printed content, the content they created online was made up of many forms, such as tables, graphs, visuals, sounds, and videos. The teacher candidates' insights related to online information-synthesising and content creation pointed out certain differences when compared to information-synthesising and content creation with traditional printed materials. Some of the teacher candidates' views related to online information-synthesising and content creation are as follows:

You learn nothing by doing copy-paste. Sometimes you don't even read when you do copy-paste. But when you write by synthesising for yourself, you consider that this was written like this or like that from many sources and it becomes permanent. What kind of books are there in children's literature? What should their content be like, what should their covers be like? You learn about these subjects. — Hazar, teacher candidate

For example, the process is boring and tiring until you create the video. I have created a video. I said, "Ah, is the content like this, you know, is it so pleasing to the eye? Or, would it be more appealing like this? It caught my attention more. When I read information on Word, it is possible for me to forget it, since it is theoretical information. But in video, since I am supported both visually and audially, it is more entertaining and sticks in the mind more. — İpek, teacher candidate

Digital skills and dispositions in the online research and comprehension process. From the viewpoint of digital skills, the teacher candidates stated that their skills in multimodal text creation had developed due to adding, deleting, and arranging multimedia items like sounds, music, and photographs in video creation programmes such as Photo Story and Movie Maker. The teacher candidates also stated that among other digital skills they had acquired in this process, their skills in creating content such as text, shapes and tables had developed by using word processing programmes like Microsoft Office. Moreover, the preservice teachers stressed that thanks to the Acrobat Reader programme, skills such as digital text reading, imaging, organising, and annotation had developed. In this process, the teacher candidates used applications such as Google advanced search, Scholar, Blogger, YouTube, Gmail, Groups, Google Drive, and Google Drawings. The teacher candidates indicated that by means of these applications, their digital literacy skills in online information-seeking, data storing, data sharing, and content creation with sound, script, video and visual file types had developed. Below are some of the teacher candidates' insights related to digital skills:

Text, visuals, schemes and tables. There was one scheme for teaching and learning. I drew it on Word. I drew Dale's Cone of Experience. I formed the table. We created a multimodal text. — İpek, teacher candidate

After creating my video, I uploaded the YouTube video via my own account. Of course, after uploading the video, I performed another check. Is there anything missing from the video? Is there anything unsuitable in my narration or is there a problem with the sound? I checked these as well. After doing this, I shared it on the blog I had opened for myself. Of course, on the one hand I published my research. Mostly so, that it would be a resource. I put both a video and pictures on it on the other hand. — Mutlu, teacher candidate

The preservice teachers asserted that before their online research, they had had no awareness regarding the reliability of the information they had accessed on the internet. They reported that previously, they had not passed any web page or document that they had accessed through a reliability filter and that they had used them as they were. However, they stated that the online research had developed an awareness regarding the reliability of the information on the internet and that they no longer considered using all the information on the internet as it was or without passing it through a reliability filter. Furthermore, the preservice teachers pointed out that during the online research and comprehension process, their self-belief in areas like accessing information, content creation, using various programmes, and doing research online had increased. Below are some of the teacher candidates' insights related to digital dispositions

I did not previously use concepts such as whether the sites for the subjects I researched were reliable or not. I used to present any research I found as homework to the teacher. — Sevde, teacher candidate

My research skills have improved even more. I can do more advanced-level research. Until now, I did not believe that I would do this. After learning these, I have gained a lot of experience. I am a little more experienced with regard to research. — Mutlu, teacher candidate

DISCUSSION

The Internet as an Information and Learning Tool

The teacher candidates' insights showed that the nature of information and learning in printed materials and that of information and learning on the internet are different. Examining the nature of information on the internet shows that the internet provides a variety of sources and facilitates access to information and sharing and storing of information. However, due to information pollution on the internet, accessing reliable information is difficult. Moreover, since the information found on the internet contains more visuals, sounds, and videos than printed materials, it takes many forms. Considering the nature of learning on the internet, according to the insights of the teacher candidates, an individual who lacks online research and comprehension skills is pushed towards laziness and plagiarism because of the copy-paste feature. Therefore, for research and comprehension on the internet, readers must possess additional skills and strategies not required for printed materials.

The findings obtained in the present study are consistent with the principle in the uppercase New Literacies Theory that new literacies are multiple, multimodal, and multifaceted (Leu et al., 2013). In terms of text reading, the internet has enabled an increase in a great number of new and mixed information sources. This situation also increases the problems of accuracy and reliability of information. A successful reader in the online environment is able to decide what he/she will read, how he/she will synthesise the information, how he/she will access the information and how he/she will use the information sources (Bråten, Braasch & Salmerón, 2018; Cho et al., 2018). Empirical studies conducted on online reading and learning reveal that additional skills and strategies are required (Cho, 2014; Coiro & Dobler, 2007).

Moreover, compared to printed material, creating content like text, videos, and visuals on the internet makes learning easier. Another feature of the internet is the fact that its multimodal nature (text, sounds, visuals, and videos) develops learning and information. The internet has caused a series of changes in the nature of information and learning. While reading, writing, and communication in traditional written materials are in two dimensions consisting of text and visuals, in the online environment, they have many dimensions like script, visuals, sounds, music, and videos. The findings of the latest studies, which state that multimodality develops learning and motivation, support the findings of this research (Yamaç & Ulusoy, 2016; Öz & Memiş, 2018; Yeh, 2018).

The Nature of Online Research and Comprehension

The nature of online information-seeking is different from that of information-seeking in traditional texts. Some of the strategies used by the teacher candidates when seeking information in an online context are seeking information from university databases, seeking information on Google Scholar, using Google's advanced searches, seeking information by creating research questions, seeking information by defining concepts, varying the research questions, and seeking information from YÖK theses. Reading strategies used by the teacher candidates during the online research and comprehension process are scanning information and concepts, highlighting important information, note-taking, summarising, reading in line with the research questions, and glancing at headings. Another topic that emerges with regard to the nature of the online research and comprehension process is that of strategies for determining reliability. To access reliable data, the teacher candidates used strategies like seeking information on websites of government organisations, checking information sources, seeking information from articles, books and theses, seeking information from national and international organisations, verifying data from various sources, checking the academic level of the authors and accessing original sources. Another theme that appears with regard to the nature of the

online research and comprehension process is that of synthesising and creating content online. In online research and comprehension, synthesising of information from a large number of sources is carried out according to the research questions. In online research and comprehension, synthesising of information from a large number of sources ensures that the content created is original and that learning is permanent. Synthesisation and content creation in a digital environment are conducted in many forms with a large number of media tools such as visuals, sounds, texts, and videos.

The teacher candidates' insights indicate that online research and comprehension has certain differences when compared to reading and comprehension with traditional printed materials. The nature of online research and comprehension includes information-seeking strategies, reading strategies, strategies for determining reliability, and online synthesising and content creation. The cognitive processes and strategies necessary for structuring understanding of a single text with traditional comprehension strategies are not the same as the cognitive processes and strategies necessary for structuring and understanding information from multiple sources in a digital environment (Afflerbach & Cho, 2009; Cho et al., 2018; Leu et al., 2013; Salmerón et al., 2018). Although reading and comprehension strategies based on traditional printed matter are also important in an online context (Cho, 2014; Coiro & Dobler, 2007; Salmerón, García & Vidal-Abarca, 2018), additional reading strategies are required for locating information and structuring understanding in an online context (Afflerbach & Cho, 2009). The findings of the latest empirical studies conducted with primary, secondary, and high school students and university students related to online research and comprehension strategies support the findings of this study (Cho, 2014; Cho & Afflerbach, 2015; Goldman, Braasch, Wiley, Graesser & Brodowinska, 2012). The findings obtained in a recent study by Cho (2014), conducted with high school students, show similarity with this study. In the study, the students, while reading on the internet, reutilised the strategies used with traditional printed materials for establishing meaning, self-monitoring, and evaluating information by altering them to suit the internet. Moreover, in the same research, the students used text-finding strategies as a new strategy in the online context.

Digital Skills and Dispositions

The teacher candidates' insights reveal that certain digital skills and dispositions have developed in the online research and comprehension process. It was observed that during this process, the teacher candidates' skills in creating multimodal texts, using word processors, reading digital texts, and using various Google applications like YouTube, Blogger, Google Drive, and Google Drawings had developed. Online research and comprehension is not isomorphic with reading traditional printed materials (Coiro & Dobler, 2007; Leu et al., 2013). For online research and comprehension, new social applications and skills are required (Leu et al., 2013). This study reveals the importance of social applications like YouTube, Blogger, and Google Drive and the need for skills in using various digital applications and programmes for effective online research and comprehension.

Another topic that emerges related to the teacher candidates' insights in the online research and comprehension process is that of the new literacy dispositions. It can be seen that during this process, their beliefs related to online research online research and technological skills had increased. In online research and comprehension, besides cognitive dimensions like skills and strategies, affective factors such as self-efficacy, motivation, value, attitude, and anxiety play an important role (Coiro, 2009; Putman, 2014; Putman et al., 2015; O'Byrne & McVeryy, 2009). These dispositions are very important for successful online research and comprehension. Studies conducted show that students who have a high level of self-efficacy in online contexts have high levels of self-regulation skills and online success (Tsai & Tsai, 2003; Moos & Azevedo, 2009). Furthermore, they stated that in the online research and comprehension process, teacher candidates had developed an awareness regarding reliability of information. Reliability of information in the online context must be dealt with differently to reliability of information in printed matter, since in the digital environment, it is very easy to publish information and create content (Leu et al., 2013). For successful online research and comprehension, a critical disposition is required. From this aspect, this study contains valuable

findings related to both the online research and comprehension competencies and the development of awareness of reliable information of preservice teachers.

CONCLUSION AND RECOMMENDATIONS

The aim of this action research was to discover the development of preservice teachers' insights of new literacy in the online research and comprehension process. The study offers an insight into the skills, strategies, and dispositions of the teacher candidates in the online research and comprehension process. Although traditional literacy skills and strategies retain their importance in the online research and comprehension process, the internet environment gives rise to additional skills, strategies, and dispositions. The nature of information and learning on the internet is different from that of traditional printed materials. For effective online research and comprehension, the teacher candidates used information-seeking strategies, reading strategies, strategies for determining reliability, and online synthesising and content creation. During this process, they developed their digital skills by using various technological tools and applications. Moreover, while the teacher candidates had not previously approached the data on the internet with a critical attitude, by means of online research and comprehension they acquired an awareness of reliable information. Finally, their confidence regarding technology and online research skills increased.

All these findings bring forward some recommendations with regard to teaching and research in the new literacies in teacher training programmes. It is recommended that teacher candidates, who will be the teachers of the future, be given training in online research and comprehension. Teacher candidates' skills in using digital technology, the strategies they require for research and comprehension on the internet, and their online reading dispositions should be developed. Further qualitative and quantitative research should be carried out related to the online research and comprehension skills of preservice teachers. This study was conducted with students who had obtained grades of 70% and over for online research and comprehension. Studies may be conducted to compare successful and weak students with regard to online research and comprehension. In the studies, by means of data collection methods like think-aloud protocols, screen monitoring programmes, and observation, online research and comprehension can be examined more deeply. Moreover, there is a need for quantitative studies aimed at measuring and examining the research and comprehension skills, strategies, and dispositions of teacher candidates in larger population samples. This way, factors affecting the research and comprehension skills of preservice teachers can be further explained.

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