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Examining pre-service teacher views on the implementation of screen-based writing instruction

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Abstract

Today, as new technological developments continue to emerge, education, like many other fields, is going through major changes. Technological developments are causing changes to many common concepts. In particular, studies that benefit from technology in the field of education are becoming increasingly widespread, opening the door for the emergence of new teaching methods by abandoning traditional ones. New technologies, and computers in particular, can benefit the teaching of writing, the most complex of the four basic language skills (reading, writing, speaking, and listening). This study aims to explore pre-service teachers' views on screen-based writing practices via a course they attended. A qualitative case study method (holistic single-case design) was employed to explore pre-service teachers' views. The study participants were selected using a purposeful sampling method among 4th year students majoring in Turkish Language Teaching at a major state university. The study group consisted of sixty-two pre-service teachers who were enrolled in the "Written Expression" I and II courses in the 2013-2014 education year. The study was conducted both in Fall and Spring semesters. All writing activities were conducted in a digital environment. The study results revealed that a majority (77%) of the pre-service teachers favored continuation of the screen-based writing instruction. The study supported that digital literacy is important and the advantages of screen-based writing instruction outweighed its disadvantages. Screen-based writing activities should be integrated into the courses and instruction materials of pre-service Turkish teachers' education programs.

Keywords: Screen-based writing, Writing instruction, Digital literacy, Pre-service teachers.

Introduction

Although pen and paper have become less popular in daily life, the act of writing retains its importance. With the increased use of digital technologies, such applications have started to extend to the act of writing as well. People compose many text messages and electronic mails each day and create text files on their computers. Although it is argued that the technology we use for writing has negative consequences in some respects, it does provide opportunities that

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make life easier. This study focuses on pre-service teachers' views on screen-based writing activities. Activities at a written expression course were used as the main starting point for this research. This study bears importance because today's students use screen-based writing in daily activities as well as in their coursework.

As a concept, technology has largely been associated with the physical sciences. However, technology has always had a social aspect (Childe, 2007; Diamond, 2006; cited in Yigit, 2013) and affects social life in various ways. Postman (2006) states that technology is both a friend and an enemy, and for this reason, emphasizes that the positive and negative aspects of technology should be jointly addressed. In this regard, the concepts of "technological optimism" and "technological pessimism" are used in the literature. As a balanced approach between these two concepts, the concept of "technorealism" was proposed in the late 1990's (Kabakci & Odabasi, 2004).

Attempts to take advantage of technology in schools and integrate it with educational content have recently gained great importance (Morrison, Ross & Lowther, 2009). Computers have become such an important part of our lives that the younger generations, in particular, cannot envision life without them. According to Kress (2003), following a long era of dominance, writing has been replaced by visuals, and books with screens.

Postman (2006) links the emergence of technology into the school to the emergence of printed texts. From this perspective, one could suppose that the emergence of digital texts would result in a new type of education. Today, we have a great deal of proof demonstrating that elementary school students have advanced digital technology skills (Blanchard & Moore, 2010; Lewis, 2009). As students receiving education in their mother tongues are natives to the digital age, it can be argued that computers are also a candidate to play an important role in language arts education.

Writing in Electronic Environments

In language arts, writing falls under the category of expression skills (Coskun, 2013). Students' skills in written expression play a significant role in their educational careers. Insufficient skills in this area may cause students to fall behind in their educational program and fail (Amundson & Weil, 2001). In this respect, developing written expression skills is not only an issue of importance in Turkish education, but also in all other educational areas. Gedizli (2006) stated that one of the primary goals of written expression courses was to develop the ability to benefit from writing and the writing culture based on the needs of today's world. It would be apt to utilize the opportunities of the technological age to develop students' written expression skills. Considering the fact that today's students have been exposed to digital environments rather than books and notebooks makes the issue even more vital.

Today, nearly everyone can access closed source (e.g., Microsoft Office©) or open source (e.g., Open Office©) word processing programs (Jelderks, 2012). These and similar programs provide great opportunities for computer users when it comes to writing. The new technological writing tools are quite different from traditional reading-writing technologies (pencil, book, chalk, etc.) (Grabill & Hicks, 2005; Jewitt, 2005; Merchant, 2003, 2005, 2007; Tuzel, 2013; Yost, 2000). Computers have brought about significant changes to the traditional concept of writing (Ferris, 2002). However, computers are not tools for writing alone, and with the additional services they offer, they can change the writing process, products and context.

With recent changes to the structure of communication tools, we have seen that the act of writing in the electronic environment has become increasingly differentiated from traditional writing (Tuzel & Tok, 2013). In fact, while all relevant writing technologies suffice for the act of

writing itself, only some have a striking social effect (Grabill & Hicks, 2005). Such effects are enabled when writing composed in electronic environments is delivered to the masses through either print and distribution or online sharing. The recent development and proliferation of social media has strengthened these effects (Tok & Kucuk, 2014).

Printed texts and computers are among the primary tools used in education (Van Manen & Adams, 2009). In the initial period of computer technology development, the Instructional Technology Committee of the National Council of English Teachers emphasized that computers could be an important resource for teaching writing processes (Thomas, 1985). Since the time when computers first started to be used for writing, various studies have been conducted on developing digital writing skills. Some of these studies were carried out within the scope of the National Writing Project (NWP), which was implemented in 1974. In these studies, the focus has been on writing practices in electronic environments (www.nwp.org). The Center for Research on Writing in Digital Environments (WIDE) founded at Michigan State University in 2003 has also produced significant research on this subject. WIDE focuses on research related to digital writing and online writing (Grabill, 2005). In their evaluation of the study results, Grabill and colleagues (2010) exerted that some students have developed sophisticated rhetorical and literacy skills through these environments. They further explained that only focusing on the classroom use of such environments would undermine the importance of the issue. They further suggested that researchers and teachers could benefit immensely from a deeper focus on how students might integrate the use of such sites and practices into their daily lives.

Additionally, Santos and Leahy (2014) suggested that writing for the real world and online communities should not be such different practices. They employed a post-pedagogical model for English writing class and concluded that what is labeled as valuable in students' writing depends on the community's definition of valuable. They further noted, "In the act of building an audience, students not only pursue popularity, but also play an active role in establishing the standards by which their writing is to be assessed" (p. 92). Dyehouse, Pennell and Shamoon (2009) consider an electronic writing environment as an opportunity to improve writing programs. They specifically noted, "Teaching writing in electronic environments also means encouraging our students to conceive of better spaces for the kinds of digital writing that they—and others—might eventually want to practice" (p. 330).

In his analysis of the National Digital Literacy Narrative Project (NDLN), Bradbury (2014) focused on the detailed experiences of three students in digital writing environments. He noted that all three students agreed on the invaluable benefits of the project for their writing practices using environments in which they had no previous experiences. He focused on the benefits of analyzing public rhetoric on technology and its impact on literacy practices. Participants commented that they learned how to use the technology together, and that writing while using the visual materials and connecting with others provided infinite possibilities. Bradbury suggested that teachers should explore their computer pedagogies to support better student learning. He agreed with Selber (2004) and suggested that educators needed to "incorporate even more opportunities for students and teachers to recognize computer literacy as a 'social practice' and to elevate our discussions beyond why and how to use technology to teach literacy" (p. 66). Thus digital writing has become an important aspect in the teaching and learning processes of today. Students and teachers should explore ways to incorporate such practices in the educational environments.

According to Burnett and Myers (2006), screen-based texts can easily be changed and used, and such editions can have a greater impact on writers' textual experiences. Writing on a screen not only includes words, but also images, videos, links, sounds and animations. It involves

different physical relationships with the text. It leads writers to an awareness of the visual effect of their work. It unites the relationship among screen, keyboard and mouse, and the appearance of the text onscreen makes it easier to present the work for others' comments.

Students' interactions among themselves and with the teacher are significant issues in the process of writing education. In computer-supported writing education, students can easily access what their peers are writing by viewing the texts onscreen or printing them, state their opinions, discuss each other's writings, and receive and provide feedback (Montague, 1990). All these interactions can make valuable contributions in terms of creating an effective writing environment.

Aim of the Study

This study aimed to reveal pre-service teachers' views on a screen-based writing course that they attended and the methodology used. The following research questions were posed in connection to this aim:

a. What are pre-service teachers' views on the advantages of screen-based writing instruction practices?

b. What are pre-service teachers' views on the disadvantages of screen-based writing instruction practices?

c. What are pre-service teachers' views on the process of screen-based writing instruction?

Method

Research Design

The present study employed a holistic single-case design, one of the qualitative case study designs. In case studies, the focus is on a limited system that is to be examined and described (Merriam, 2013). In holistic single-case design, there is only one unit of analysis (Yildirim & Simsek, 2014). As this study aimed to reveal the post-implementation views of pre-service teachers who received screen-based writing instruction in the courses Written Expression I and II, it was decided that the holistic single-case design would be most suitable.

Participants

The study was conducted with the participation of 62 pre-service teachers studying in two different classes at Canakkale Onsekiz Mart University. The participants consisted of 34 female and 28 male first year students majoring in Turkish language education. A typical case sample is a type of purposeful sampling, and this was used in the selection of participants. In typical case sampling, when introducing a new application or innovation, typical cases are selected from the environment where the novelty is introduced or the application is conducted (Yildirim & Simsek, 2014). Therefore, the sample consisted of pre-service teachers who received screen-based writing instruction.

The data was gathered over two semesters with two groups of students. Thus participant triangulation as well as time triangulation was used to improve trustworthiness. According to Cresswell (1998), there are eight verification techniques: (1) prolonged engagement and persistent observation, (2) triangulation, (3) peer review or debriefing, (4) negative case analysis, (5) research bias clarification, (6) member checks, (7) rich and thick descriptions, and (8) external audits. Additionally Cresswell (1998) noted that a researcher should use at least two of these procedures in a given study. This study employed four of these techniques, which are emphasized in italics (Items 1, 2, 6, and 7). While rich and thick descriptions refer to

transferability, prolonged engagement, triangulation and member checks deal with the issue of credibility. Triangulation can be accomplished in various ways. One of these is data triangulation, that includes (a) time triangulation, exploring chronological influences by longitudinal and cross-sectional designs; (b) space triangulation, using two or more settings as the research focus (becomes comparative); and (c) person triangulation, using different groups or individuals in gathering data. This study used two groups of students over a years' time and member checks were conducted to improve credibility.

Instruments and Data Collection Process

The data was gathered via the use of short interviews along with an open- ended form to express their views on digital writing and courses incorporating digital writing practices. The interviews and the completion of the forms took place at the end of the courses for both groups. Thus, students were given a chance to see the full advantages or disadvantages of digital writing activities. A total of 62 pre-service teachers completed the form. Short interviews took place after the class and lasted approximately five to ten minutes for each participant.

Data Analysis

The forms and interview notes were transferred into electronic texts and analyzed using content analysis. In content analysis, themes are formed based on the data collected. The content analysis technique requires coding the data and grouping codes with similar characteristics under categories or themes organizing and subsequently interpreting these themes in a way that is easy for the readers to understand (Yildirim & Simsek, 2014). In the study, the forms were completed by the pre-service teachers after the course and the interview data were examined in-depth. Themes were formed based on various patterns and links, and interpretations were made accordingly.

Findings

Findings and Interpretation Related to the Advantages of Screen-Based Writing Instruction

As a result of analyzing the pre-service teachers' views on the advantages of screen-based writing instruction, 11 categories were revealed. These categories are presented in Table 1 together with their frequency values.

Table 1. *Advantages of screen-based writing instruction*

Categories	***f***
Shareability	33
Practicality	26
Being Economic	23
Computer skills development	20
Future usability	18
Seeing spelling mistakes	16
Saving time	15
Writing in an orderly/grammatical manner	9
Writing legibly	5
Motivation to write	3
Physical ease	2

Shareability

According to the results obtained based on the pre-service teachers' views, shareability (*f*=33) ranked first among the identified advantage for screen-based writing instruction. The pre-service teachers expressed positive views about the fact that their own writing and that of others could be discussed and analyzed by using a projector in the classroom. Some of their views are indicated below:

> *The courses taught through computers is more suitable. In this way, we can better see our mistakes. Since we are open to any kind of criticism, we can produce better work when we rewrite. I believe that the reflection method is more successful in the course. (S33)*
>
> *It enables us to analyze the texts in the classroom. Everybody can see and make comments on what is written. This helps us to develop ourselves. (S36)*
>
> *You can share what you write with a large group with computer assistance. There is an opportunity to hold discussions with the entire group. I believe it is beneficial when my writing is shown [in this manner]. (S37)*

One of the aspects of a digital environment that comes to the fore is that it provides an opportunity to share. In this regard, the participants also attached great importance to the sharing of their written works. Using a digital environment enabled them to see their strengths and errors as well as those of others, and they were able to better develop their writing skills.

Practicality

According to the pre-service teachers' views, the practicality feature of computer-based writing instruction was ranked second, with a frequency of 26. The participants stated that the features that made their work easier provided practicality. Some of the pre-service teachers' views on this issue are as follows:

> *In this way, editions can be completed more quickly and easily. (S28)*
>
> *Screen-based writing is easier and more fluent for us. (S34)*
>
> *I say that processing texts on computers is more suitable in terms of the ease of deleting what you write, storing information, and reaching a larger group. (S57)*

In the active lifestyle of today's world, people are usually interested in practical solutions that make life easier. The reason for the high rate of preference for screen-based instruction could be that it provides significant practicality and facilitates the writing process.

Being Economic.

The feature of being economic (*f* = 23) was in third place among the participants views on the advantages of screen-based writing instruction. Issues such as "time-saving" and "preventing paper waste" were stated. Some pre-service teachers' comments are indicated below:

> *The positive features include not wasting paper, and it is easy to store files. (S13)*
>
> *It's cliché to say it, but no trees are harmed. (S19)*
>
> *In this way, we prevent the waste of paper. (S33)*

It is understood that most of the participants, as natives of the digital age, regarded the usage of pen and paper as wasteful. For them, digital environments have economical features in terms of both materials and storage.

Computer Skills Development.

Positive advantages cited also included the development of computer skills, with a frequency value of 20. Specifically, the pre-service teachers stated that they learned various features of word processing programs that they did not know about, noting that this was quite beneficial for them. In addition, there were participants who asserted that such features developed their general computer use skills. The views of pre-service teachers regarding the development of computer skills include the following:

> *In this course, I learned the programs that are necessary for writing on a computer. (S44)*
>
> *Before taking this course, I didn't know how to write on a Word document. I learned many things by doing and trying here. (S39)*
>
> *One of the advantages is that those who don't know how to use Word learned it in the class. (S21)*

Apparently, most pre-service teachers did not know about the features included in the Word program. As they exposed to these advantages, they were more inclined to prefer screen-based writing. It was observed that most of the participants who did not know how to use such computer programs, learned many features during this course.

Future Usability.

Almost one-third of the pre-service teachers (f=18) stated that they could use screen-based writing in their professional lives. Some of the participant views related to this category include:

> *I think adapting to today's world of technology will be useful for us when we start the teaching profession in the future. (S1)*
>
> *It is a great advantage that most work is now done in a computer environment, and we prepare for this in our education. (S30)*
>
> *Learning how to use Word here is an advantage since it will be necessary for us in our future lives. We not only receive writing instruction, but also learn the program. This is beneficial for us. (S61)*

One of the aims of providing technology-supported education to pre-service teachers is to enable them to make use of these technologies in their classrooms when they become teachers. From this perspective, it is noteworthy that 18 pre-service teachers stated they would adopt this implementation in their future teaching.

Seeing Spelling Mistakes.

One of the areas in which pre-service teachers' encounter difficulty is spelling rules. Although there are certain rules, memorizing them along with some exceptions is a point of difficulty for many students. According to the participants' views, one advantage of screen-based writing instruction was being able to see their spelling errors. The reason is that most word processing programs have features such as underlining and highlighting misspellings. The following statements were provided by the pre-service teachers regarding this issue:

> *We can easily notice spelling mistakes and correct them. (S20)*
>
> *We learned to conduct a better evaluation of writing, which usages are wrong, and what shouldn't be used. (S12)*
>
> *Enabling us to easily notice grammar mistakes is among the advantages. (S25)*

While writing in electronic environments, pre-service teachers can avoid spelling mistakes that they might otherwise overlook. Therefore, they did not encounter any problems with this application and also learn the correct spellings.

Saving Time

Some of the pre-service teachers (f=15) indicated that writing on a computer saved time. Examples of the pre-service teachers' views include the following:

> *It is astute to prefer a computer because it saves time. (S18)*
>
> *Instead of starting from scratch when we make a spelling mistake on paper, we use the delete key and don't lose much time. (S19)*
>
> *Since the age requires electronic environments, it is easier and faster to write on a computer. It saves time. (S44)*

One of the characteristics of digital natives is that they become easily bored with what they are doing. The time that digital environments save in terms of writing is appealing to them.

Writing in an Orderly/Grammatical Manner

One important advantage of word processing programs is that page layout can be organized as desired. Nine of the pre-service teachers indicated this advantage with the following statements:

> *We can write in a more orderly fashion while creating a text on a computer. (S23)*
>
> *The ease at which you can set text, font, and page organization is an advantage. (S26)*
>
> *I learned how to embellish the appearance of text. I started to be more careful about details such as centering the text, line spacing, and text fonts. (S39)*

With the various tools in word processing programs, it is possible to create the desired order and shape of the text. This is a convenience for pre-service teachers.

Writing Legibly

One of the problems that pre-service teachers face is students who do not write legibly as well as their own ability to write legibly. This is a difficulty for teachers who read student texts. Since standard characters are used in word processing programs, being legible is a prominent feature. Five of the pre-service teachers emphasized this particular issue. Given below are some examples of the participants' views:

> *Since I have difficulty writing properly, writing on a computer is more suitable for me. (S9)*
>
> *This resolves the problem of having a bad handwriting. (S42)*
>
> *I think that education should be computer-supported because writing on a computer is both easier and more orderly and legible. (S53)*

Those pre-service teachers, in particular, those with poor handwriting, preferred the standard writing style produced in a computer environment.

Motivation to Write

Three of the participants stated that screen-based writing motivated them to write and made them love writing. They stated the following:

> *With the computer-supported writing course, my concerns about writing disappeared. I started to love writing. (S32)*
>
> *I gained the habit of writing with computers. (S29)*
>
> *It helps us to focus our attention on the lesson. It motivates us. (S45)*

Motivation is one of the prominent elements of writing. In this sense, three of the pre-service teachers stated that writing in a computer environment motivated them to write.

Physical Ease

Two of the pre-service teachers said that screen-based writing reduced physical fatigue. They provided the following statements regarding this issue:

> *Although computer-supported writing is faster, it reduces physical tiredness. (S17)*
>
> *By this means, we develop writing on a computer and also our wrists don't hurt as they do when writing by hand. (S56)*

Digital environments provide physical ease in writing, as in many other areas. Two of the pre-service teachers pointed out this issue.

Findings and Interpretations Related to the Disadvantages of Screen-Based Writing Instruction

Nine categories were revealed based on the participants' views on the disadvantages of screen-based writing instruction. According to the results, the advantages of screen-based writing instruction outnumbered the disadvantages. While some participants stated that there were no disadvantages, some indicated more than one disadvantage. The nine categories and their frequency values are presented in Table 2.

Table 2. *Disadvantages of screen-based writing instruction*

Categories	***f***
Problem of obtaining a computer	16
Adaptation problem	12
Technical problems	10
Health problems	6
Receiving negative criticism	6
Disappearance of paper culture	3
Loss of attention	2
Perceiving its applicability as low	2
Plagiarism	1

Problem of Obtaining a Computer

Some of the pre-service teachers (*f*=16) stated that they had difficulty in obtaining personal laptop computers, while some verbalized this problem on behalf of their friends. The fact that this study was conducted at a state university with a student demographic of a medium socioeconomic level can be seen as the reason for this situation. Participants' views include the following:

> *For me, the disadvantage was that I didn't have a computer. So I had some difficulty, but I handled it anyway. Besides that, it didn't have any disadvantages. (S2)*
>
> *There was a problem for those who don't have a computer and Word. (S14)*
>
> *I think the only disadvantage was the difficulties that our friends who didn't have a computer experienced. Apart from that, there seems to be no disadvantage. (S47)*

Some of the pre-service teachers who participated in the course without owning a computer said that it negatively affected them.

Adaptation Problem

Twelve pre-service teachers stated that they had difficulty in adapting to the implementation. Some participant indicated the following:

> *I can't say there are no difficulties. There are things that I can't do since I don't know them very well. (S19)*
>
> *Not everybody's computer competency is the same. Some of the students may have more difficulty in adapting to the computer. (S39)*
>
> *Since we don't have a good command of computers, we make many mistakes. It is a little bothersome that others see our mistakes in the classroom. (S57)*

Some of the pre-service teachers that had no previous familiarity with screen-based writing activities were observed to have adaptation problems. This can be due to fact that their computer skills were not at a sufficient level.

Technical Problems.

Ten of the pre-service teachers identified technical problems as the top issue they experienced in screen-based writing instruction. Some of their views are indicated below:

> *As a negative side, I can only mention the problems due to some programs. (S13)*
>
> *When there was an electrical problem, the lessons were disrupted. (S26)*
>
> *Sometime there are technical problems that don't have anything to do with us. What we write does not show up or can be deleted. (S35)*

One of the common issues encountered with electronic devices is technical problems. Such problems are also experienced while using computers. Examples of these problems include electricity outages/running out of battery power, and problems due to the computer processor and software programs.

Health Problems

Electronic devices are known to cause various health problems. In this regard, it is possible that depending on the context and conditions, some health problems can be experienced in studies conducted with computers. Examples of health problems that some of the pre-service teachers (*f*=6) stated that they had are provided below:

> *It is harmful to be exposed to the light of a computer screen for a long time. Our eyes get tired quickly. (S7)*
>
> *It causes physical tiredness. Especially in the eyes. (S15)*
>
> *It is not good for us to be exposed to radiation while studying. (S59)*

Some of the pre-service teachers encountered health issues in the process of screen-based writing instruction. Various arrangements, such as the usage of screensavers and devices that reduce radiation, can be arranged to prevent these problems.

Receiving Negative Criticism

In the course, samples from the texts written by the pre-service teachers in a computer environment were projected using a projector, allowing the faculty member and all the students to critique the texts. This aimed to help the pre-service teachers produce better work by seeing their weaknesses and strengths. However, some of the pre-service teachers (*f*=6) stated that they did not feel comfortable receiving negative criticism. Some of the statements on this issue are:

> *The disadvantage is that our writings were subjected to criticism, and as a result of this, I tried to be perfect, and felt weary of writing when unable to accomplish this. (S25)*
>
> *I don't really like my writing being read by everybody and criticized. (S43)*
>
> *Those who are not open to criticism can be hurt. (S54)*

Since there is a work that is produced and shared, there will certainly be criticism. The fact that some pre-service teachers were not open to criticism brings up the possibility that they had not been criticized much, or had previously received only positive feedback. It is important for pre-service teachers to receive criticism and for their work to be evaluated to normalize this situation.

Disappearance of Paper Culture

Three pre-service teachers indicated that the use of current technology in writing instruction weakened and destroyed the traditional paper-based culture. Below are the statements of these participants:

> *Computers keep us away from paper. Being into technology may weaken our old values. Of course, it has advantages, but these disadvantages should not be underestimated. (S5)*
>
> *I think it would be better if we wrote on paper. People may not convey exactly what they think on a computer. Paper has a unique place. It is not appropriate to abandon it for good. (S29)*
>
> *Its disadvantage is attaching secondary importance to pen and paper. However, we think of pen and paper when it comes to writing. (S30)*

As technology entered human life very quickly in the last century, it also caused old technologies and traditional structures to disappear. Some of the pre-service teachers emphasized these values.

Loss of Attention

Two participants stated that screen-based writing led to loss of attention. Their views related to this issue are as follows:

> *Going on the Internet while writing distracts me. (S7)*
>
> *I can experience distraction problems during the lesson. (S18)*

The multi-functional aspect of the computer environment may cause users to be distracted by something while doing something else. Some of the pre-service teachers were affected by this situation.

Perceiving its Applicability as Low

Two of the pre-service teachers expressed that while they had positive views about the course, they believed that they would not have a chance to replicate this implementation. Their views are as follows:

> *Teaching with computer support is a good practice to adapt to the times. It is a positive development for us to be into technology. However, when we start the profession, we will have to provide paper-based writing instruction. (S16)*
>
> *This implementation is good, but we won't have the facilities to teach writing like this in the future. (S50)*

Because some pre-service teachers thought that they would not have the facilities necessary to implement this process in their professional lives, they see the possibility of using this practice in the future as low.

Plagiarism

Access to the Internet has brought about many challenges. One of the results of such problems in education is plagiarism. One of the participants pointed out this particular problem:

> *Unfortunately, using computers can yield texts that are merely copied and pasted. (S46)*

It is known that some pre-service teachers try to present texts that are produced by using the "cut/copy-paste" features as their own works. In this regard, plagiarism detection programs might present a solution.

Findings Related to the Screen-Based Writing Instruction Process

In the open-ended surveys, participants were asked to state their opinions on whether the screen-based writing instruction should continue. A majority of the 62 participants (f=48) said the writing instruction should continue as screen-based. While ten participants preferred to be taught using a paper-based approach, four participants stated that such courses should be both paper and screen-based. The frequencies are presented in Table 3.

Table 3. *Views related to the screen-based writing instruction process*

Categories	***f***
Those preferring screen-based writing instruction	448
Those preferring paper-based writing instruction	110
Those preferring that paper and screen-based writing instruction be combined	44

Those Preferring Screen-based Writing Instruction

In the following section, some examples from the views of participants stating that the screen-based implementation should continue are provided:

> *For writing, the computer environment is more suitable. It has more advantages in terms of time and speed. We also see and read what our friends have written. We couldn't see many examples if it was on paper. The computer environment yields more positive results for sharing texts academically or in any other fields. (S22)*

> *I think that it is more suitable if the course is taught through computers. If what we learn only stays on paper, we would have received an outdated instruction, and it is possible that we would be in a difficult position against our target crowd. (S26)*

> *With the computer writing course, my concerns about writing disappeared. I started to love writing. The course should be given in a computer-based manner. (S32)*

> *I think this course should be computer-based because writing on a computer is both easier and more orderly and legible. After all, the age is the technology age. We should get the most out of the benefits of technology. (S53)*

As a result of the study, most participants (77.4%) stated that the screen-based writing instruction should continue. The aspect of screen-based writing that the pre-service teachers generally found positive was its sharing dimension. Additionally, they also viewed screen-based writing instruction as a method suitable to the conditions of the age.

Those Preferring Paper-based Writing Instruction

Ten of the pre-service teachers stated that writing instruction should continue in a paper-based manner. Given below are examples from the statements of such pre-service teachers:

> *It should be continued on paper. However practical computers are, there are students in the class who don't have a computer or have a faulty one. (S12)*

> *For me, using paper feels like we write something, drop a line. Writing down my thoughts on paper speeds up my writing process. (S3)*
>
> *I would prefer writing on paper since I normally prefer paper. However, writing on a computer is easier. (S34)*
>
> *The joy of writing on paper is something unique. Personally, I write on paper before I write on a computer. However, not everyone could have seen the texts if they were on paper. (S48)*

The reason for some of the pre-service teachers preferring paper-based writing could be computer-related problems. In general, the pre-service teachers also expressed that computer-based writing instruction had advantages in different ways.

Those Preferring a Combination of Paper and Screen-based Writing Instruction

Only four participants preferred a writing instruction methodology in which paper and screen-based writing were combined. The statements of these participants include the following:

> *Although it is suitable to teach in a computer-based manner, it would be better to do so in conjunction with paper-based writing. (S1)*
>
> *A computer is very good for reflection. Because you understand better both visually and orally. However, I know that those without a computer had difficulty. It would be better if both of them were possible. (S15)*
>
> *I think writing instruction in which both paper and computers were used could be better. (S20)*
>
> *Both can be used together. It is easier to show written work in a computer environment; that's why I say computer. There can be technical problems; that's why I say paper. But again I say computer in terms of the ease of deleting text and of storage, and also sharing with large groups. (S37)*

Only a small number of pre-service teachers expressed that both paper and screen-based writing could be implemented together.

Discussion, Results and Recommendations

Discussions arguing that digital screens are gaining more importance and fulfilling more functions have been expanding (Livingstone, 2002). Grabill (2005) points out the importance for all writing teachers to use various information technologies such as computers. Considering the present study, it can be argued that 77.4% of the participants held the same view.

Digital literacy is a concept that has come to the fore in today's educational world. It is understood from the pre-service teachers' statements that screen-based writing instruction has made a positive contribution to their digital literacy skills. The views of those who preferred screen-based writing instruction can be summarized as "adapting to the conditions of the age" and "making use of the benefits of technology".

One indispensable stage in the writing process is evaluation. It is more useful in terms of appraisal for written works to be evaluated by many people. One of the most important stages of the practices in the National Writing Project (NWP) was having students share what they wrote (Liebermann & Wood, 2003). In this study, the pre-service teachers ranked sharing their written works (*f*=33) at the top of the list of positive features, consistent with NWP practices. In addition, Tuzel and Tok's study (2013) indicated that sharing the writing in a digital environment was among the top positive features of digital writing. This result is also consistent with the results of this study.

Graham and Perin (2007) state that writing can be used as a tool to teach the contents of written materials. In this sense, one of the prominent study results is that nearly one-third of the pre-service teachers (f=20) stated that their computer skills had been further developed as

a result of this implementation. Morrison, Ross and Lowther (2009) conducted a study using a mixed method in a high school for three years. Each student was provided with a personal laptop computer and wireless Internet access for 24 hours. The NTeQ model developed by Morrison and Lowther (2005) and based on teaching with personal laptop computers was used in the study. The study results included an observable development in the pre-service teachers' computer skills as well as their writing skills.

The Ministry of National Education determined one of the five skills included in the elective course, Writing Skills, to be "making use of the benefits of technology in writing". These skills taught as an elective course in middle schools as of 2012 were seen as an important need at the undergraduate level in this study. Furthermore, considering that the participants were pre-service teachers, it can be argued that they went through an important implementation in terms of the teaching process.

As a result of his study at a US school, Norris (2012) recommends a hybrid model of writing instruction incorporating both paper-based and digital technologies. In the current study, a small number of pre-service teachers (*f*=4) were found to prefer both paper and screen-based writing instruction; however, the majority of participants preferred digital or screen based writing exclusively. Thus this study produced different results from Norris's findings and extends the use of digital writing as a major technique for use in classroom activities.

Gogus (1978) emphasizes spelling education as an important step in written expression. He lists the correct spelling of words and spelling rules among the objectives of spelling education. As a result of the computer-supported writing instruction, 16 participants stated that screen-based writing reduced spelling mistakes, and five said that it enabled legible writing.

In his study on the digital technology usage of English teachers teaching writing, Razali (2013) points out the importance of organizing the course contents of writing instruction with the inclusion of technological elements. According to him, students who are digital natives are more inclined to write in electronic environments. A course environment in which technological tools are used would both motivate them and enable teachers, who are mostly digital immigrants, to renew themselves by learning these technologies. Furthermore, this study also supported the claims of Youngquist (2003) who investigated students' electronic writing skills, and claimed that technology, when integrated into writing classes, contributes to a better quality of work among students. Participants in this study also agreed that digital writing would help improve their writing skills, save time in writing, and share ideas. Paper waste and economically viability were additional findings in this study that most researchers did not address.

Today's technology can be used for positive purposes, although there are some negative aspects. Particularly, the significance of technological support in education has been the focus of many studies in the West. In this study, it was found that according to participants' views, the advantages of screen-based writing outnumber its disadvantages. It can be argued that the fact that a considerable number of the participants (*f*=48) preferred screen-based writing instruction, can be a starting point to explore and incorporate screen-based writing practices in various courses. Furthermore, the study supports the clams of other researchers that argue for a digital writing environment in instruction as well as in students' daily lives.

Based on the results of the study, students became more comfortable with digital-writing practices as they continued to use it. While this is a case study and generalizations based on pre-service teachers would not be appropriate, it is important to note that pre-service teachers in Turkish language education might benefit from the inclusion of such contents and activities

in their course work. As is the nature of case studies, more studies with various groups would help explore the issue better and provide a greater understanding.

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