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Digital Reading Attitudes of Pre-Service Teachers

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This study explored the attitudes of pre-service teachers of two different groups majoring in numerical and verbal fields towards digital reading in terms of different variables. By examining variables such as daily digital reading time, daily print reading time, number of books read from digital devices, the level of digital reading attitudes of pre-service teachers in numerical and verbal fields were examined and the findings are discussed. The survey model was used in the research. Participants were selected using the convenience sampling method, one of the non-random sampling methods, and consisted of 100 pre-service teachers, 56 of whom were majoring in Mathematics Education and 44 in Social Studies Education at a state university in Central Anatolia. The Attitude Scale towards Digital Reading for Pre-Service Teachers developed by Yurdakal and Susar Kırmızı (2021) was used as the data collection tool. The findings showed that although the digital reading attitudes of respondents showed statistically significant differences in their daily reading duration from printed sources, reading books from any kind of digital devices, digital reading competencies and the number of books they read in a year, there were no significant differences according to the program they were studying, daily digital reading duration and electronic text which can be read in an internet-free environment. In line with the results, some suggestions are provided for educators regarding digital reading which it is believed will improve the quality of education.

Keywords: Digital reading, screen reading, pre-service teacher, education, technology

INTRODUCTION

Thanks to the developing technologies in the last twenty years, screens have started to appear in every aspect of our lives. In order to benefit from the advantages of technology, it is necessary to use it correctly and appropriately (Kabakçı & Odabaşı, 2004). Traditional printed materials have begun to move to digital screens in this digital age in which screens are ubiquitous (Meyer, 2018). Today's middle- and high-school students, the digital natives of the swipe-pass age, tend to spend most of their time on digital screens, finding it boring to read from print. In today's world, where information is spreading rapidly, data collection, data processing, transformation of data into meaningful information and its use (Keskin et al., 2016), in short, the whole act of reading, continues to be performed on digital screens.

As the act of digital reading has become a daily practice, today's young readers have become proficient at reading digital texts as well as reading printed ones. However, there are international studies suggesting that there are cognitive differences between the process of digital reading (non-linear reading, hypertext and superficial reading) and the process of reading from printed sources (brain activation, contextual environment, cognitive focus, comprehension and reading speed) (Coiro & Dobler, 2007; Cull, 2011; Chen & Chen, 2014). While undertaking digital reading, the complexity of capturing conceptual connections (RAND Reading Study Group, 2002) and the lack of in-depth reading and maintaining interaction (Carr, 2010; Liu, 2005; Wolf et al., 2009) can surface.

In terms of learning environments, students' access to digital materials increased as a result of the widespread use of current technologies (Gil-Flores et al., 2012). This has led to the emergence of significant differences between the teacher and the student, who are in the same classroom but are from two different generations, and this has become an obstacle for teachers and students who should speak the same language (Bilgiç et al., 2011). At the forefront of the factors which negatively or positively affect the outputs of the process described above are the attitudes of teachers and teacher candidates (Yurdakal & Susar Kırmızı, 2021). Because students are just one click away from accessing complex information, teachers' attitudes towards digital reading, or in other words, towards reading from the screen, have also become important. From this point of view, it is important that the attitudes of students who are training to be teachers, that is, today's teacher candidates, are positive since they will then perform digital reading with awareness and conscious understanding and will be role models for their future students (Yurdakal & Susar Kırmızı, 2021). On the other hand, it is possible that teacher candidates' negative attitudes will lead to many negative consequences such as not only leaving their students stranded with false information in the digital world in the future, but also causing them to lose control of the teaching/learning process.

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It can be predicted that the unconscious shift of elementary and middle-school students' reading activities from printed to digital will lead to a negative development in digital literacy. Digital literacy, one of the literacy concepts introduced at the end of the twentieth century and developed at the beginning of the twenty-first century, refers to the ability to comprehend and use information presented by computers and obtained from a range of sources in more than one way (Gilster, 1997). Studies on the development and importance of digital literacy in the globalizing world have emphasized how the skills of understanding, critical thinking, retrieving, structuring and re-presenting information in digital readings should be improved (Çalışkan et al., 2023; Fu, 2013; Martin & Grudziecki, 2006; Reddy, Sharma & Chaudhary, 2020; Sarkar, 2012).

Students, who are digital natives, can research the accuracy of the information they read on the screen, access reliable information, use the information which they obtain, and share it by creating new information, and all this indicates a high level of digital literacy. However, it should not be forgotten that students' having high digital literacy levels depends on teachers developing the specific skills to support their learning. Çalışkan and Asan (2023) stressed that since skills cannot be developed in a few teaching periods, the task which teachers have to undertake should be integrated into the whole teaching process rather than just being a subject in particular lessons. This could be effective in the development of digital literacy skills.

Teachers should have positive attitudes towards digital reading in order to develop digital literacy skills in their students (Tor et al., 2022). It is predicted that teachers who have negative attitudes towards digital reading will have shortcomings in understanding the importance of digital literacy skills. It is therefore likely that the level of digital literacy skill development, one of the significant skills today, will slow down. In order to prevent this, it is important to examine the current situation of teacher candidates who are expected to have a positive attitude towards digital reading in their professional life.

In the national and international literature, there are many studies of digital reading (for example, Liu, 2012; Rowsell & Burke, 2009; Coiro, 2021; Chen & Chen, 2014; Odabaş et al., 2018; Keskin et al., 2016; Odabaş, 2017; Yıldız & Keskin, 2016). These studies focused on digital reading and different topics regarding digital reading. However, no studies exploring digital reading in terms of pre-service teachers were found. In examining the digital reading attitudes of pre-service teachers, the present study is original and important owing to the fact that it will fill the noticeable gap in the national and international literature, suggest future scientific studies and present practical recommendations.

The findings make it possible to draw inferences about how pre-service teachers will follow a path towards digital reading when they become teachers by focusing on their digital reading attitudes. Furthermore, considering that the pre-service teachers participating in the study were selected specifically to explore differences between the verbal and numerical fields, factors such as whether the two different academic departments in which the participants were studying cause a difference between their digital reading attitudes constitute the problem addressed by the study.

Purpose

The sub-problems of the study examining the digital reading attitudes of pre-service teachers were framed around the following questions focused on the objectives and problem stated above:

1. Do the digital reading attitudes of pre-service teachers differ according to the department they are in?
2. Do the digital reading attitudes of pre-service teachers differ according to their daily digital reading duration?
3. Do the digital reading attitudes of pre-service teachers differ according to their daily print reading duration?
4. Do the digital reading attitudes of pre-service teachers differ according to their status of reading books from digital devices?
5. Do the digital reading attitudes of pre-service teachers differ according to their defined competence levels?
6. Do the digital reading attitudes of pre-service teachers differ according to the availability of electronic texts which they can read when there is no internet access?
7. Do the digital reading attitudes of pre-service teachers differ according to the number of books they read from digital devices in a year?
8. Do pre-service teachers prefer to read from print or a digital device?

METHOD

Study Model

In order to examine the digital reading attitudes of pre-service teachers, the study employed the survey model, one of the research designs used for quantitatively identifying the trends, attitudes and thoughts in a population or examining the relationships between variables in the sample (Creswell & Creswell, 2021).

Participants

Demographic characteristics of the participants are presented in Table 1.

Table 1. Participants' demographic characteristics

Demographic Characteristics		f	%
Gender	Female	72	72.0
	Male	28	28.0
Program	Mathematics Education	56	56.0
	Social Studies Education	44	44.0
	Total	100	100.0

As Table 1 shows, 72% of the pre-service teachers participating in the study were female and 28% were male. Also, 56% of the participants were majoring in Mathematics Education and 44% in Social Studies Education.

Data Collection Tools

The Attitude Scale towards Digital Reading for Pre-Service Teachers developed by Yurdakal and Susar Kırmızı (2021) was used to collect data for the study. This thirty-one-item, five-point, Likert-type scale has two sub-dimensions, Digital Reading Preferences and Characteristics of Digital Reading, and ten reverse items. The Cronbach's alpha reliability coefficient for the total scale was found to be 0.956, and each question was scored between 1 and 5. The highest score which can be obtained is 155 and the lowest is 31. A score between 31 and 72 indicates a low attitude, a score between 73 and 114 indicates a medium attitude and a score between 115 and 155 indicates a high attitude (Yurdakal & Susar Kırmızı, 2021).

The evaluation range of the scores which can be obtained from the data collection tool is presented in Table 2.

Table 2. Evaluation range of the items in the data collection tool

Statements	Value	Limits
Strongly Agree	1	1.00-1.80
Disagree	2	1.81-2.60
Undecided	3	2.61-3.40
Agree	4	3.41-4.20
Strongly Agree	5	4.21-5.00

As Table 2 shows, if the mean score obtained from the scale items is high, it can be said that the participant has a positive digital reading attitude and if it is low, it can be said that the participant has a negative digital reading attitude.

Data Analysis

For the analysis of the data, a normality analysis was performed to decide which methods to use. First, the arithmetical means of the data were calculated and the mode, median, skewness and kurtosis values were determined. The results showed that the data had a value very close to normal distribution. They were then checked using a normality test.

The mean of the attitude scores obtained from the scale was 3.23, the median was 3.25 and the mode was 3.23. The skewness value was calculated as .057 and the kurtosis value as .001. In calculations of normality, skewness and kurtosis values between -1 and +1 are strong evidence of the data showing a distribution close to normal (Huck, 2012). Since the study data showed a normal distribution, parametric tests were performed.

FINDINGS

In this section, in line with the purposes of the study, the quantitative findings obtained from the responses provided by the pre-service teachers to the Attitude Scale towards Digital Reading for Pre-Service Teachers and the Personal Information Form are presented.

Table 3. Results of the independent sample t-test regarding the digital reading attitudes of the pre-service teachers according to the programs which they were studying

Participants' Program	N	$\overline{X}$	ss	t	sd	p
Mathematics Education	56	3.21	.28	-.920	98	.360
Social Studies Education	44	3.26	.24			

As Table 3 shows, the mean of the attitude scores of the students in Mathematics Education was $\overline{x}$=3.21 and that of the students in Social Studies Education was $\overline{x}$=3.26. The t-test analysis therefore showed no statistically significant difference between the participants' digital reading attitudes according to the program which they were studying (p>.05).

Table 4. Results of the independent sample t-test regarding the digital reading attitudes of the pre-service teachers according to their daily digital reading duration

Daily Digital Reading Duration	N	$\overline{X}$	ss	t	sd	p
Little (0-120 min.)	58	3.25	.27	.637	98	.526
A lot (121-600 min.)	42	3.21	.25			

As Table 4 shows, the mean of the attitude scores of the participants with a low daily digital reading duration was $\overline{x}$=3.25 and that of the participants with a high daily digital reading duration was $\overline{x}$=3.21. The t-test analysis therefore showed no statistically significant difference between their digital reading attitudes according to their daily digital reading durations (p>.05).

Table 5. Results of the independent sample t-test regarding the digital reading attitudes of the pre-service teachers according to their daily print reading duration

Daily Print Reading Duration	N	$\overline{X}$	ss	t	sd	p
Little (0-50 minutes)	67	3.19	.26	-2.140	98	.035*
A lot (51-240 minutes)	33	3.31	.24			

As Table 5 shows, there was a significant difference between the students' digital reading attitudes according to their daily print reading duration (p<.05). The attitudes of those whose daily print reading duration ranged between 51 and 240 minutes ($\overline{x}$=3.31) were higher than those of the students whose daily print reading duration ranged between 0 and 50 minutes ($\overline{x}$=3.19).

Table 6: Results of the independent sample t-test regarding the digital reading attitudes of the pre-service teachers according to their digital book reading status

Digital Book Reading	N	$\overline{X}$	ss	t	sd	p
Yes	41	3.36	.24	4.510	98	.000*
No	59	3.14	.24			

As Table 6 shows, 41 participants responded 'Yes' to the question 'Do you read books on any of the digital devices?' and 59 responded 'No'. This shows a significant difference between the attitude scores of the participants who read books on digital devices and those who did not (p<.05). Accordingly, the attitudes of the pre-service teachers who answered 'Yes' ($\overline{x}$=3.36) were higher than the attitudes of the pre-service teachers who answered 'No' ($\overline{x}$=3.14).

Table 7. Results of the independent sample t-test regarding the digital reading attitudes of the pre-service teachers according to their competency in digital book reading

Competency in Digital Book Reading	N	$\overline{X}$	ss	t	sd	p
Good	47	3.16	.24	-2.735	98	.007*
Bad	53	3.30	.26			

As Table 7 shows, 47 participants responded 'Good' to the question 'How would you describe your competency in reading on digital devices?' and 53 responded 'Bad'. This shows a significant difference between the attitude scores of the participants who defined their level of competency in reading on digital devices as good and the attitude scores of the participants who defined it as bad (p<.05). Accordingly, the attitudes of the pre-service teachers who responded 'Bad' ($\overline{x}$=3.30) were significantly higher than those who responded 'Good' ($\overline{x}$=3.30).

Table 8. Results of the independent sample t-test regarding the digital reading attitudes of the pre-service teachers according to their status of reading electronic texts when there is no internet

Reading Electronic Text when there is no Internet	N	$\overline{X}$	ss	t	sd	p
Yes	38	3.27	.26	1.092	98	.277
No	62	3.21	.26			

As Table 8 shows, 38 participants responded 'Yes' ($\overline{x}$=3.27) to the question 'Are there any electronic texts that you can read on your digital devices even when there is no internet?' and 62 responded 'No' ($\overline{x}$=3.21). The result of the t-test analysis therefore showed no statistically significant difference between the pre-service teachers' digital reading attitudes according to their status of reading electronic text in an environment without internet access (p>.05).

Table 9. Results of the ANOVA test regarding the digital reading attitudes of the pre-service teachers according to the number of books they read on digital devices in a year

Number of Books Read	N	$\overline{X}$	ss	f	p	Significance
0	40	3.13	.25			
1-9	27	3.25	.22	6.954	.002*	0 and 10-50 interval
10-50	33	3.34	.26			

Table 9 shows that there was a statistically significant difference between the two groups in their digital reading attitudes according to the number of books they read on digital devices in a year (p<.05). Those who read no books from digital devices in a year ($\overline{x}$=3.13) had significantly lower digital reading attitudes than those who read between 10 and 50 books ($\overline{x}$=3.34).

Table 10. Pre-Service teachers' reading environment preferences

Preference	f	%
Paper	96	96.0
Digital	4	4.0

As seen in Table 10, 96% of the participants preferred reading on paper and 4% on digital devices.

CONCLUSION and DISCUSSION

In this study, 100 pre-service teachers' digital reading attitudes were examined in terms of different variables such as the academic program they were in, their daily digital and print reading duration and the number of books they read in a year. The findings showed that their digital reading attitudes had a statistically significant difference according to their daily print reading duration, their status of reading books on any digital device, their digital reading competency, and the number of books they read in a year. However, there were no significant differences according to the program they were in, their daily digital reading duration and their status of reading electronic texts when there is no internet access.

Independent sample t-tests were performed to examine whether the digital reading attitudes of the students differed according to the program they were in. The analysis showed no significant difference in the digital reading attitudes of the participants according to the academic program they were in. Şahenk Erkan et al. (2015), however, found a significant difference in their participants' digital reading habits according to the programs they were majoring in, so their findings are contrary to the findings of the present study. In the present study, there was no difference in the attitude scores of the pre-service teachers from verbal and numerical fields of study, whereas Şahenk Erkan et al. (2015) had compared pre-service teachers studying Turkish Language Education and Pre-school Education and found a significant difference in favor of the participants majoring in Turkish Language Education.

In terms of the effect of their daily digital reading duration on digital reading attitudes, there was no statistically significant difference between the attitude scores of the participants who had 'little' reading duration and the participants who had 'a lot' ($\overline{x}$=3.21) (p>.05). Accordingly, the participants' daily digital reading duration had no effect on their attitudes. However, this was not the same situation when their print reading durations were explored. As a matter of fact, the digital reading attitudes of the participants increased as their daily print reading duration increased. These findings are not in line with the results of the studies in the national and international literature. For instance, Dağtaş (2013) reported that the majority of the participants stated that reading from a printed text was easier, more permanent and contributed to the reading

process at a higher rate, and along the same lines, they expressed a negative view on their preference for reading from a screen. Furthermore, Kurata et al. (2016) determined that most of their participants preferred to read from printed materials, although their source used for reading varied according to their purpose of reading. Even if their purpose of reading was to browse, read for fun or look at the news, reading from a digital device was a limited choice, and most of the participants approached reading from print positively.

The examination of another variable, reading a book on any digital device, produced a statistical significance. The findings showed that the attitudes of the pre-service teachers who read books on any digital device were significantly higher than those who did not. This could be explained by the fact that the pre-service teachers who exhibited a positive attitude had experience in this regard. No previous studies have explored the effect of pre-service teachers' digital reading status on their attitudes or whether a similar variable changes their tendencies towards screen reading.

A statistical significance was found when the participants' attitudes were analysed according to their perceived competency in digital reading. The underlying reasons for the positive attitude of those who defined their digital reading competency as low could have been their belief that they could improve themselves if there is a need to do so even if they do not see themselves as at a sufficient level in digital reading. However, since the education sector is the most fundamental factor in the development of digital reading practice and reading literacy in order to catch up with generation Z (OECD, 2016), studies should be carried out to identify ways to increase the reading competency of pre-service teachers to a high level (Amiama-Espaillat & Mayor-Ruiz, 2017).

No significant difference was determined between the attitudes of the pre-service teachers who had electronic texts which they could read on their digital devices even when there was no internet access and those of participants who did not have electronic texts which they could read on their digital devices regardless of internet access. Although it was expected by the researchers that the attitudes of pre-service teachers who had electronic texts which they could read in cases of no internet access would show a positive significance, no statistical difference was found regarding this variable. The participants did not show a significant positive digital reading attitude even if they had electronic texts in environments where there was no access to the internet. There are similar findings reported in the literature. For instance, Odabaş et al. (2018) found that their participants preferred printed sources to digital sources even if they read digitally.

Finally, regarding the reading environment preferences of the pre-service teachers, 96% of them preferred reading from printed sources and 4% preferred reading in digital environments. It is possible that reading information from printed sources is easier to understand than reading from digital sources (Ben-Yehudah & Eshet-Alkalai, 2018) and the convenience of underlining, note taking and marking (Kurata et al., 2016) on printed sources could have played a large role in this. On the other hand, there are studies in the literature which have shown that digital reading sources are preferred because of factors such as the conceptual and real connections between independent paragraphs in hypertexts and the ability to act freely in many aspects (Land & Bayne, 2011; Sidabutar et al., 2022).

Considering that they are still a young generation, pre-service teachers are expected to have a set of skills in using information and communication technologies or digital technologies (Claro et al., 2018) and due to the pedagogical training which they have been receiving, they are expected to perform appropriate instructional design using these skills (Engeness, 2021). However, it is important in this regard that they have knowledge and skills in the relevant field and exhibit a positive attitude before proceeding to the instructional design stage (Yurdakal & Susar Kırmızı, 2021).

In the world of the twenty-first century where it is difficult to keep up with the pace of digitalization, it is necessary to prepare the teachers of the future for this development. From this point of view, the evolution of education faculties in this direction has become a necessity of our age. It is recommended that the academics who train pre-service teachers should raise their awareness about using digital technologies which will continue to develop further in the future and ensure their proper integration into education and training and encourage their students to learn the appropriate use of developing digital technologies: the present study could usefully be re-examined in terms of the effects of different variables with a larger sample group.

Declarations

Conflict of Interest

No potential conflicts of interest were disclosed by the authors with respect to the research, authorship, or publication of this article.

Ethics Approval

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Contribution Rates of Authors to the Article

The authors provide equal contribution to this work.

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