

Scale Development Study for Prospective Teachers of Online Reading Strategies

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KEYWORDS Comprehension. Digital Literacy. Hyper Text. Teacher Instruction. Text Processing

ABSTRACT The study aims to develop the scale of classroom teacher candidates' online reading strategies. The participants included 371 teacher candidates enrolled in the department of classroom teaching at Nigde University in Turkey. The data collected were subject to exploratory and confirmatory factor analyses to determine the construct validity of the scale. The analyses conducted revealed that the scale with 16 items included four factors ("purposeful reading", "reading readiness", "selective reading" and "checking reading"). Cronbach's Alpha was determined as .832 for the entire scale, as .702 for the sub-dimension of purposeful reading, as .719 for reading readiness, .672 for selective reading, and as .654 for checking reading. The total variance of the scale was calculated as 53.87%. On the other hand, the results of the confirmatory factor analysis conducted to determine the structure of the scale revealed acceptable and good fit indices. The results indicate that the scale of online reading strategies is valid and reliable.

INTRODUCTION

The changes in information, technology and internet have also changed the ways to reach and use it. With the advent of the Internet and Information Communication Technologies (ICT), today's knowledge and information are frequently presented, distributed, received and decoded in hypertext format (Kang 2014: 1). Education and especially classrooms are the primary field affected by the changes in information and technology (Schmid et al. 2014) because, while the progress in information and technology improves with the contribution of education, educational environments are also the main places where these improvements take place most frequently. Therefore, education can be considered as the production and the consumption, the two majorly identified fields of improvements by the effective percolation of information, communication and technology.

New learning and reading environments require the integration of information and technology with education. Thanks to the internet and technology based resources, people have come across new reading environments and textual formations (Ertem 2013). While printed paper, book, journal, newspaper, etc. existed in the past, the digital versions of almost all contents are produced and offered to the readers through environments like computer and internet today. Besides, Ministry of National Education (MONE) in Turkey aims to improve the learning opportu-

nities by increasing the use of technology during education process. To this end, it offers many contents electronically to the students and teachers, which it gradually puts into practice (Ekici and Yilmaz 2013). Therefore, these contents are, or will be, increasingly read through screens and internet environments instead of printed paper. This shows that, as the contents in online and technological environments change, reading methods will also get changed accordingly.

The teachers, who have a significant role in education process, have to use online and technological resources effectively and efficiently and also teach these skills to their students. This is seen as (specific area abilities or field capabilities) of teachers and listed among the qualifications that today's teachers must have. Among MONE's criteria and performance indicators to determine teachers' field capabilities, there exist indicators such as making use of informatics, technology and internet resources. For example; The statement "Uses search engines, internet-site portals and databases in order to do research, reach information and share information", which is among the A2-level performance indicators of class teachers' field capability of individual and career development (being able to enable career development), refers to the class teachers' capabilities to read, get information and share it through internet resources (Milli Egitim Bakanligi-MEB 2008).

The capability of today's teachers to carry out the learning-teaching process integrated with

information, communication and technology resources can contribute to future students' learning in many fields, particularly in reading. In relation to that, Pearson et al. (2005) have revealed in their meta-analysis study that technological materials have positive effects on the readers' reading comprehension success. These results, in terms of reading, highlighting the importance of reading process in online environments, which are currently the most common information production and sharing environments.

Theoretical Framework

The notion of text reading has changed together with the popularization of information, communication and technology field (Park and Kim 2011; Ertem 2013). In fact, reading is commonly defined as the interaction between three basic variables; text, reader and activity (Reading Study Group RAND 2002). The notion 'text', one of the variables, has changed. While it was once considered mainly as printed materials, today it includes materials prepared and presented in electronic, digital and online environments as well. As a result, new text notions such as electronic text, digital text, online text, hypertext, etc. have been introduced. In this study, the emphasis is on online/internet text.

Online texts are considered as texts that are commonly presented with one or more elements like links, pictures, animations, sounds or images, that continuously broaden and that contain unlimited information (Coiro 2011a: 356). Online texts shouldn't be limited to digital texts. The beginning and ending points of digital texts are clear and can be linear. For instance, an e-book, e-journal or an article in the form of pdf may exist on the internet or in any database. This may be considered as the presentation of a printed material in electronic environment. However, online texts are a part of a dynamic and unlimited information system (Hill and Hannafin 1997). Its form and content continually change and develop. In wider perspective, online texts are nonlinear and enriched texts without much limitation. They consist of links and tabs and include elements such as sound, image, animation, etc. These texts enable readers to make new discoveries, relate different information, and get and process the information in a multi-perspective way (Coiro 2011a). Such texts have organization, content and richness rarely found in books (O'Connell 1999).

Although this increases the burden on the readers mentally, it also provides them an opportunity to achieve the content multi-dimensionally.

Readers' roles in the process of reading texts in digital environments and on the internet have differentiated from those in the process of reading printed materials, which has forced them to have different skills (Patterson 2000; RAND 2002; Coiro 2011b; Ortlieb et al. 2014). It's true that digital and online texts are seen more complicated by the readers (Coiro 2011b). Such texts may not have content organization similar to that in traditional texts. Elements such as table of contents and presentation of tables may be different from those in traditional texts and the function of these elements is embedded in the hyper-text system. In this view, the readers should carefully control the before and after of each link and reflect this to the reading process (Balcytiene 1999; Coiro and Dobler 2007). In addition, while they are reading hyper-texts, they should take the pictures and visuals related to the hyper-texts into consideration and be able to make comments on them making use of comprehension strategies (Coiro and Dobler 2007). This requires the readers to participate more actively in the process of reading hyper-texts than printed one (Burbules and Callister 2000), it shows the significance that they should acquire new skills in accordance with the nature of these texts.

Online text formation and online reading are seen different from traditional reading and text context. Poole (2011) emphasizes that, although there is still no agreement on the definition of it, online reading distinctly differs from reading printed texts. Coiro (2003) points out this difference through four points:

Printed Texts Are Linear: They have certain beginning and ending points. However, layout/design pages, hyper-links and audio files cause complexity in determining the beginning and ending of an online text. This may sometimes make it difficult for the readers to read and understand the texts.

Printed Texts Are Not Naturally Interactive: In other words, they are shaped by the writers rather than the readers. Online texts are those which the readers change and shape by themselves. Readers may become more active during the reading process and use the text in accordance with their own reading and comprehension process.

Printed Texts, If Any, Contain A Few Visuals: These visuals are limited to graphics, pic-

tures, charts and images. However, online texts usually contain videos, audio files, pictures and other multimedia elements. In such an environment, readers are able to get the content of the text in a multi-perspectives and enrich the reading process.

The Amount of Information in Both Types Considerably Differs: The content and amount of printed texts are limited due to printing cost. These texts are accessible mostly in libraries, teachers and bookstores. On the other hand, the amount of online texts is almost unlimited and they are accessible at many places. Readers have easier and cheaper access to these texts, which enables the enrichment of readers' reading resources.

Above mentioned differences indicate that reading process in online environments cannot be the same as that in printed materials. Therefore, the reading strategies that the readers use in online environments also change. This shows the necessity to focus on the reading process and strategies in order to make use of online environments effectively.

Studies Related to Online Reading Strategies

It is known that good readers make use of comprehension strategies in the process of reading printed texts (Paris et al. 1991). While reading printed texts, such readers benefit from the power of comprehension strategies and use them in the process of meaning formation (RAND 2002). It is pointed out that these strategies are necessary, but not enough, for readers to read in online environments (Coiro 2011b). Similarly, Leu et al. (2005) in their study have put forward that online environments require different reading skills from those needed in printed materials. According to these researchers, one who is rather good at reading printed materials may not be as successful at reading in online environments. This suggests that, although requirements that are related to the process of reading and comprehension are similar in both environments, reading in online environments and skills related to this are more complicated. Coiro and Dobler (2007) stated that internet texts are more complicated than traditional texts. In brief, it is understood that reading process in online environments is different and these differences, specifically in the use of reading strategies, are important. Many studies in which participants of dif-

ferent ages participate are conducted on the use of reading strategies in online environments. Coiro (2011b) points out that a reader's upper-cognition level helps him more deeply understand the texts he reads on the internet. He claims that the readers' upper-cognition strategies are among the most appropriate ones for storing in mind, critically evaluating and synthesizing the texts.

Schmar-Dobler (2003) has defined the online reading strategies as skipping, scanning, seeking and navigating. On the other hand, he has found out that their strategies of reading printed texts are finding important information, following and correcting the comprehension, activating the prior knowledge and inference. Corio and Dobler (2007) investigated 11 good readers', who are at 8th grade, strategies of reading on the internet. The study revealed that the students use the reading strategies of using prior knowledge resources, deductive reasoning and self-regulation. The study conducted by Coiro and Dobler (2007) also revealed similar results. The researchers conducted their study with 11 students from 6th grade. Based on the qualitative data analysis they obtained from the study, they stated that readers use three basic reading strategies; using prior knowledge resources, deductive reasoning and self-regulation. Kymes (2005) emphasized the importance of 6 different strategies in order to read in online environments. The researcher listed these strategies as "skipping and scanning, activating the prior knowledge, setting an objective-awareness, discovering the meanings of new vocabulary, taking notes, and evaluating the structure and quality of the text".

Studies in which the effects of strategies are experimentally compared do also exist. Hsieh and Dwyer (2009) emphasized repetitive reading strategy, key word strategy and question-answer strategy as online reading strategies, and they compared the effects of these strategies in online reading environments. The researchers concluded that repetitive reading strategy is more effective and it considerably improves the students' reading comprehension success.

Studies related to reading strategies in online environments exist among second language studies as well. Poole (2011) studied the online reading strategies of students learning English as a second language. The researcher revealed that the participants generally use the strategies 'interpretation' and 'dictionary using' while they

occasionally use strategies like ‘critical reading and evaluating’ and ‘using prior knowledge’. Huang et al. (2009) examined the online reading strategies of adults learning English as a second language. They determined the strategies as ‘general, supportive, problem solving and social-effect strategies’. Among these, students both in high success level group and low success level group have employed supportive strategies (using dictionary, translation, grammar, emphasis, and notebook) most. In terms of frequency after these strategies, the students used general strategies (key words, scanning, predicting, setting a framework) and problem solving strategies (summarizing, speed reading, pronunciation, semantic mapping) respectively.

While such studies in which individuals from different age groups participate show that readers use some strategies when reading in online environments, some other studies point out the effect of using these strategies on the success of readers. Online reading strategies are crucial for the 21st century teachers to make use of the advances in the fields of information, communication and to use them in both their personal developments and teaching process. According to Hodges et al. (2007), teachers generally need some educational strategies to teach any concept and information to their students more effectively. However, they may not have enough knowledge about these strategies or enough time to learn about them. Teachers’ and teacher candidates’ knowledge especially about reading and learning strategies in online environments should be determined and improved. Determining the teachers’ online reading strategies would be useful for the improvement works related to this field. From this view, the study aims to develop a teacher candidates’ online reading strategies scale. For that purpose, the dimension related to strategies are determined as preparation to reading, purposefully reading and selective reading, by scanning the literature related strategies and dimensions.

Preparation to Reading: Before reading in online media, readers should be make arrangements such as; determination of web sites related to reading process and searched keywords, search and availability of knowledge, control the consistency of title and cover, determination of knowledge passage, ensuring knowledge sources (Chen 2009; Akyol 2011). This process is mostly including pre-reading skimming and prepara-

tion process. These studies done during pre-reading were important due to being preliminary of other process of reading (Akyol 2011).

Purposeful Reading: Purposeful reading is the reason for reading from online media. According to Chen (2009) students understood their purpose for reading, they demonstrated more advanced strategies in looking for information or seeking knowledge on the Websites they visited. A good reader should determine the purpose of reading.

Reading Checking: Reading checking is all over controlling of readings by reader. In e-reading process, reader’s controlling process during online navigation is important. In internet media, how to navigate, how to access any knowledge and how to access any knowledge by considering purpose is the indicator of the control process (Talim Terbiye Kurulu Baskanligi -TTKB 2012). As part of screen reading during reading and comprehension increase efficiency during reading process (Gunes 2009). Skilled readers are thought to be aware of what and why they are reading. In case any problems occur, they set up plans or strategies so that they can ensure their comprehension of information in the text (Moktari and Reichard 2002).

Selective Reading: Nowadays knowledge amount increases, readers select the useful knowledge from these during reading. Reading is a selective process through which readers select language cues which match their expectations (Ajidah 2003). In other words, during selective reading process, readers themselves decide what is important to read or what is not (Duke and Pearson 2008). Readers selectively read to find out the cues that confirm or disprove their expectations about the subject (Ajidah 2003). Dagtas (2013) stated that most of the teachers always prefer reading by selection, scanning, and skimming from screen as they are distracted and bored easily during reading. Dagtas (2013) also pointed out “willingness to read the noticeable places first”, “eyestrain due to long passages” and “the emphasis on selecting and reading necessary parts” among the causes why most teachers prefer to read by selection, scanning and skimming strategies. Similarly, in the research conducted by Abdullah and Gibb (2008) who investigated the efficiency and usage of e-books, resulted that most attendants do selective reading including skimming from screen and research behaviors.

METHODOLOGY

Study Group

Three hundreds eighty-six students studying in the 1st, 2nd, 3rd and 4th grade classes of Primary School Teaching Department at Nigde University in Turkey participated in this study. However, after taking out the items with missing information or responses, the data obtained from 371 students has been analyzed. 295 (79.3%) of the participants are female and 76 (20.4%) of them are male. The participants are classified from the 1st grade to the 4th grade respectively as 80 (21.5%), 61 (64%), 120 (32.3%) and 110 (29.6%).

Data Collection and Analysis Process

Online Reading Strategies Scale (ORSS)

Related literature has been reviewed and theoretical framework has been established in order to determine the items to take place in the scale. As a result, an item pool of 32 items is set up. After that, 6 instructors doing related studies in reading field and 2 instructors working in Computer Education and Instructional Technology are determined as experts. In addition, 2 instructors studying in linguistics field are also asked to determine if the items in the scale are relevant in terms of reading and comprehension. Having received the expert opinions on the 32-item scale, changes have been incorporated in accordance with their opinions and a rough scale consisting of 29 items has been prepared. In order to find out the realization of the items in the scale, a 5-point grading from (5) 'Always' to (1) 'Never' is used. Accordingly, those whose average scale grades are under 2.5 are thought to use online reading strategies at low level while the others with grades higher than 2.5 are accepted as having high level of using online reading strategies.

Application and Analysis Process

In order to see whether there is a problem in the reading and comprehension of the items in the scale, a pre-test is conducted on 35 students studying at the 3rd grade of Primary School Teaching Department. Since no problems was observed, no changes were made in the scale. At the later stage, the 29-item scale has been applied to primary school teacher candidates to

measure its validity and reliability. After the data is transferred into the computer, the validity and reliability analyses are done accordingly.

RESULTS

Findings Related to the Content Validity of the Scale

An important step in developing a scale is content validity, which is defined by Turgut and Baykul (2011) as "to what extent an assessment instrument comprises the behaviors to be measured by that instrument". In this study, the opinions of 10 experts are asked in order to ensure the content validity. The results of the expert opinions are analyzed in accordance with Lawshe technique. In this technique, the number of experts for content validity should be at least 5 and the content validity index is considered 62% and over in an analysis with 10 experts (Yurdugul 2005: 2). The content validity index of the online reading strategies scale in this study is found over 62%, which means that the content validity of the scale is satisfactory.

Findings Related to the Construct Validity of the Scale

Construct validity is measured in order to determine to what extent the questions prepared for the scale measure the structure to be measured (Buyukozturk et al. 2010). In this study, two different factor analyses for construct validity are done. First, is the Exploratory Factor Analysis (EFA) to find out the factor structure of the scale and the other is the Confirmatory Factor Analysis (CFA) aiming to confirm the scale's factor structure (Buyukozturk et al. 2010)

The Results of Exploratory Factor Analysis (EFA)

KMO and Barlett's tests are done before the exploratory factor analysis of the scale. Because KMO value must be .60 or over and Barlett's test results must be significant for EFA (Buyukozturk 2007). KMO value is found .887 and the result of Barlett's test is Chi-square =31114.74; sd=435 (p=.0000) (see Table 1). These results show that the data is appropriate to factor analysis. After that, the exploratory factor analysis of the scale is done and the factors with factor

Table 1: The results of Exploratory Factor Analysis (EFA) and Reliability Analysis (α)

Item	Items	Factors and their loads			
		Factor 1 reading readiness	Factor 2 checking reading	Factor 3 purposeful reading	Factor 4 selective reading
1	Before reading the web-page, I pay attention to the coherence between the title and the content on the page.	.704			
2	I determine the most relevant one to my reading purpose among the results of search engines (Google, Yandex, etc.) before I start to read the web-page.	.684			
3	While reading the web-page, I read the important parts by selecting them with mouse.	.634			
4	Before reading the web-page, I decide if the resources I read are reliable or not.	.634			
5	I set my purpose of reading before I read the web-page.	.534			
6	While I read on the web-page, I make sure that I have added right key words to the search engines.		.742		
7	After reading the web-page, I check if I could find the information I'm looking for.		.694		
8	After reading the web-page, I check if I have learned something new.	.656			
9	While reading on the web-page, I check out the texts and related visuals, videos, etc.		.623		
10	Before reading the web-page, I take a look at the Hyperlinks.			.812	
11	Before reading the web-page, I determine key words related to the subjects I want to read and search.			.700	
12	Before reading the web-page, I reach the web-sites using the key words related to the subject.			.541	
13	While reading on the web-page, I pay attention to the main idea of the Hyper-text.			.507	
14	While reading on the web-page, I ignore the parts that I think are unrelated to the content.				.793
15	While reading on the web-page, I ignore directive pop-ups that are unrelated to the subject (eg. advertisement, etc.)				.761
16	While reading on the web-page, I take note of important points				.591
α		.702	.719	.672	.654
Variance		15.36	14.65	12.72	11.11

Alpha reliability co-efficient of the whole scale (α) = .832
 Variance of the whole scale = 53.87%

loads under .45 are excluded. Buyukozturk (2007: 124) states that factor load value for the selection of factors should be .45 or over. Accordingly, the scale is a 6-factor one. However, the scale is re-analyzed after the items which don't appear in any factors and those which appear in the same factor with a difference of lower than .10 between their two factors values are excluded from the scale (Buyukozturk 2007). As a result, the scale is seen to consist of 16 items and 4 factors. Factor loads of the first factor are between .534 and .704 while alpha (α) and variance are respectively .702 and 15.36. Factor loads of the second factor are between .623 and .742 while alpha (α) and variance are respectively .719 and

14.65. Factor loads of the third factor are between .507 and .812 while alpha (α) and variance are respectively .672 and 12.72. Factor loads of the first factor are between .591 and .793 while alpha (α) and variance are respectively .654 and 11.11. The total alpha and variance values related to the whole scale with 4 factors and 16 items are found respectively (α) .832 and (variance) 53.87%.

The Results of Confirmatory Factor Analysis (CFA)

Path diagram of the first-degree confirmatory factor analysis for the Online Reading Strate-

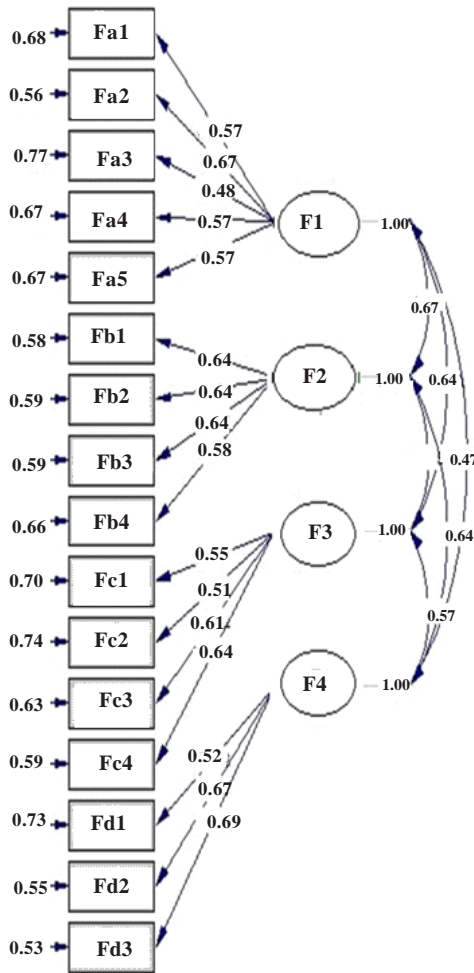
gies Scale is given in Figure 1. First, t-values of the model are examined and it is seen that all the paths are significant. Without having to do modifications on the results of the CFA related to the

ORSS latent variable, coherence index values are found as; $\chi^2=201.40$, $sd=98$, $\chi^2/sd=2.05<3$, $AGFI=.91, \geq .90$; $GFI=.94$, $NFI=.93$, $CFI=.96$ and $RMSEA=0.053$. That the RMSEA value is between .05 and .08 shows that the model has acceptable coherence and the other indexes are of great coherence (Joreskog and Sorbom 1996; Hu and Bentler 1999; Tabachnick and Fidell 2001; Brown 2006; Hooper et al. 2008; Kline 2011; Cokluk et al. 2012).

In Table 2, the results of the correlation analysis of between relations in the scale are given. According to the table, the factors are seen to have positive and significant relations with each other, which means that increase in every single factor will cause the other to increase as well.

DISCUSSION

Reading and learning through online environments is frequently emphasized in today’s education (Tyner 2008; Ertem 2013; Schmid et al. 2014; Wu 2014). Particularly reading draws more attention. In fact, reading skill is among basic skills in obtaining, interpreting and processing the information in online environments (Coiro 2003). In addition, reading sources have been diversified and online reading issue has started to attract attention in research studies on reading (Wu 2014). Actually, online reading environments affect readers’ reading successes (Ortlieb et al. 2014) and readers utilize various reading strategies during this process (Park and Kim 2011). In this view, the study aims to develop a teacher candidates’ online reading strategies scale in order to determine the teacher candidates’ online reading strategies. To this end, related literature is reviewed and expert opinions are obtained. Consequently, a 5-likert type scale with 29 items is applied to 371 primary school teacher candidates and the data is analyzed in terms of reliability and validity. Firstly, Exploratory Factor Analysis is done and 13 items are excluded from the scale either because they have low fac-



Chi-square-201.40, df=98, P-value=000000, rmsea=0.053

Fig. 1. First level CFA

Table 2: Between factors relations in the scale

		F1	F2	F3	F4
F1	Reading readiness	1*			
F2	Checking reading	0.60*	1*		
F3	Purposeful reading	0.64*	.65*	1*	
F4	Selective reading	0.47*	0.64*	0.57*	1*

*.05 significance level

tor loads or some exist in more than one factor. In the end, the scale with 16 items and 4 sub-dimensions is developed. The sub-dimensions “Reading Readiness”, “Checking Reading”, “Purposeful Reading”, and “Selective Reading” consist of 5, 4, 4 and 3 items respectively. The factor loads of the items in the scale are seen to vary between .507 and .812. In addition, the scale’s alpha and variance values are found as .832 and 53.87 respectively. Meanwhile, CFA is applied to the structures of the factors obtained by AFA. As a result, χ^2/sd and other coherence indexes AGFI, GFI, NFI, CFI and RMSEA) are seen to be acceptable and have great coherence (Joreskog and Sorbom 1996; Hu and Bentler 1999; Tabachnick and Fidell 2001; Brown 2006; Kline 2011; Cokluk et al. 2012; Hooper et al. 2008). Also the factors are revealed to have positive and significant relations with each other.

CONCLUSION

In this study is developed the scale with 16 items and 4 sub-dimensions. The sub-dimensions “Purposeful Reading”, “Reading Readiness”, “Selective Reading” and “Checking Reading”. The sub-dimensions are seen to have positive and significant relations with each other. The scale’s alpha value .832 and total variance value 54% is found. EFA and CFA results indicated that the scale developed in this study can be accepted as reliable and valid. As a result this scale can be used to determine teacher candidates’ online reading strategies.

RECOMMENDATIONS

In this study a scale has been developed that can be applied to teacher candidates and teachers of other branches as well. Teachers’ using online reading strategies and the determination of those strategies are important not only in teacher education but also for the teachers to make use of online environments in their job more effectively and to be able to do qualified reading. On the other hand, in order to determine concurrent validity of the scale, the relations between the scales that examine features related to online reading strategies and whose validity and reliability have been proven and the Online Reading Strategy Scale (ORSS) developed in this study can be examined. The relations between the teacher candidates’ use of Online Reading

Strategy and their reading attitudes, motivations and interests can also be examined.

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