A Systematic Literature Review
of Research on Digital Reading
: Focusing on Studies in the Field
of Korean Language Education

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I. Introduction

The development of ICT technology has caused a change in literacy practice throughout society and, accordingly, researchers in the literacy field have tried to define literacy practice using various terms such as 21st-century literacies, Internet literacies, digital literacies, new media literacies, multilitieracies, information literacies, ICT literacies, computer literacies, and so on (Coiro et al., 2008).

However, as technology and society change very rapidly, Leu and his colleagues proposed a term, new literacies as a theoretical framework to better understand and explain rapidly changing literacy practices in an environment that changes every day, called deictic (Leu et al., 2013).

One of the biggest features in the flow of change is the change to the digital environment. That is the reason that many researchers have focused on literacy practices in a digital environment and, as a result, the term digital literacy has become widely utilized (Bawden, 2008; Belshaw, 2011; Buckingham, 2015; Eshet-Alkalai, 2004; Gilster, 1997; Lankshear & Knobel, 2008).

Meanwhile, in the midst of these changes, researchers who were studying existing print-based reading comprehension began to study

the characteristics of reading comprehension in the digital environment by using the terms, digital reading or online reading, in the digital literacy framework. They have primarily tried to clarify how digital reading is different and similar to traditional printed-based reading (Kong et al., 2018; Delgado et al., 2018; Singer & Alexander, 2017a; Singer & Alexander, 2017b).

Recently there have been meaningful international attempts to clarify the concept of digital reading (Coiro, 2020; Salmerón et al., 2018; Singer & Alexander, 2017b). Keeping pace with this trend, it is important to check the kinds of research being conducted in relation to digital reading in the research field of Korean language education, as it can help to properly set the future direction of Korean language education.

Based on this context, the research questions in this paper are as follows:

1) What is the overall trend of digital reading research in the field of Korean language education in terms of year, school level, and research method, and 2) How has digital reading research been conducted, especially in terms of reading comprehension elements such as text, readers, activities, and context?

This study used the systematic literature review method to reduce the potential bias that can happen during the review process (Booth et al., 2016).

II. Background

Since the study of digital reading began, discussions have been divided about whether digital reading and printed reading are isomorphic.[1]

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1   Terms such as digital reading, online reading, and internet reading are used interchangeably; however, in this paper, it will be referred to as digital reading, for conve-

Research related to digital reading focuses on the difference between digital reading and printed reading, as well as on approaches that focus not only on the similarity between the two, but also on the increasing complexity required for digital reading (Cho, 2012; Lee et al., 2013).

Studies focused on the difference between digital and printed reading note that digital reading requires a new set of reading strategies that are different from conventional reading. These studies are significant in that they evoke the necessity of studying digital reading performance and reading strategies.

However, another approach contends that digital reading has a very large common denominator with print reading, but requires a more complex level of reading strategies required by media changes (Cho, 2014; Coiro & Dobler, 2007; Coiro, 2011). This perspective is meaningful in looking at digital reading from a more continuous point of view that the change to digital media is a remediation that accepts and expands existing media, rather than deny preceding media (Lee et al., 2013; Ok, 2013).

Recently, there have been attempts to break away from the point of view that compares digital reading and print reading in order to focus more on digital reading itself. The research of Coiro (2020) is meaningful in that it proposes a multifaceted heuristic of digital reading that allows us to look at digital reading based on the accomplishment of a community of reading research. Based on the heuristic, which attempts to manipulate reading comprehension into elements of readers, texts, activities, and sociocultural contexts by RAND reading study group (RRSG, 2002), she argues that it can help in a broader and deeper understanding of reading/reading in terms of evaluation, research, practice, and policy. Inspired by her research, therefore, this paper examines the ways in which digital reading research has been conducted in terms of text, readers, activities, and context in the field

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nience.

of Korean language education (Research Question 2).

First, text can be divided into literature/information/hybrid texts, multimedia/multimodal texts, onscreen texts, hypertext, hypermedia, Internet text, and augmented text, according to the degree of complexity in the semantic composition process. In this study, text was finally classified into onscreen text and Internet text. Because literature/information/hybrid texts and multimedia/multimodal texts are genre and format, they are classified according to different standards than is digital. Furthermore, onscreen text is digitized printed text, hypertext, and hypermedia are included in Internet text, while augmented text was not found in domestic studies.

Next, readers are characterized by four broad categories: cognitive capabilities, reading competencies, reading dispositions, and sociocultural identities. Cognitive capabilities refer to reading comprehension competencies, while reading competencies include knowledge and experience of various types of texts. Reading dispositions refer to qualities such as motivation and interest. In addition, readers form an identity from society or culture. This study explores the characteristics of readers that have been focused upon in order to understand reading comprehension in the field of Korean language education.

Activities entail the purpose, process, and results of the activity, and their types include information acquisition in a digital environment or single text reading for aesthetic purposes, multi-text reading for information acquisition or aesthetic purposes, critical media literacy activity, online research and inquiry. activity, and digital creation activity.

Finally, a sociocultural context exists. This includes medium (platform), community characteristics, and design considerations. Medium (platform) refers to printed texts, digital devices, softwares or apps, virtual worlds, and augmented realities. Community characteristics are school-based, after-school-based, home-based, and community-based. Design considerations include time limit, individual/pair/group, F2F/Remote/virtual world, and personal/task.

As mentioned above, this study looks at the overall trend (year, school level, research method) of digital reading research in the field of Korean language education. Plus, in particular, this study examines how digital reading research has been conducted by applying the heuristic consisting of text, readers, activity, and context in Coiro's (2020) work.

III. Methods

This study used systematic literature review (체계적 문헌 고찰) as a methodology to explore research trends in digital reading over several decades in the field of Korean language education. This method follows transparent, methodical, and reproducible procedures in selecting a collection of appropriate studies and extracting from them trends, patterns, relationships, and the overall picture (Borrego et al., 2014). The steps of a systematic literature review are defining the question, defining the scope, conducting the literature search, appraising the included studies, synthesizing the studies, and analyzing the review findings' robustness and validity (Booth et al., 2016).

Following a systematic literature analysis procedure, the researcher set up the following research questions: 1) What is the overall trend of digital reading research in the field of Korean language education in terms of year, school level, and research method, and 2) How has digital reading research been conducted, especially in terms of reading comprehension elements such as text, readers, activities, and context?

Then, the study utilized the database, RISS (Korea Education and Research Information Service, http://www.riss.kr) to search for Korean journal articles for terms related to "digital reading." The terms searched for at this stage were "Online Reading (온라인 읽기)," "Online Reading (온라인 독서)," "Digital Reading (디지털 읽기)," "Digital Reading (디지털 독서)," "Internet Reading (인터넷 읽기)," and "Internet Reading

(인터넷 독서).”²

   In addition, the scope of the search article was limited to those published in Korea Citation Index (KCI) and KCI candidates cases and which the above terms were included in the article name and keyword. In addition, the search scope did not include year of publication, and papers in all years searched by RISS were targeted. As a result of the first search, a total of 244 papers were published, with 42 cases of “Online Reading (온라인 읽기),” 13 cases of “Online Reading (온라인 독서),” 86 cases of “Digital Reading (디지털 읽기),” 40 cases of “Digital Reading (디지털 독서),” 46 cases of “Internet Reading (인터넷 읽기),” and 17 cases of “Internet Reading (인터넷 독서).” Among the 244 searched papers, papers were excluded through the following criteria:

   1) Duplicate papers
   2) Journals not related to “Korean language education”
      (e.g., psychology, English education, media, philosophy, etc.)³
   3) Papers whose research topic is not related to online reading
   4) Papers in which the original text cannot be accessed

   In the end, the above criteria excluded all but 41 papers. By carefully reviewing the selected papers, first, general trends such as the year in which the research was conducted, the target school level, and the research method were analyzed (Research Question 1). In addition, this study adopted Coiro's (2020) Heuristic (Research Question 2) to examine how digital reading research has been conducted in terms of text, reader, activity, and context.

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2   In South Korea, “읽기” (a native word) and “독서” (a Sino-Korean word) are used as synonyms for “reading.” Depending on the researcher's preference or academic background, “읽기” or “독서” can be used as a term corresponding to “reading.” Therefore, in this study, the researcher used both terms “읽기” and “독서” when searching for articles in RISS.

3   Among the papers recorded in journals related to general education or education in discipline, papers related to online reading were included.

Since Coiro's heuristic is very comprehensively composed of elements of text, reader, activity, and context, in this paper, some of the four elements of the heuristic were selected and used as the basis for analysis. First, "text" of digital reading studies was divided into Internet text and on-screen text. Second, this study investigated which part of each study focuses on the various characteristics of "readers": cognitive capabilities, reading competencies, reading dispositions, and sociocultural identities. Third, "activity" was divided into single text activity, multiple text activity, online inquiry activity, critical media literacy activity, and creative activity. Fourth, in the case of "context," this study focused on what medium and platform (devices and software) the studies focused upon.

IV. Results

1. Overall trends in current research on digital reading

1) Publication trends

When searching for papers, the scope of the year in which the paper was published was not limited. Studies on digital reading began in 2004 in the field of Korean language education, and a total of forty-one studies have been conducted. In 2008, six studies were conducted. This is because digital reading was the special topic of one journal, "Journal of Reading Research." Furthermore, it is notable that many related studies were conducted in 2013 and 2014. Since then, approximately two studies per year have been conducted, but the total number is still not large. Indeed, more digital reading related research needs to be conducted.
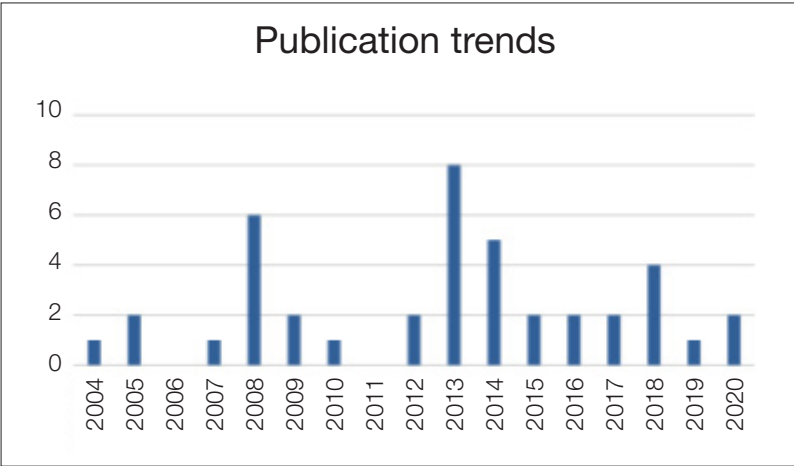
Figure 1. Publication trends

2) School level

Among the 41 studies, eleven studies (27%) were conducted on digital reading at the secondary school level; six studies (15%) at the elementary school level; and three studies at the college level and graduate school level. Twenty-one studies (51%) did not specify any school level.

It is noteworthy that most studies do not specify the school level. Among these 21 studies, 17 are non-empirical studies. Among the empirical studies, only four do not specify the school level. This indicates that specific individual studies on digital reading at each school level are needed.
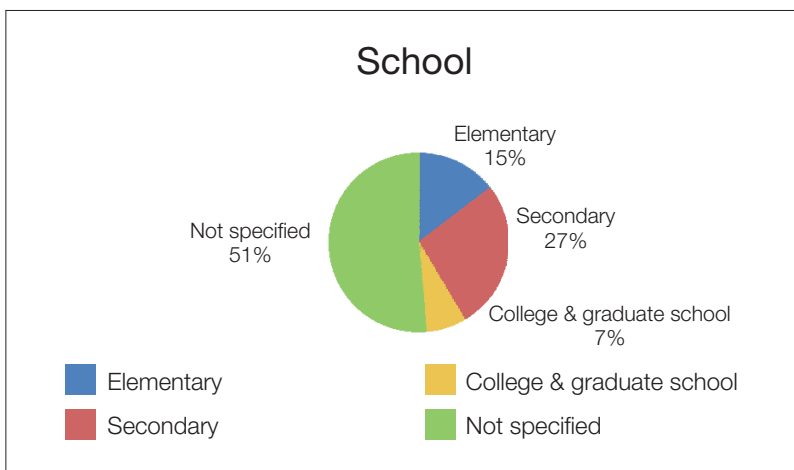
Figure 2. School level
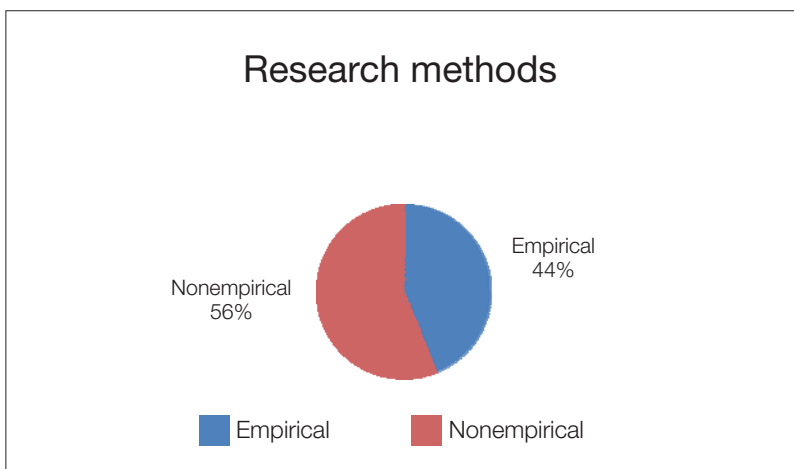
3) Research methods

Figure 3. Research methods

Of the 41 studies on digital reading, eighteen (44%) were empirical and twenty-three (56%) were nonempirical. Most non-empirical studies were essays on digital reading, though there were literature

studies on digital reading or research on educational program development. These non-empirical studies provide good implications for the direction of digital reading education. Nonetheless, more empirical studies based on actual data need to be conducted and accumulated.

Figure 4. Research methods (among empirical studies)

Among empirical studies, ten studies (56%) used qualitative methods and eight studies (44%) used quantitative methods. In empirical studies on digital reading, qualitative methods and quantitative methods were used in approximately the same proportion.

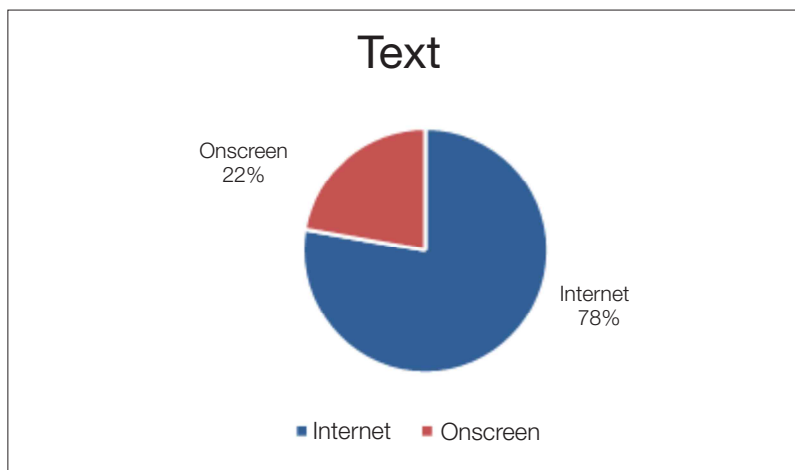## 2. Text, readers, activity, and context

1) Text

Figure 5. Text

In terms of the text of the digital reading study, fourteen (78%) focused on Internet text and four (22%) focused on onscreen text. Most of these were studies on reading Internet text in an open Internet environment. Internet text is an extension of hypertext (Coiro & Dobler, 2007) that mixes hypertext and hypermedia. Onscreen text is a printed form of text reading performed on a digital screen, and it has more characteristics of print reading.

Most studies have primarily focused on Internet text when referring to the unique characteristics of digital reading (Cho, 2014; Coiro & Dobler, 2007; Hinostroza et al., 2018; Walraven et al., 2008). Internet text is connected in multiple layers both vertically and horizontally through hyperlinks, and it involves hypermedia in multiple modes. Therefore, when reading Internet text, it becomes more important for readers to maintain coherence among ideas that readers encounter within and across texts (Salmerón et al., 2005). In addition, when

reading Internet text, an extension of hypertext, readers are required to have a more complex level of reading competences in locating and evaluating information than they must when reading on-screen text (Cho, 2014; Coiro & Dobler, 2007; Kiili et al., 2009). Therefore, the fact that more studies exist that regard Internet text as digital reading, rather than on-screen text as digital reading, is a positive result.
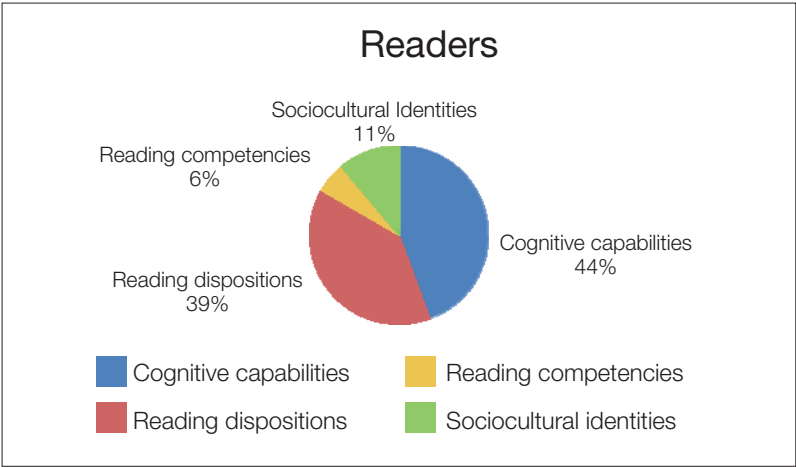
2) Readers

Figure 6. Readers

Coiro (2020) suggested that various characteristics of readers—such as cognitive capabilities, reading competencies, reading dispositions, and sociocultural identities—can influence reading comprehension in digital reading. This paper examined which portion of digital reading studies conducted in the field of Korean language education paid attention to the various characteristics of readers: cognitive capabilities, reading competencies, reading dispositions, and sociocultural identities.

Eight studies related to readers' cognitive capabilities represented the most (44%), followed by studies related to reading dispositions

(39%). On the other hand, two studies (11%) related to sociocultural identities and one (6%) related to reading competencies. The majority of domestic studies related to digital reading focused on the reader's cognitive aspect, especially reading strategies.

Many studies focused on cognitive processes as a factor influencing readers' reading of digital texts. According to Coiro (2020), at least five of these processes exist: attend to and remember information, monitor and self-regulate one's understanding of information, critically evaluate information for a number of purposes, integrate and synthesize information, and process information. at deep level.

It's notable that some studies conducted in South Korea focused on the process of critically evaluating information for a number of purposes among the above cognitive processes (Choi, 2013b; Han & Chung, 2015; Ki, 2014). For example, Han and Chung (2015) and Ki (2014) not only observed that elementary school students rarely perform critical evaluations of information, but also emphasized the need for education in this regard.

In addition, there were studies that focused on the process of monitoring and self-regulating one's understanding of information (Cho, 2012; Ki, 2014). According to Cho (2012), metacognitive reading ability is a key required to effectively use other reading skills.

Moreover, studies related to reading dispositions found that readers' attitudes toward reading had an important influence on reading comprehension, as commonly indicated by studies related to offline reading (Coiro, 2020). Studies in South Korea have investigated the perceptions of teachers and students related to Internet reading (Lee et al., 2013), as well as developed a survey of online reading attitudes and behaviors and skills (Ki, 2013). In addition, Kim and Choi (2020) have attempted to explain the ways in which readers' reading attitude influences reading comprehension.
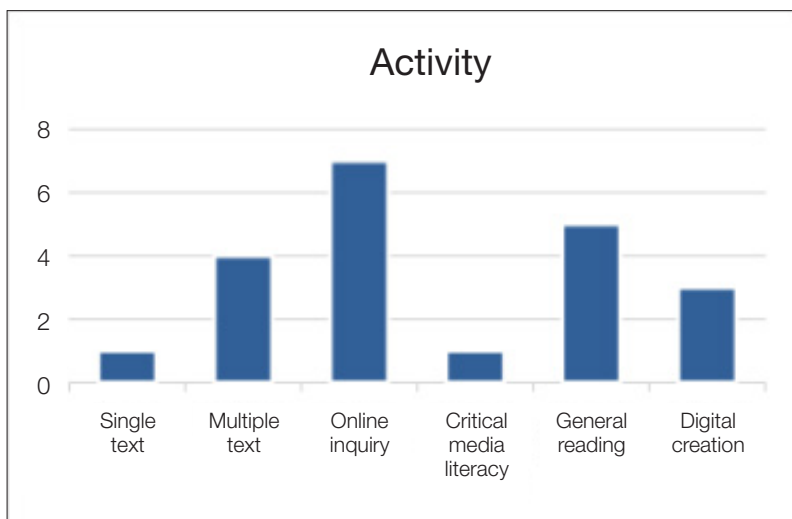
3) Activity

Activity

Figure 7. Activity

Though there was also a study on activity targeting with single text or multiple text, online inquiry to solve problems was most represented, with 7 items. Furthermore, many studies related to online inquiry focused mainly on the use of reading strategies among students performing online inquiry activities (Choi, 2013b; Han & Chung, 2015; Ki, 2014; Wang, 2013). The above studies primarily explored the ways in which online reading strategies explored in the United States are observed in various students in South Korea (Cho, 2014; Coiro & Dobler, 2007; Leu et al., 2013).

Following online inquiry activities, readers sometimes conduct digital creation activities in order to demonstrate their knowledge or competencies (Coiro, 2020). In addition, digital creation is an activity that emphasizes literacy practices that turn readers' knowledge into action through critical media literacy (Hobbs, 2017). These activities don't mean the mere consumption of digital content, but instead the creation of digital content and communication or sharing of digital

content. Among the studies included this review, this trend also found that students' online inquiry activities were linked to digital creation activities (Chung, 2009; Ki, 2014; Lee, 2018). Among these, Lee (2018) performed a multimodal writing activity utilizing visual images, which represent a meaningful digital creation activity that focuses more on the characteristics of digital media in a high school classroom setting. However, more research is needed to explore diverse digital creation activities using multiple modes such as sound or video.

Another study on general reading activities included multiple digital reading activities, instead of specific activities. Online inquiry is an educational activity that can improve digital reading performance and enable learning on the subject. Therefore, a lot of research on online inquiry activity is interpreted as a positive result, as it makes good use of the strengths of digital reading.
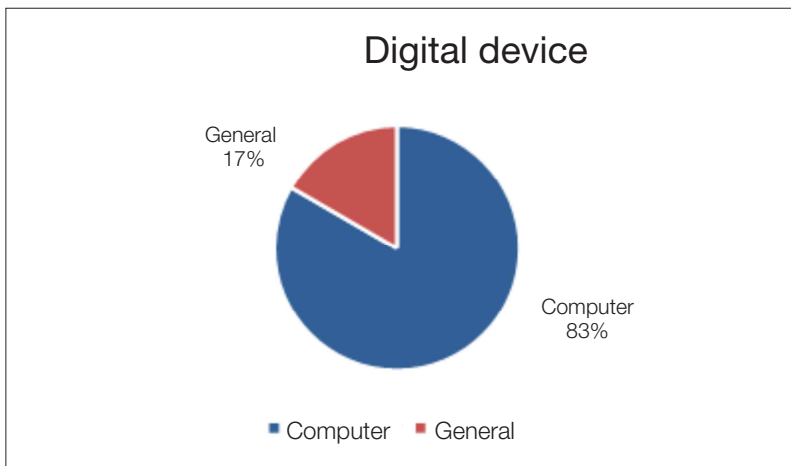
4) Context

Digital device

General
17%

Computer
83%

■ Computer ■ General
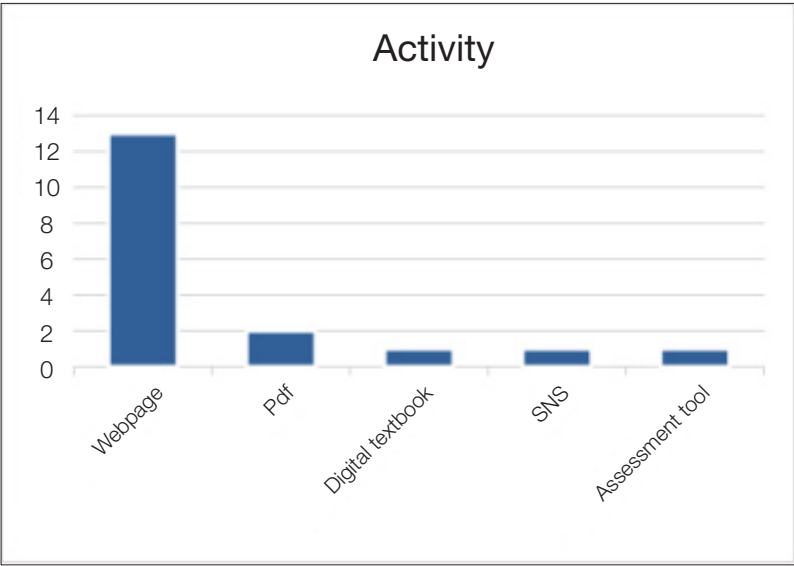
Figure 8. Digital device

Figure 9. Software

The context categories of digital reading heuristics proposed by Coiro (2020) include the medium or platform, response format, design considerations, and features of the community. This study focused on the medium/platform. First of all, in the case of digital devices, computers were used 83% of the time. In the case of software, webpages were the most common because there were many Internet-based activities. Therefore, most studies on digital reading in Korean language education focused on reading Internet web pages utilizing computers.

This trend of research may be due to the fact that computers and web pages currently represent the main medium/platform of digital reading in school. However, the fact that studies related to digital reading have concentrated medium/platform on one side may not reflect the unique characteristics of digital reading. Indeed, international studies tend to recognize that each type of medium/platform has its own characteristics that can aid or hinder reading comprehension (Coiro, 2020; Hobbs, 2017). Thus, researchers need to make efforts

to identify not only the affordances and constraints of other digital platforms, but also the relationship between them and reading performance (Coiro, 2020). For example, as the employment of various digital devices such as smartphones and tablets has recently increased, more research must be conducted on digital reading with these new devices and on reading with various softwares and apps.

V. Conclusion

In order to investigate the kinds of research conducted in relation to digital reading in the research field of Korean language education, this study reviewed 41 domestic studies using a systematic literature analysis method. First, overall trends such as publication year, school level, and research method were examined. In addition, based on Coiro's (2020) heuristics on digital reading, an exploration was made of the ways in which Korean digital reading studies were conducted in terms of text, readers, activities, and context. Based on this systematic literature review, this study proposes the following two discussions.

First, there are very few studies on the topic of digital reading in the field of Korean language education. Consequently, more studies on this topic need to be conducted. In particular, a lot of empirical research based on actual data is needed. If a large number of empirical studies are accumulated in various dimensions—such as assessment, research, practice, and policy—a more practical and better direction for the teaching and learning of digital reading can be suggested. Currently, there are many non-empirical studies that do not specify school level. Thus, it is necessary to conduct empirical studies based on data from various school levels.

Second, studies on the subject of digital reading need to clarify various related terms surrounding digital reading performance in terms of text, readers, activities, and context. For example, for some,

digital reading may be a narrow concept that means only on-screen reading, while, for others, it may be Internet text-based reading on a variety of platforms. For the former, digital reading may not be as different from print reading. However, for the latter, digital reading may require a deeper and more complex level of reading skills. Therefore, ensuring the conceptual clarity of terms related to digital reading will be a beginning to help you systematically compare studies and accumulate achievements in the field of reading research by clarifying the various aspects of digital reading performed in various environments (Coiro, 2020).

Finally, all empirical studies on digital reading reviewed individual digital reading performance, and further studies in various settings, such as pair and group performance, are required. The value of collaborative activities is increasingly emphasized in modern society. (Kirschner et al., 2009; Liu & Hmelo-Silver, 2010; Salomon & Perkins, 1998). As there are discussions that collaborative situations can help students read more complex texts, solve problems, and promote a deeper understanding of important content, they are performing digitally in collaborative situations—such as individual performance and in pairs and groups—more reading research is necessary.

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ABSTRACT

A Systematic Literature Review of Research on Digital Reading
: Focusing on Studies in the Field of Korean Language Education

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This study reviewed 41 domestic studies using a systematic literature analysis method to investigate the kind of research conducted in relation to digital reading in the research field of Korean language education. First, overall trends such as publication year, school level, and research method were examined. Studies on digital reading began in 2004 in the field of Korean language education, and a total of forty-one studies were selected. Among the 41studies, eleven studies (27%) were conducted on digital reading at the secondary school level.

In addition, based on Coiro's (2020) heuristics on digital reading, this study examines, how Korean digital reading studies were conducted in terms of text, readers, activities, and contexts. Regarding text, most (78%) focused on reading Internet text in an open Internet environment. Regarding readers, eight studies (44%) related to readers' cognitive capabilities , followed by studies related to reading dispositions (39%). Regarding activity, with 7 items, online inquiry to solve problems ranked the highest. In case of context, most studies on digital reading in Korean language education are on reading on Internet web pages using computers. Based on this systematic literature review, this study proposes the following two discussions.

KEYWORDS Digital reading, Online reading, Internet reading, Digital literacy, Systematic literature review