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교육학석사학위논문

Exploring English Online Research and  
Comprehension Strategies of  
Korean College Students

한국인 대학생의 영어 온라인 조사 및 이해  
책략에 대한 탐구

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Exploring English Online Research and  
Comprehension Strategies of  
Korean College Students

by  
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# Exploring English Online Research and Comprehension Strategies of Korean College Students

한국인 대학생의 영어 온라인 조사 및 이해  
책략에 대한 탐구

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# **Abstract**

Exploring English Online Research and Comprehension Strategies of  
Korean College Students

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Information and communication technology (ICT) is rapidly changing the nature of literacy, or the ability to read and write. To inform foreign language education practices that can empower students to properly retrieve and utilize information in today's society, research on the nature of reading that takes place on the Internet—referred to as online research and comprehension—is of paramount importance. As an initial step, this exploratory study investigated the strategies employed by six Korean tertiary-level learners of English that engaged in a second language (L2) online research and comprehension task. To this end, time-stamped screen recordings of the L2 online research and comprehension sessions, verbal data from stimulated recall interviews, and other contextual data were qualitatively triangulated in order to identify strategies utilized during L2 online research and comprehension and categorize them according to the model

of constructively responsive reading. The results revealed that a wide variety of strategies for constructing a coherent reading path as well as comprehending single and multiple digital texts contributed to successful L2 online research and comprehension. This provides further empirical support to the observation that online research and comprehension requires the use of both strategies for print-based reading and those unique to the Internet context. Furthermore, it sheds light on how L2 online research and comprehension might entail different cognitive demands from either print-based L2 reading or native language online research and comprehension. These findings demonstrate that the current conception of L2 reading needs to be expanded to encompass the novel challenges posed by the Internet. Consequently, this urges theoreticians and practitioners to begin discussing methods to incorporate this change into educational practices tied to L2 reading instruction and assessment.

Keywords: Online research and comprehension, reading strategies, second language reading, new literacies, reading instruction, reading assessment

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# Chapter 1. Introduction

The current study investigates the strategies utilized by Korean tertiary students while they read on the Internet in a second language (L2).<sup>1</sup> This chapter begins by discussing the factors that motivate this study. This is followed by the research question that this study aimed to address. Finally, the overall structure of the thesis is outlined, with brief descriptions of each of the following chapters.

## 1.1 Motivation for the Study

As technology is playing an essential role in our lives, it is “actually changing the way language is used and therefore the abilities required to use it” (Chapelle & Douglas, 2006, p. 16). Literacy—the ability to read and write—is no exception. As noted by Leu (2000), literacy has always been deictic throughout history, meaning that its conception and function have continuously changed according to the social context and the technologies it entails. For example, in medieval Europe, literacy was exclusive to the priesthood that read and interpreted religious texts to the laypeople and functioned to enforce religious dogma. However, due to the introduction of the printing press by Johannes Gutenberg, literacy became increasingly widespread to the public and began to be acknowledged as a means to seek individual salvation after the

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<sup>1</sup> The distinction between the terms *second language* and *foreign language* is not made throughout this thesis; instead, *second language* is used to refer to any language that is learned in addition to the native language of the speaker.

Protestant Reformation (Leu, 2000).

In today's society, the primary impetus driving the shift in the nature of literacy is the rapid emergence of the Internet (Cho, 2011; Coiro, Knobel, Lankshear, & Leu, 2008; Leu, Kinzer, Coiro, & Cammack, 2004; Leu, Kinzer, Coiro, Castek, & Henry, 2013). The Internet has become a vital source of information, as evidenced by various recent statistics. For instance, a nationwide survey conducted in 2017 show that about 45 million people, or approximately 90.3% of the South Korean population over three years of age, have used the Internet at least once in the past month. These users on average accessed the Internet for about 15 hours and 42 minutes per week, primarily for the purposes of communication, data/information gathering, and leisure (Ministry of Science and ICT [MSIT] & Korea Internet and Security Agency [KISA], 2018). Such increasing influence of the Internet has been noted in the field of education as well; as part of the 2014 World Innovation Summit for Education (WISE) survey *School in 2030*, which dealt with the future of education systems worldwide, 43% of 645 educational experts around the globe responded that online content will be the most important source of knowledge in the future (WISE, 2014). We have also begun to witness the gradual transition of teaching and learning to online environments with the advent of online distance learning platforms such as massive open online courses (MOOCs; Rha, 2015).

This phenomenon has profound implications for second language

education as well. Most importantly, it suggests that more attention should be paid to the L2 literacy required to read on the Internet. The fact that the English language remains as the lingua franca of the Internet, accounting for content in about 52.1% of all Internet websites (in stark contrast to the 0.9% of websites written in Korean; W3Techs, 2018, April 20), further emphasizes the need to train Korean students to actively retrieve information in English in order to fully utilize the potential the Internet holds for them. This urges L2 reading theoreticians and practitioners alike to question if the current focus on traditional print-based reading is truly enough to empower students with the skills and abilities necessary to become literate members of society in an age where retrieving information from the Internet according to individual needs is crucial—and if not, how we may go about innovating educational practices tied to L2 reading instruction and assessment.

These questions can in part be answered by unraveling the strategies readers utilize while they read for information on the Internet. Delving into reading strategies, or “deliberate, goal-directed attempts to control and modify the reader’s efforts to decode text, understand words, and construct meanings of text” (Afflerbach, Pearson, & Paris, 2008, p. 368) provides valuable insight from both theoretical and pedagogical perspectives. The first concerns the theoretical construct of reading comprehension. Readers’ strategy use, while due to its “deliberate” nature may not portray a complete picture of the implicit and

subconscious processes behind reading, sheds light on its multifaceted and latent nature (Grabe, 2009) by revealing the cognitive processes that it entails.

Examining strategy use also has ample pedagogical implications; the strategies that are essential to successful reading can become instructional objectives that are explicitly demonstrated by teachers and practiced by students in the classroom (Afflerbach et al., 2008). A standing line of empirical research in comprehension instruction attests to the overall effectiveness of such explicit strategy instruction in fostering learners' reading ability (Brown, 2017; Grabe, 2009; Taylor, Stevens, & Asher, 2006).

Since the early 2000s, literacy researchers have begun to conceptualize the reading that takes place on the Internet and examine its unique characteristics. This kind of reading has been referred to in the literature as *online reading comprehension* (Coiro, 2003, 2007, 2011; Coiro & Dobler, 2007; Leu et al., 2005, 2007), *Internet reading* (Cho, 2011, 2014; Cho & Afflerbach, 2015; Schmar-Dobler, 2003; Zhang & Duke, 2008), or more recently, *online research and comprehension* (Leu et al., 2013; Leu, Forzani, et al., 2015; Leu, Kiili, & Forzani, 2016; Leu, Zawilinski, Forzani, & Timbrell, 2015). Studies within this line of research typically directed skilled readers to read on the Internet in their native language in an attempt to identify characteristics of skilled online research and comprehension (ORC hereafter) and its relationship to print-based reading.

However, to date, ORC in a second language (L2 ORC hereafter) has not been amply researched. This is in part due to the confusion with the term *online reading* by researchers in ESL (English as a second language) contexts. That is, studies that have purported to investigate “L2 online reading” administered tasks that directed participants to only read a static, designated set of text on the computer (e.g., Huang, Chern, & Lin, 2009; J. Park, Yang, & Hsieh, 2014; Taki, 2016), thereby failing to incorporate the active process of constructing a reading path that characterizes ORC. Studies on “L2 online reading” also tended to rely excessively on the use of self-report questionnaires, which has limitations that need to be complemented by other methods of data collection.

In light of the contextual factors discussed thus far—the change of literacy driven by the Internet, the theoretical and pedagogical values of researching reading strategies, and the methodological issues with existing studies on L2 ORC—the aim of the current study is to complement this line of research by exploring strategy use behind L2 ORC, implementing research methodology that closely replicates authentic L2 ORC.

## **1.2 Research Question**

More specifically, the current study was inspired by the following research question:

*What strategy use is observed from Korean tertiary-level EFL learners conducting L2 ORC in English?*

In this study, strategy use by tertiary-level learners of English engaged in

an L2 ORC task is analyzed. This research question will provide the opportunity to depict in depth the participants' L2 ORC as well as any individual differences that are observed.

### **1.3 Organization of the Thesis**

The present thesis is comprised of six chapters. The current chapter—Chapter 1—discussed the contextual factors that motivate this study and presented the research question it aimed to address. Chapter 2 introduces the theoretical frameworks that shaped this study, namely the new literacies of online research and comprehension, and constructively responsive reading. This is followed by a review of the extant literature on ORC, including empirical studies conducted with both participants who speak English as a native language and as a second language. Chapter 3 describes the research methodology implemented in this study, outlining the phases of participant selection, data collection, and data analysis. Chapter 4 presents the results of the current study, which are subsequently discussed in Chapter 5. Chapter 6 concludes the thesis by summarizing the main findings and discussing their implications for theory and practice.

## **Chapter 2. Literature Review**

This chapter introduces the theoretical frameworks that guided the present study and reviews the literature relevant to strategy use behind ORC. First, the framework of the new literacies of online research and comprehension, which has conceptualized reading on the Internet from a literacy perspective, is introduced. Subsequently, the model of constructively responsive reading is presented; according to this model, the proficient reader consciously *responds* to the text while they actively *construct* meaning from it. The chapter concludes with a review of the literature stemming from these two theoretical perspectives as well as others closely related to ORC.

### **2.1 Theoretical Frameworks**

#### **2.1.1 The New Literacies of Online Research and Comprehension**

As mentioned in the previous chapter, literacy is a deictic construct that continuously changes due to sociocultural factors in effect (Leu, 2000). The theoretical framework that acknowledges this and aims to capture such ephemeral nature of literacy is known as new literacies (Coiro et al., 2008; Leu et al., 2004, 2013). According to this framework, there are many new literacies that are currently emerging due to the advancement in information and communication technology (ICT), such as reading linked to text messages, e-mails, blogs, social media, video games, etc. Just as many are theoretical perspectives that can guide the inquiry into these new literacies, most notably

literacy research, sociolinguistics, and cognitive theory. Leu et al. (2013) propose a dual-level theory of lowercase *new literacies* and uppercase *New Literacies* in order to account for such growing multiplicity; they suggest that specific research into individual areas of new literacies be referred to as lowercase theories of new literacies and the common characteristics that emerge from these lowercase new literacies be known as the broader uppercase theory of New Literacies. By integrating various new literacies into a unified framework, it is expected that researchers from each specialized discipline would be able to keep track of the macroscopic shift in literacy that is taking place. Although pinpointing the exact characteristics underlying New Literacies is nearly impossible due to their flexible nature, some central principles of New Literacies such as the following have been identified through previous research.

1. The Internet is this generation's defining technology for literacy and learning within our global community.
2. The Internet and related technologies require additional new literacies to fully access their potential.
3. New literacies are deictic.
4. New literacies are multiple, multimodal, and multifaceted.
5. Critical literacies are central to new literacies.
6. New forms of strategic knowledge are required with new literacies.
7. New social practices are a central element of New Literacies.
8. Teachers become more important, though their role changes, within new literacy classrooms (Leu et al., 2013, p. 1158).

The sixth principle that postulates that new literacies entail the use of novel strategies is especially pertinent to the current study. While the Internet holds unlimited potential for L2 readers worldwide, its unique characteristics and

new technologies also pose a myriad of challenges for them. This further necessitates more research like the current study, which aims to examine how L2 readers utilize strategies in order to cope with such challenges posed by the new reading context.

Among such new literacies, one noteworthy lowercase theory that has received attention in the literature is the *new literacies of online research and comprehension*,<sup>2</sup> or the new literacies required in order to search for information on the Internet. According to this perspective, five essential practices comprise ORC: first (a) identifying a problem, and then (b) locating, (c) evaluating, (d) synthesizing, and (e) communicating information (Leu et al., 2004, 2005, 2007, 2013, 2016; Leu, Forzani, et al., 2015; Leu, Zawilinski, et al., 2015). A more detailed definition of ORC that has been developed under this framework by Leu and colleagues (2013) is cited below:

The new literacies of online research and comprehension include the skills, strategies, dispositions, and social practices necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge and influence all areas of our personal and professional lives. Online research and comprehension is a self-directed process of constructing texts and knowledge while engaged in several online reading practices: identifying important problems, locating information, critically evaluating information, synthesizing information, and communicating information. Online research and comprehension can take place individually, but often

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<sup>2</sup> It should be noted here that when this new literacies framework began to emerge in the early 2000s, what is known as online research and comprehension now was initially referred to as *online reading comprehension*. However, in order to clear the misconception that this practice simply involves reading text on a monitor, the term *online research and comprehension* has been coined to emphasize the active search process it entails (Leu et al., 2016).

appears to be enhanced when it takes place collaboratively (p. 1164).

The theoretical framework of the new literacies of ORC contributes to the current study from two important aspects. First, the classification of the five components of ORC provides a theoretical lens through which the unique nature of L2 ORC could be identified and analyzed in light of print-based L2 reading. That is, by scrutinizing the cognitive processes linked to each phase of L2 ORC, it would be possible to identify where the inherent gap between L2 ORC and traditional, classroom-learned L2 reading lies. In addition, in-depth examination of the practices tied to L2 ORC would also reveal how the “second language” factor comes into play and shed light on the extent to which L2 ORC might differ from the typical ORC Korean students perform in Korean.

Moreover, the tenets of the broader uppercase theory of New Literacies provide further justification for the current study. Given that today’s literacy is not the same as that of yesterday and again will be different from that of tomorrow, efforts towards continued research into the shifting nature of literacy is required; the current study aims to serve this purpose for L2 literacy by investigating strategy use behind L2 ORC.

### **2.1.2 Constructively Responsive Reading**

In the field of reading comprehension, ample research has been conducted on the strategies utilized by readers, as they provide a means to delve into the latent cognitive processes behind reading comprehension. However,

there has been no universal consensus on the exact definition of reading strategies (Afflerbach et al., 2008; Brown, 2017), making it difficult to obtain comparability between findings from different studies. This is further muddled by the fact that the categorization of strategies varies widely across studies (Joh, 2014), without a common language for reading strategies.

Pressley and Afflerbach's (1995) meta-analysis is especially seminal in this regard. They synthesized a total of 38 studies on reading strategies from various disciplines (e.g., cognitive psychology, reading, and poetics) that implemented the methodology of verbal protocol, during which a research participant speaks out loud whatever they are thinking at the moment (Hilden & Pressley, 2011). From this synthesis emerged the model of *constructively responsive reading*, the gist of which is that expert reading is characterized by the reader's conscious, intentional, and goal-directed *response* to the text while they actively *construct* meaning from it. As Pressley and Afflerbach (1995) note of the skilled reader:

That is, the general meaning construction tendencies of the skilled reader are shaped into specific responses to a particular text largely by specific characteristics of the text and information in it. The reader's constructive tendencies and responses to text determine the type of meaning construction and, ultimately, the meaning that is finally arrived at, [...] (p. 105)

They also identified three broad types of constructively responsive reading strategies, which are: *Identifying and Learning Text Content*, *Monitoring*, and *Evaluating*. First and most prominently, readers continuously

make effort to identify and construct meaning from the text before, while, and after reading it. What is noteworthy is how the strategies linked to these different phases of reading interact. For example, the expectations readers hold about the text before reading can influence the level of attention they dedicate to its actual reading. Moreover, dissatisfaction with the meaning of the text constructed during the first encounter with the text can lead to the readers' additional processing of it (e.g., re-reading). Secondly, monitoring strategies are tied to the readers' perception of their ongoing reading comprehension and are thus metacognitive in nature. That is, if the readers see that their comprehension is proceeding smoothly, they will continue processing the text in the same manner. In contrast, if they identify a comprehension problem, they will change their processing strategies in an attempt to correct it. Finally, readers constantly evaluate the text that has been processed from various perspectives, including its style, validity, quality, relevance, and credibility. As Pressley and Afflerbach (1995) note, successful reading is characterized by the interplay of these three types of strategies; expert readers felicitously utilize these strategies in response to the text while they construct meaning from it.

Although this meta-analysis laid the foundation for reading strategy research afterwards, it had limitations in that the vast majority of the studies that were included in the analysis focused on the comprehension of single print text. In other words, it could not take into consideration models of multiple text

comprehension, which was just beginning to emerge in the literature. In order to mitigate such shortcoming, Afflerbach and Cho (2009) extended the model of constructively responsive reading by incorporating additional studies on both multiple text reading as well as Internet/hypertext reading. The profiles of the research studies included in the two meta-analyses are presented in Table 2.1.

Table 2.1

*Profiles of the Research Studies Reviewed in Pressley and Afflerbach (1995) and Afflerbach and Cho (2009)*

Characteristics	Pressley and Afflerbach (1995)	Afflerbach and Cho (2009)
Number of studies	37 studies (single text reading); 1 studies [ <i>sic</i> ] (multiple text reading)	14 studies (multiple text reading); 32 studies (Internet/hypertext reading)
Nature of studies	Verbal protocol analysis	Triangulation of 2 or more data sources is much more common: Verbal protocol analysis, screen protocol, interview and observation, log files, survey and questionnaire
Outlets for work	Journal articles and book chapters in cognitive psychology, reading, writing, linguistics, poetics	Journal articles and book chapters in information and library science, educational technology, multimedia and hypermedia media, cognitive psychology, domain-specific learning, reading and literacy, and writing

*Note.* Reprinted from Cho (2011), p. 83.

More specifically, Afflerbach and Cho's (2009) grounded analysis of studies on multiple text reading and Internet/hypertext reading revealed new kinds of constructively responsive reading strategies that were not accounted for in Pressley and Afflerbach (1995). As for the comprehension of multiple texts, Afflerbach and Cho (2009) note how relevant research findings consistently

emphasize the importance of “piecing together” information contained in each different text by comparing, contrasting, relating, and differentiating them. The authors identified such “linking” strategies that readers utilize when reading a set of texts (e.g., *reading and relating the current text to recently read texts*, *managing the local and global processing in one or multiple texts*, and *judging usefulness of information provided by a single text in relation to other text*) and classified them according to the three preexisting broad categories of strategies (i.e., *Identifying and Learning Text Content*, *Monitoring*, and *Evaluating*).

Regarding Internet/hypertext reading, the authors observe that it is partially analogous to multiple text reading in that it requires strategies to relate information scattered across a complex reading context. However, they also point out that the flexibility of hypertext structures allows readers to make choices on their path of meaning construction but also demands that readers maintain their focus in the midst of irrelevant or unnecessary information. This consequently mandates the use of strategies for *Realizing and Constructing Potential Texts to Read*, or “the activity to locate, identify, and select useful texts and links, and eventually to determine the order of reading and construct unique and individualized reading paths in Internet hypertext contexts” (Cho, 2011, p. 87). These strategies, such as *scrutinizing Internet hypertextual links to anticipate and judge the usefulness and significance of the information*, help readers reduce the level of uncertainty in such vast and unbounded reading

contexts.

As a result of Afflerbach and Cho's (2009) examination of multiple text reading and Internet/hypertext reading, two noteworthy revisions were made to the original model of constructively responsive reading. First, the three preexisting categories of strategies (i.e., *Identifying and Learning Text Content*, *Monitoring*, and *Evaluating*) were enriched by the incorporation of intertextual reading strategies that are essential for assembling information from two or more different texts. In addition, a new category of strategies labeled *Realizing and Constructing Potential Texts to Read* emerged from the analysis. This resulted in a theoretical model of reading strategies that is comprehensive enough to account for reading that takes place in both traditional contexts (e.g., reading a single print text) and newly created contexts (e.g., reading on the Internet).

More recently, Cho and Afflerbach (2017) applied the model specifically to the reading that takes place on the Internet. They note how the Internet is a vast hypertext system that has no central organizing principles like those of printed books. According to them, reading in such multilayered digital text environments involves constructing a coherent information representation, coherent intertextual relationships, and coherent reading paths. In accordance to such conceptualization of ORC, they conclude that "reading strategies for single texts, multiple texts, and multilayered hypertexts that subsume multiple links, pages, and sources have considerable application to online reading that occurs in

a complex textual environment” (p. 127). Consequently, although the authors included a few more strategies that were identified through most recent studies, they did not make any radical changes to the constructively responsive reading strategies outlined in Afflerbach and Cho (2009). Instead, they first sorted out representative strategies from Pressley and Afflerbach (1995) as *strategies for comprehending a single digital source*. In addition, they relabeled the strategies for multiple text comprehension and Internet/hypertext comprehension presented in Afflerbach and Cho (2009) as *strategies for comprehending multiple digital texts* and *strategies for the construction of reading paths* respectively. The labels of the sub-categories of strategies have also been revised to reflect the nature of ORC in a more pertinent manner (refer to Appendix A for full catalogue).

Although the model of constructively responsive reading is highly relevant to the intersection of ORC and reading strategies—the focus of this study—there is one caveat to adopting this framework for the current study. This concerns its generalizability to L2 ORC, as the model is based solely on the research findings of strategies utilized by readers reading in their first language (L1). Nonetheless, it is expected that most of the strategies behind L2 ORC will be accounted for by this framework, given that the reading comprehension strategies that underlie both successful L1 reading and successful L2 reading seem to largely overlap (Grabe, 2009). It remains to be seen, however, whether L2-specific strategy use will be observed from readers that are engaged in L2

ORC.

## **2.2 Research on ORC**

### **2.2.1 ORC by Native Speakers of English**

Initial work that addressed ORC from the perspective of literacy was conceptual in nature, discussing the potential changes to reading posed by the Internet. For example, Coiro (2003) conceptualized ORC by building upon RAND Reading Study Group's (2002) definition of print-based reading comprehension and discussed how the Internet has influenced each of its key elements. She noted how Internet text is a nonlinear hypertext that integrates multiple-media formats and therefore requires skillful, individualized navigation from readers. In terms of the activity of reading, she pointed out the need for readers to adopt a critical stance towards the text and also search, locate, and synthesize diverse perspectives. Schmar-Dobler (2003) roughly compared the reading strategies for print-based reading and Internet reading drawing on Pearson, Roehler, Dole, and Duffy's (1992) list of seven comprehension strategies that differentiate expert readers from novice readers. Based on observations of and interviews with adolescents, she noted that while most strategies apply to both contexts, Internet reading requires the use of skimming and scanning as well as guiding questions that keep the reader focused without being sidetracked.

Exploratory studies that followed shortly afterwards relied on qualitative

research methodology such as grounded-theory analysis in order to identify the distinct characteristics of ORC. Coiro and Dobler's (2007) groundbreaking study analyzed the think-aloud protocols of 11 sixth-grade students judged as skilled readers based on standardized reading scores, reading report card grades, and Internet reading experience. The skilled readers were administered two online reading tasks; the first task asked them to read on a designated website for answers to seven literal or inferential comprehension questions, whereas the second task directed them to answer two open-ended questions based on the sixth-grade science curriculum by conducting a search on the Internet. The results revealed that while some processes behind ORC overlapped with those linked to print-based reading, the readers demonstrated more complex ways of utilizing prior knowledge sources (e.g., prior knowledge of website structures and search engines), inferential reading strategies (e.g., more forward inference-making), and self-regulated reading processes (e.g., rapid choice-making cycles) during ORC. Their subsequent 2004 replication study with less-skilled readers (as cited in Coiro, 2007) confirmed the emergence of similar themes—these readers demonstrated less-skilled ORC largely due to their lack of ability to apply those three types of processing skills in an appropriate manner.

Based on these exploratory studies on ORC, assessment tasks aimed at measuring the ability to read proficiently on the Internet have been developed and validated. The most relevant work in this regard is the Online Reading

Comprehension Assessment (ORCA) Project by the New Literacies Research Lab at the University of Connecticut (Maykel, Forzani, & Leu, n.d.). The New Literacies Research Lab developed two types of assessment tasks (i.e., ORCA-Multiple Choice and ORCA-Simulation) that are designed to assess performance in the four skill areas of locating, evaluating, synthesizing, and communicating (LESC) in an Internet environment.

The prototype versions of ORCA were applied to ORC research, making it possible to measure and operationalize the ability to read on the Internet. This resulted in more empirical studies that complemented earlier work on ORC. For instance, Coiro (2007) administered a prototype version of the ORCA to middle school students in northeastern United States, with a focus on how various skill and strategy use differentiates ORC of different proficiency levels. Contrastive case analysis of the ORC of three focal students (i.e., one each from low, intermediate, and high proficiency groups) revealed a developmental progression in the readers' skills and strategies. She noted that the gap observed in the students' performance during each phase of ORC (i.e., locating, evaluating, synthesizing, and communicating) seemed to stem from differences in five key dimensions of reading comprehension: (a) fluency, (b) self-regulated reading, (c) inferential reasoning, (d) critical reasoning, and (e) metacognitive knowledge about what, how, and when to employ particular ORC processes.

Quantitative studies utilizing versions of ORCA provided further

empirical evidence that ORC requires related yet distinct abilities from those necessary for print-based reading. For example, Leu et al. (2005) administered a version of ORCA with online reading tasks on a blog interface (i.e., ORCA-Blog) to 89 seventh-grade students and observed that there was no significant correlation between ORCA scores and statewide reading achievement measures. This is in contrast to the findings of a later study by Coiro (2011), who administered two versions of ORCA that contained a series of information requests on an online quiz platform (i.e., ORCA-Scenario I, II) to 109 seventh-grade students. A subsequent multiple regression analysis revealed that the students' standardized reading scores explained about 35% of the variance in ORCA-Scenario II scores. Coiro (2011) notes that such conflicting finding is potentially due to the difference in the complexity of the tasks in the two types of ORCA. That is, online reading situated in a more complex reading context (e.g., the blog interface implemented in Leu and colleagues' 2005 study) may have required specialized reading strategies that are less similar to print-based reading strategies. Either way, it seems to be the case that ORC is not isomorphic to print-based reading.

Other studies focused on identifying and categorizing specific strategies by implementing more authentic ORC tasks. Zhang and Duke (2008), for example, examined the reading strategies of 12 proficient adult readers that took part in three Internet reading tasks with different purposes: locating factual

information designated by the researchers, acquiring general knowledge on a topic of choice, and being entertained. Based on a grounded-theory analysis of the participants' stimulated recall protocols and video recordings of the reading sessions, they observed that some strategies were used consistently across different tasks while others were more purpose-specific. Additionally, they noted that Internet reading for different purposes was characterized by divergent patterns of strategy use, further emphasizing the impact of the purpose of reading. Although this study was one of the first to systematically investigate the potential influence of the task on ORC, the generalizability of its findings remains limited as the categorization of strategies was overly fine-grained. For instance, they identified strategies such as *uses "I'm feeling lucky," uses keywords with "kids" to find something easy to read, and ignores advertisement on purpose*, which are difficult to interpret in light of other models of reading strategies, especially those based on print-based reading.

Cho (2014) mitigated this shortcoming by grounding his study in the model of constructively responsive reading outlined in Afflerbach and Cho (2009; see section 2.1.2). Based on this framework, he analyzed the strategies observed from seven high school students that were expert readers. The students were directed to read on the Internet to formulate a critical question about a controversial topic. During the first session, the students searched for three websites they would solely read from in order to obtain information. Then,

during the second session, they read on the three websites they had selected and generated their questions. The mixed-method analysis of the think-aloud protocols and screen recordings indicated the centrality of strategies categorized under *Realizing and Constructing Potential Texts to Read*, which were pointed out as characteristic of hypertext and Internet reading by Afflerbach and Cho (2009). Another significant finding of this study was that the effective use of these strategies required the appropriate use of the other three types of strategies (i.e., *Identifying and Learning Text Content*, *Monitoring*, and *Evaluating* strategies), providing further evidence for the interactive and complementary nature of reading strategies noted by Pressley and Afflerbach (1995).

As can be seen, the vast majority of studies on ORC in one's native language have been conducted with adolescents (Cho, 2014; Coiro, 2007, 2011; Coiro & Dobler, 2007; Leu et al., 2005; Schmar-Dobler, 2003), focusing primarily on the strategies utilized by proficient readers. Triangulation of the readers' verbal protocols, screen recordings of ORC sessions, and other contextual data (e.g., reading proficiency measures) repeatedly indicates that successful ORC requires the use of additional strategies in comparison to traditional print-based reading and therefore is not isomorphic to it.

### **2.2.2 L2 ORC by Learners of English**

Research on L2 ORC conducted in ESL contexts is relatively scarce and tends to apply existing theoretical models of reading strategies identified through

print-based L1 reading comprehension research. Konishi's (2003) study was one of the first to empirically delve into reading on the Internet in another language; six Japanese college-level ESL learners in Australia were assigned to conduct either of two tasks that had different reading purposes (i.e., browsing and reading an article of choice or locating factual information). She analyzed the participants' think-aloud protocols and video recordings of the computer screen according to Carrell's (1998) distinction between cognitive and metacognitive reading strategies. During her analysis, she noted that there was a need to account for strategies linked to navigating through various web pages, which she termed *navigational strategies*. Another significant finding was that some participants tended to stray from the task directions when they encountered web pages to their interest.

A later study by H.-R. Park and Kim (2011) adopted a similar research methodology with three college-level ESL learners engaged in three different tasks (i.e., locating information, comparing websites, and navigating a given website). The researchers analyzed their think-aloud protocols without being guided a priori by a theoretical framework. Seven themes of strategy use emerged from their analysis, of which they note *using hypermedia* (e.g., constructing meaning from multimedia) and *using computer applications and accessories* (e.g., spelling and grammar checkers) were unique to ORC. Although these studies shed more light on how ORC differs from print-based

reading, they were not able to discuss the specific “L2” nature of L2 ORC.

This gap was addressed in part by J. Park et al. (2014), who observed how the seven graduate-level ESL learners that participated in their study actively referred to online dictionaries and websites in their L1 to complete the task, which was to answer reading comprehension and vocabulary questions while reading a blog post on cloud computing and an online news article on global warming. The researchers also revealed that the participants employed their prior knowledge and self-regulated strategies to support their reading, corroborating the findings of Coiro and Dobler (2007). However, the way in which they operationalized “online reading” is questionable in that the primary texts to be read were designated for the participants. This largely ignored the active process of constructing a reading path, which has been noted as an essential component of ORC (Afflerbach & Cho, 2009; Cho, 2014; Cho & Afflerbach, 2017; Coiro, 2003; Konishi, 2003).

Other studies delved into the extent to which various individual variables influence strategy use during “L2 online reading.” These studies primarily relied on self-report questionnaires to compare the degree of strategy use between different reader groups. For instance, N. J. Anderson (2003) investigated whether the online reading strategies ESL readers utilize differ from those used by EFL readers. To this end, he adapted Sheorey and Mokhtari’s (2001) *Survey of Reading Strategies* (SORS) to the Internet context, which resulted in the *Online*

*SORS* (OSORS) that measures the use of global reading strategies, problem-solving strategies, and support strategies with 5-point Likert scale questions. This OSORS was administered to 153 EFL readers in Costa Rica and 116 ESL readers in the United States. Analysis of variance (ANOVA) for the three subcategories of the OSORS revealed that there was no significant difference in terms of strategy use between the two groups, except for problem-solving strategies that EFL readers relied more on.

Taki (2016) further modified the OSORS by reclassifying survey items and including new ones. He administered this survey to 52 Canadian college students and 38 Iranian university students to examine the extent to which there was a difference in strategy use when English was read online as an L1 as opposed to an L2. While the ANOVA results indicated that the Canadian students reported having used significantly more reading strategies, this seemed to be due to a preexisting difference in the disposition of the two groups; the strategy use reported by the Iranian students after reading online in their L1 (i.e., Farsi) was not significantly different from their L2 English online reading strategy use.

Huang et al. (2009) took a unique approach to gauging the online reading strategy use of Taiwanese college students by developing a computer program titled *English reading online*, which provided a supportive reading environment for EFL readers. That is, the software featured 15 strategy buttons along with the

text that readers can click for support (e.g., clicking the *Outline* button presents the text in an outline format). The frequency of the readers' clicks were simultaneously tracked by the software to provide a measure of strategy use. Thirty Taiwanese students were separated into two groups according to English proficiency and were assigned two sets of texts that varied in difficulty to read on *English Reading Online*. A series of chi-square tests revealed that while the two reader groups did not differ in terms of strategy use when they read the less difficult texts, the higher proficiency group used global strategies more frequently and the lower proficiency group used socio-affective strategies more frequently when they read the more difficult texts.

These studies on L2 ORC, while providing insight into how individual learner variables such as their environment of study and English proficiency impact reading strategy use, remain limited in that they relied excessively on self-report data without administering tasks to elicit the use of strategies necessary for L2 ORC. For example, in N. J. Anderson's (2003) study, the OSORS was administered to students after their regular English classes without any task whatsoever. Huang et al. (2009) and Taki (2016) directed their participants to read a designated set of texts, which again fails to capture the strategies readers utilize to construct their reading paths. Another issue underlying studies on L2 ORC is the lack of comprehensiveness in their categorization of reading strategies; most studies (N. J. Anderson, 2003; Huang

et al., 2009; Konishi, 2003; Taki, 2016) adapted strategy categories from work on traditional print-based L1 reading, which did not take into consideration the strategies required for hypertext or multiple text reading.

These imminent gaps in the literature necessitate further studies into L2 ORC that operationalize research procedures that better replicate actual L2 ORC. The current study aims to serve as an exploratory study in this regard by administering a task that maintains more authenticity of L2 ORC and grounding the analysis within the framework of constructively responsive reading, which has synthesized decades of reading strategy research.

## **Chapter 3. Methodology**

The purpose of this study is to examine the strategies utilized by Korean learners of English engaged in an L2 ORC task in English. To this end, six Korean tertiary-level learners of English participated in an L2 ORC task and a subsequent post-task interview. Screen recording of the participants' L2 ORC sessions and voice recording of the post-task interviews formed the primary source of data for this study. Outlined in this chapter is the entire process of research conduction, including participant selection, data collection, data analysis, as well as ethical considerations for human participants.

### **3.1 Participants**

#### **3.1.1 Preliminary Screening Survey**

Six Korean tertiary-level learners of English enrolled at an elite university in Seoul, South Korea participated in the current study. These participants were recruited and selected based on responses to a preliminary screening survey that included questions about individual variables that were expected to influence the process and outcome of L2 ORC. These variables are general English language proficiency, Internet usage, and prior knowledge about the topic of the L2 ORC task (refer to Appendix B for the translated version of the complete survey).

First of all, general English proficiency was considered as it was thought a minimum level of reading ability was necessary in order to comprehend and

report content from English web pages. English proficiency was gauged through English proficiency test scores the participants held at the time of study, regardless of type (e.g., Test of English as a Foreign Language [TOEFL] and Test of English Proficiency Developed by Seoul National University [TEPS]) and time of test administration. In addition, the participants were asked if they had any academic experience in an environment where English was the primary medium of instruction (e.g., study abroad, international school, and exchange student), which could have significantly impacted their English proficiency.

The subsequent variable examined was Internet usage, both in terms of time and purpose. It was thought that participants with more exposure to the Internet on a regular basis would be more familiar with the L2 ORC task to be administered in this study. Survey questions regarding Internet usage were adapted from MSIT and KISA's (2018) *2017 Survey on Internet Usage*. This survey classified the purpose of Internet use into the six main categories of *communication, obtaining data and information, leisure, operating web pages, education/learning, and job/work-related*. It also measured the total time of weekly Internet use in 7-hour intervals (e.g., *14-21 hours per week*), which was also adopted in the current study. Insofar the focus of the current study is ORC in a second language, an additional set of survey questions had to be developed to examine Internet usage in English. To this end, the researcher created two separate sets of questions addressing Internet usage in Korean and in English

based on MSIT and KISA (2018). In the process, as Korean learners of English were expected to use the Internet less in English, the interval for the total time of weekly Internet use in English was adjusted to three hours (e.g., *6-9 hours per week*).

Finally, the level of prior knowledge about the topic of the L2 ORC task had to be controlled in order to minimize its influence on the process of ORC. The new literacies of ORC is conceptualized as a problem-based inquiry (Leu et al., 2004, 2007, 2013, 2016; Leu, Forzani, et al., 2015; Leu, Zawilinski, et al., 2015), meaning that readers initiate ORC in want of certain knowledge, data, or information. Furthermore, as has been noted in the field of reading comprehension, a high level of prior knowledge about the topic of the text helps both active inference-making (Afflerbach, 1990a; R. C. Anderson & Pearson, 1984) and the automatic construction of its main idea (Afflerbach, 1990b). Therefore, for a clear picture of strategy use linked to typical L2 ORC, it was imperative that the task directed participants to search for information that they had little or no prior knowledge about. To address this issue, a question asking participants to denote their level of prior knowledge about the topic of the L2 ORC task on a 7-point Likert scale (1 = *know nothing*, 4 = *know somewhat*, 7 = *know very well*) was included in the survey.

### **3.1.2 Participant Selection**

The survey questions outlined in section 3.1.1, together with a consent

form as well as questions on basic biographical information such as major, year of study, and gender, were made available in online format. The complete online survey was included in a research subject recruitment post on a bulletin board of one university's online community. The rationale behind recruiting tertiary-level learners of English for this study lies in their higher potential for successful L2 ORC. In other words, tertiary-level students were expected to have a higher level of English proficiency and more experience on the Internet compared to elementary- or secondary-level students, thereby being more competent for the L2 ORC task designed for this study. As a goal of the present study was to delve into strategies behind successful L2 ORC, tertiary-level students were considered for participation.

The researcher initially collected responses from 30 potential participants on a first-come-first-served basis. From this pool, six participants were then sampled based on one criterion linked to prior knowledge; all participants needed to have minimal prior knowledge about the topic of the task for the reasons outlined in the previous section. In accordance to this criterion, only participants that responded with either 1 or 2 to the 7-point Likert scale survey question "How well do you know about fiat currency and cryptocurrency?" were considered for participation. Besides this minimal criterion, the researcher sought a varied sample that would demonstrate diverse L2 ORC strategy use based on other individual variables included in the preliminary survey (i.e.,

gender, major, year of study, general English proficiency, and Internet usage).

The individual profiles of the six participants of the current study are outlined in Table 3.1.

## **3.2 Data Collection**

### **3.2.1 L2 ORC Task**

While designing the L2 ORC task, a few factors were taken into consideration to effectively elicit strategy use from the participants. First of all, to bridge the gap in the extant literature on L2 ORC, efforts were made to develop a task that replicates authentic L2 ORC as closely as possible. In other words, the task should not direct participants to visit a designated set of web pages to locate information; the participants should instead initiate the search and navigate through hyperlinks in order to evaluate and synthesize information. In accordance with such conceptualization of ORC (Leu et al., 2004, 2007, 2013, 2016; Leu, Forzani, et al., 2015; Leu, Zawilinski, et al., 2015),<sup>3</sup> a task that requires more higher-order thinking—rather than simply locating factual information—was designed for the current study.

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<sup>3</sup> However, in order to control the participants' level of prior knowledge and obtain comparability across participants, the information to be sought during the L2 ORC task had to be designated. This made it difficult to incorporate the “identifying a problem” phase of ORC into the L2 ORC task of the current study.

Table 3.1

*Individual Profiles of the Participants*

Participant <sup>a</sup>	Gender	Major <sup>b</sup>	Year of study	General English proficiency	English-medium academic experience	Weekly Internet use in Korean	Weekly Internet use in English	Level of prior knowledge <sup>c</sup>
Jiwoo	Female	Gender studies	Completed master's coursework	TEPS 705	5 months	7-14 hours	Less than 3 hours	1
Seunghoon	Male	Electrical and computer engineering	Senior	TEPS 664	None	21-28 hours	Less than 3 hours	2
Minseo	Female	Economics	Junior	TEPS 680	None	More than 35 hours	Less than 3 hours	2
Kyungmin	Male	English literature	3 <sup>rd</sup> semester of master's coursework	TEPS 970	30 months	7-14 hours	12-15 hours	1
Youngmi	Female	French language education/international relations	Senior	TEPS 910	5 months	14-21 hours	More than 15 hours	2
Taeyeon	Female	Linguistics/social welfare	Senior	TEPS 931	6 months	7-14 hours	Less than 3 hours	2

Note. TEPS = Test of English Proficiency Developed by Seoul National University.

<sup>a</sup> All names are pseudonyms.

<sup>b</sup> The participants were also asked to indicate any minors or double-majors.

<sup>c</sup> These are responses to the 7-point Likert scale survey question "How well do you know about fiat currency and cryptocurrency?" (1 = *know nothing*, 4 = *know somewhat*, 7 = *know very well*).

Nonetheless, some constraint was also necessary in order to meet the research objectives of this study. First, as the focus of this study is ORC in a second language, the participants were directed to search for and read only web pages in English. They were, however, given the freedom to utilize online resources (e.g., online dictionaries and translators) as necessary, which made it further resemble the L2 ORC participants are likely to typically conduct in their everyday lives. Second, albeit less authentic in nature, a 20-minute time limit was also included to control how long the participants conducted L2 ORC. This was largely due to the indeterminate nature of the text on the Internet; without a definite “endpoint of the text,” participants could report they had finished the task without demonstrating sufficient L2 ORC to be analyzed. Conversely, they could also continue their L2 ORC for a prolonged amount of time, which would make the subsequent stimulated recall interview excessively burdening for the participant.

Finally, a comprehension task asking participants to verbally explain what they have learned about the topic as a result of their search was included as part of the L2 ORC task. The purpose of this comprehension task was twofold; one was to keep the participants actively engaged in L2 ORC, and the other was to assess how well the participants completed it. It was expected that contrasting the strategy use of more successful participants to that of less successful participants would further shed light on the nature of L2 ORC and the strategies

it requires.

Based on these theoretical and practical considerations, the following task prompt was designed for this study:

You will now have about 20 minutes to conduct an Internet search on the difference between fiat currency and cryptocurrency.<sup>4</sup> Based on the results, you need to explain to me the difference you found in Korean. While you can read only web pages in English, you are allowed to use online dictionaries or translators if necessary. You can organize the content you found either on this paper hand-out or on a word processor like Microsoft Word and refer to it when you explain to me the difference between fiat currency and cryptocurrency. Please use the 20 minutes to its fullest for a complete answer.

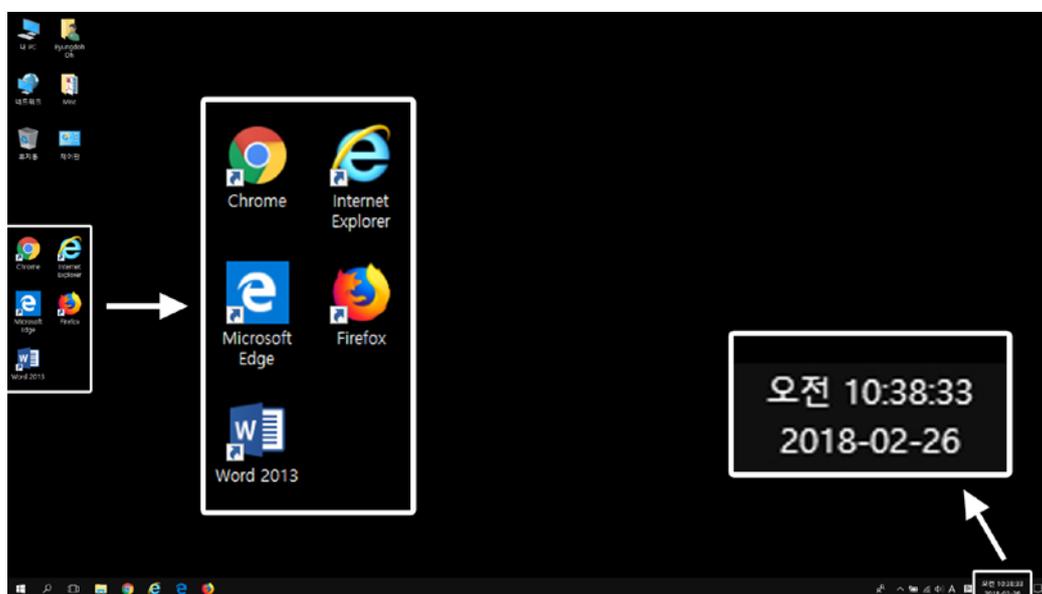
The topic of fiat currency and cryptocurrency was chosen since it had been receiving an increasing amount of attention during the time of research. Such a recent topic for which the Internet remains as a primary source of information was thought of as more appropriate for an ORC task.

During the main phase of data collection, each participant individually met the researcher in a quiet environment in order to engage in the L2 ORC task. First, the researcher read out the task prompt to the participant, clarifying any portions of it as requested. The researcher directed the participant to be aware of the 20-minute time limit, also pointing out the system clock located on the bottom right-hand corner of the computer screen. The participant then initiated the L2 ORC task using the researcher's laptop computer (Samsung NT500R5K-

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<sup>4</sup> Although the entire task prompt was presented to the participants in Korean, the key terms *fiat currency* and *cryptocurrency* were provided in English in parentheses next to their Korean equivalents.

K38D) and wireless mouse (Logitech M705). The participant started on the desktop screen of the computer, on which shortcut icons for four major web browsers (i.e., Chrome, Internet Explorer, Microsoft Edge, and Firefox) and Microsoft Word 2013 were located (see Figure 3.1). For each web browser, accommodations were made so that the participant's L2 ORC session would not be influenced by any of its settings. First, the default opening page for all browsers was set to a blank page (about:blank) in order to not lead the participant towards any particular search engine or website. On a similar note, all past browsing history, cookies, and autocomplete/autofill data were also cleared before each L2 ORC session. Moreover, no additional extension or add-on tools were installed for any of the four browsers.



*Figure 3.1.* Initial desktop screen for the L2 ORC task. The system clock on the screen had been configured to display seconds as well.

While the participant conducted L2 ORC, the entire computer display was recorded using OBS Studio version 21.0.1 (<https://obsproject.com/>). The researcher also observed the process from a distance and took notes on any peculiarity or ambiguity that required further explanation from the participant. After the 20 minutes had passed, the participant was directed to stop the L2 ORC<sup>5</sup> and then verbally explain what they found out about the difference between fiat currency and cryptocurrency, referring to the notes they had taken during the L2 ORC session. The participant's response to this comprehension task was recorded using the researcher's mobile phone.

### **3.2.2 Post-task Interview**

After the participant completed the L2 ORC task, they took part in a post-task interview in which they were asked to recall their thought process during the L2 ORC session. Such stimulated recall, rather than the think-aloud protocol in which a participant concurrently verbalizes their thought while reading (Hilden & Pressley, 2011), was opted for in this study for two reasons. One concern was that an excessive amount of cognitive load would be imposed on the participants by the think-aloud protocol and thereby adversely influence their natural flow of L2 ORC. The other rationale behind this decision was to keep the participants' L2 ORC sessions "time-sensitive" without interference from the verbal protocol,

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<sup>5</sup> However, upon request, the participants were allotted 1-2 minutes of extra time to finish up whatever they were doing (e.g., reading the web page they were on or organizing their notes).

so that the participants' actions during the L2 ORC sessions (e.g., choosing a web page from the search results) could be analyzed in light of the time elapsed.

The post-task interview took place in three phases, during which the screen recording and the researcher's observation of the participant's L2 ORC session served as cues. First, the researcher asked the participant whether they had developed a broad plan of how to approach the task upon seeing the prompt. This stage roughly outlined the actions that were captured in the screen recording of the L2 ORC session. After the participant explained their broad approach to the L2 ORC task, they were directed to verbalize their thought process while watching the screen recording of their L2 ORC session. More specifically, the researcher gave the following instructions in Korean and began watching the screen recording together with the participant:

We will now watch together the screen recording of your web search session. While watching the video, freely say out loud what came to your mind while you engaged in the search. Please mention why you entered a certain search term, why you selected a certain web page, and exactly where on each web page you read in order to obtain the information you needed.<sup>6</sup> I will also ask additional questions during the video if necessary.

Although Hilden and Pressley (2011) recommend keeping instructions for verbal protocols general in order not to bias the participants' processing,

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<sup>6</sup> This explicit direction was included in order to mitigate the inherent drawbacks of screen recording. That is, while screen recording can capture the search terms entered and the web pages accessed, it cannot tell us why the participant chose them; similarly, screen recording provides no evidence of exactly where on each web page the participant was focusing on during the L2 ORC session.

directions such as the third sentence above could be incorporated for more in-depth data because the reading had already taken place prior to the interview. Moreover, whenever the participant remained silent for a prolonged span of time, the researcher described the action playing on screen and asked for the participant's rationale behind it (e.g., "You just accessed page 2 of the search results and scrolled down to access a HuffPost article on the topic. What made you select that web page?"). The researcher made effort to remain nondirective and neutral, only mentioning actions that were clearly evident in the screen recording. Furthermore, whenever the participant actively verbalized their thought process, the researcher paused the screen recording accordingly and let them fully elaborate on it.

After the screen recording finished playing, the researcher concluded the post-task interview with three general questions about the participant's Internet usage based on their responses to the preliminary screening survey. These questions primarily focused on the relationship between their L1 (i.e., Korean) and L2 (i.e., English) on the Internet. The first question concerned whether the participant had any preference for a certain language when engaging in a web search. If the participant mentioned preference for using English in a particular situation, a follow-up question regarding whether there were cases where they concurrently use Korean and English in a same search session was asked. The second question was more pertinent to Internet use in general; the participant

was asked for their language preference when using the Internet for purposes other than information search. The last question delved into the potential influence of the design of the L2 ORC task. The participant was asked if they found the L2 ORC task they had just completed to be either similar or different to the L2 ORC they usually conduct and why.

The entire post-task interview, which lasted for about 25 minutes for each participant, was voice-recorded for future analysis. This concluded the data collection procedure, which is illustrated in Figure 3.2.

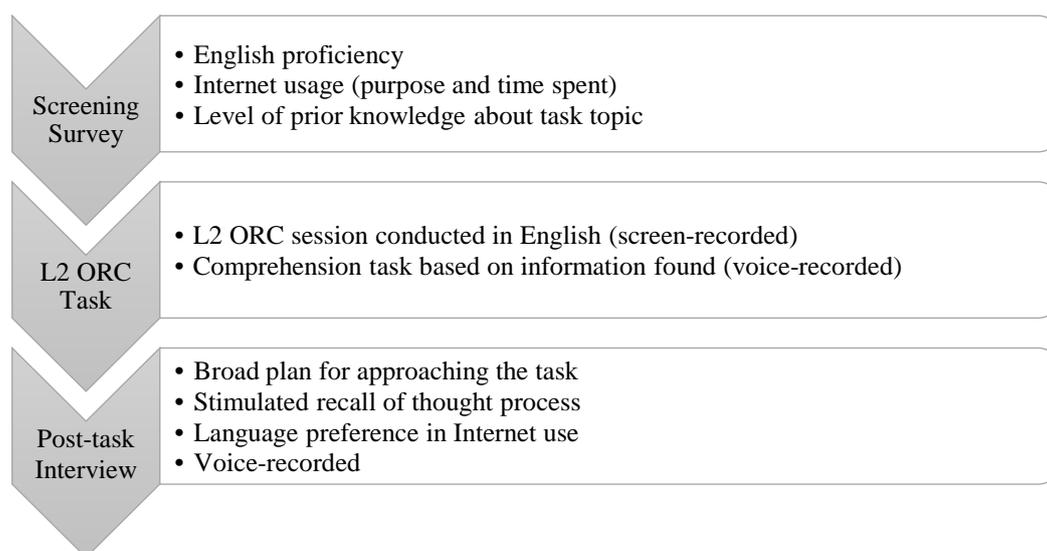


Figure 3.2. Overall sequence of data collection.

### 3.3 Data Analysis

The data collected through the procedures outlined in the previous section were analyzed in three phases: (a) data transcription, (b) analysis of the outcome of L2 ORC, and (c) analysis of strategy use behind L2 ORC. First, the

participants' responses to the comprehension task, the screen recordings of the L2 ORC sessions, and the post-task interview sessions were transcribed. Subsequently, the outcome of each participant's L2 ORC was analyzed in terms of the idea units contained in their response to the comprehension task and the web pages accessed during their L2 ORC session. Finally, the transcripts of the screen recordings and the stimulated recall sessions were triangulated in order to infer the participants' strategy use during their L2 ORC sessions. The combination of the two sets of transcripts were analyzed in a recursive manner to identify and categorize strategies demonstrated by each participant. This data was then complemented by other data from the screening survey and the post-task interview for a descriptive case analysis of the participants' L2 ORC.

### **3.3.1 Data Transcription**

The voice recordings of the responses to the comprehension task were first transcribed for analysis. Because the primary goal of analyzing the responses was to examine what information each participant was able to learn as a result of their L2 ORC, pause time, intonation, and nonverbal utterance were not included in the transcriptions.

Subsequently, the screen recordings of the participants' L2 ORC sessions were parsed out into actions visible on screen, such as entering a search term and opening a web page. A preliminary analysis of the screen recordings also revealed that all six participants had a tendency to hover their mouse cursors

along the text on each web page, which made it possible to tentatively make note of exactly where they were reading. On a similar note, rapid downward scrolling within a web page suggested the portions they paid less attention to. These actions were grouped together according to the window (i.e., a web browser tab or Word document) the participant was focusing on during their L2 ORC session. In addition, time stamps indicating the time the participant spent on each window were included in the list. This resulted in an action timeline of each participant's L2 ORC session; a short excerpt from that of one participant is illustrated in Figure 3.3 below.

<b>Time</b>	<b>Web page</b>	<b>Actions</b>
00:14-00:36	Google	Entered search term <i>fiat currency vs. cryptocurrency</i> and opened Cryptocurrency Facts page
00:36-02:00	"The Difference Between Fiat Currency and Cryptocurrency" (Cryptocurrency Facts)	- Read the two bullet points
		- 01:01, opened Word document
		- Copied the two bullet points
02:00-02:05	Word document	Pasted what was copied into Word document
02:05-02:42	"The Difference Between Fiat Currency and Cryptocurrency"	Read the two bullet points

Figure 3.3. Sample action timeline of L2 ORC session.

The voice recordings of the post-task interview between the researcher and each participant were also transcribed for analysis. Again, as the main objective of analyzing the interview sessions was to identify the strategies used by each participant during their L2 ORC session, pause time, intonation, and

nonverbal utterance were not included in the transcriptions. As the post-task interview consisted of three portions (i.e., broad plan for the task, stimulated recall of thought process, and language preference in Internet use), the transcriptions were separated accordingly into three sections.

### 3.3.2 Outcome of L2 ORC

First, in order to analyze how much information each participant was able to verbalize after the L2 ORC session, each transcribed response to the comprehension task was first parsed into idea units,<sup>7</sup> a unit of analysis for spoken discourse developed by Kroll in 1977 (as cited in Crookes, 1990). These idea units were then examined by the researcher based on the criteria of relevance and accuracy; any irrelevant or false idea units were excluded from further analysis. Moreover, any repetitive (i.e., highly synonymous) idea units in each response were only counted once. The remaining idea units were then tallied for a count of total idea units in each response.

In addition, as an approximate measure of the amount of text the participants processed during their L2 ORC sessions, the number of web pages accessed by each participant was counted as well. Only “content” web pages

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<sup>7</sup> Kroll’s (1977) original definition of an idea unit (see Crookes, 1990, pp. 184-185) seems to apply largely to the English language, as is evident in its linguistic terminology like *relative pronoun* and *post-nominal -ing phrases*. In order to analyze verbal data in Korean from this perspective, the researcher sought to identify idea units based on the most prototypical instance of “a subject and verb counted as one idea unit together with (when present) a (a) direct object, (b) prepositional phrase, (c) adverbial element, or (d) mark of subordination” (Crookes, 1990, p. 184) among the seven instances outlined in the original definition.

were considered; that is, search engines (e.g., Google) and online resources (e.g., online dictionaries and translators) were excluded from count. Furthermore, multiple visits to the same web page were only counted once.

### **3.3.3 Strategy Use Behind L2 ORC**

Firstly, the action timeline of each participant's L2 ORC session was combined with verbal data from the stimulated recall session that took place as part of the post-task interview. Although the participants did not concurrently verbalize their thought process while engaging in the task, it was possible to fit the verbal data into corresponding cells of the action timeline, as actions visible on screen recording served as cues for the stimulated recall session. In the process, tentative judgements regarding exactly which portions each participant read were also confirmed or revised. Such integration of the actions and their underlying thought process resulted in a data set from which strategy use could be inferred (see Figure 3.4 for sample excerpt).

Afterwards, the researcher tried to identify and categorize strategies based on the action-recall combinations, referring to the model of constructively responsive reading and its catalogue of strategies developed by Afflerbach and colleagues (Afflerbach & Cho, 2009; Cho & Afflerbach, 2017; Pressley & Afflerbach, 1995). The most recent work by Cho and Afflerbach (2017) applied the model specifically to the reading that takes place on the Internet, categorizing strategies required for (a) comprehending a single digital text, (b)

comprehending multiple digital texts, and (c) the construction of reading paths (see Appendix A). Cho and Afflerbach’s (2017) catalogue was adopted as the coding scheme for the current study, mainly due to its comprehensiveness and high relevance to ORC. Throughout recursive rounds of analysis, strategies that could be inferred from the action-recall combinations were categorized according to this coding scheme. In the process, the researcher also remained open to novel strategy use that may be specific to the “second language” nature of ORC investigated in this study.

Time	Web page	Actions	Stimulated recall
00:14-00:36	Google	Entered search term <i>fiat currency vs. cryptocurrency</i> and opened Cryptocurrency Facts page	R: 말씀하신 대로 vs를 포함하신 검색어를 넣으셨는데, 두 번째 사이트를 선택하셨어요. P: 첫 번째가..그니까 이게 제일 제가 원하는 타이틀이라 클릭했던 것 같아요. R: 네, 뭐..the difference between.. P: 제일 정리가 돼 있을 것 같아서..약 표로 정리를 해놨길래.. R: 밑에 내려서 bullet point 두 개가 나오니까.. P: 네, 이거를 읽었고.. R: 여기서 좀 꼼꼼히 읽으셨던 것 같고요. P: 네, 처음에 들어간 거라, 뭘 소리 하고 있나 했던 것 같아요.
00:36-02:00	"The Difference Between Fiat Currency and Cryptocurrency" (Cryptocurrency Facts)	- Read the two bullet points	
		- 01:01, opened Word document	R: 그 다음에 이것을 통째로 복사해서 입력을 하셨고.. 이 첫 번째 페이지에서 어떤 차이점을 좀 발견을 하셨나요?
		- Copied the two bullet points	P: 일단 따옴표되어 있는 걸 중점으로, 애가 government, 정부가 발행하는지 안 하는지, 이거를 봤던 것 같고..
02:00-02:05	Word document	Pasted what was copied into Word document	
02:05-02:42	"The Difference Between Fiat Currency and Cryptocurrency"	Read the two bullet points	

Figure 3.4. Sample action timeline of L2 ORC session combined with stimulated recall data. *R* and *P* in the rightmost column stand for *researcher* and *participant* respectively.

### **3.4 Ethical Considerations**

According to the guidelines from the researcher's institutional review board (IRB), the researcher received prior approval for the present study (IRB No. 1706/001-018). Before both the screening phase and the main phase of data collection, consent from every participant was obtained by the researcher. For the screening phase, a written explanation describing the purpose and design of the study, followed by a question asking for the participant's consent, was included as part of the preliminary screening survey mentioned in section 3.1.1. Accordingly, a waiver for written consent was also obtained from the researcher's IRB, as the survey was disseminated through an online bulletin board. To the six participants that took part in the main phase of data collection, the researcher explained the purpose and design of the study and received written consent prior to administering the L2 ORC task. In addition, all participants were notified of their right to withdraw from the study at any time. Once data collection was complete, screening survey responses from the 24 participants that were not chosen for the main phase of data collection were deleted immediately. Furthermore, the researcher submitted a completion report to their IRB, reporting no digression from the proposed research design, no unexpected side effects, and no complaints from the participants.

## Chapter 4. Results

This chapter presents the results of the qualitative analyses conducted in order to address the following research question: *What strategy use is observed from Korean tertiary-level EFL learners conducting L2 ORC in English?* The results from the L2 ORC task and the subsequent post-task interview are outlined in three sections. First, the outcome of L2 ORC conducted by the six participants are briefly analyzed in terms of idea units verbalized and web pages accessed. Second, detailed descriptive accounts of each participant's L2 ORC—coupled with verbal data from the stimulated recall sessions—are provided. Finally, themes of strategy use that emerged from the six participants' L2 ORC are discussed.

### 4.1 Outcome of L2 ORC

The outcome of the six participants' L2 ORC sessions were analyzed with the goal of roughly distinguishing participants who completed the task more adeptly from those that did not. Estimating the relative level of task completion by the participants in this study served two purposes. First, it provided additional information that complemented the accounts of the participants' L2 ORC sessions to be presented in the following section. Moreover, by contrasting more successful participants to less successful ones, it was possible to grasp a general understanding of the knowledge and strategies required for more successful L2 ORC.

The analysis of the idea units verbalized and web pages accessed revealed an interesting pattern of individual difference; while the idea units verbalized and web pages accessed varied in quantity, they were rather similar in terms of quality. That is, during the 20 minutes they were given to engage in L2 ORC, the participants accessed anywhere from four to 11 web pages. Such a wide gap was observed in the number of idea units verbalized as well, which ranged from 12 to 33 idea units. The number of idea units verbalized and web pages accessed by each participant is outlined in Table 4.1.

Table 4.1

*Number of Idea Units Verbalized and Web Pages Accessed by Each Participant*

Participant	Number of idea units verbalized	Number of web pages accessed
Jiwoo	14	4
Seunghoon	12	9
Minseo	26	4
Kyungmin	19	9
Youngmi	30	7
Taeyeon	33	11

Nonetheless, there was significant commonality in both the idea units verbalized and the web pages accessed by the six participants. Of the 135 total non-repetitive idea units in the six responses to the comprehension task, only one idea unit (i.e., “It [cryptocurrency] is also backed by a government or bank”) was excluded due to its falsity. Otherwise, all the other idea units verbalized by the participants were highly relevant to the task topic—the concept of fiat currency

and cryptocurrency as well as the difference between the two—and also accurate.

This observed similarity appeared to stem from the overlap in the information space explored by the participants. That is, all six participants chose Google as their primary search engine, entered synonymous key words to initiate their search, and accessed coinciding sets of web pages<sup>8</sup> to obtain the required information. For example, all six participants accessed a web page titled “The Difference Between Fiat Currency and Cryptocurrency” (<https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/>), and four of the six participants accessed the web pages “Fiat Currency Vs Digital Currency” (<http://digitalmoneytimes.com/fiat-currency-vs-digital-currency/>) and “There’s a Big Difference Between Electronic Fiat and Cryptocurrency” (<https://news.bitcoin.com/big-difference-electronic-fiat-cryptocurrency/>).

Such similarity further shed light on the characteristic of the participant sample. The fact that all six participants were able to locate relevant web pages and accurately comprehend information from them without being disoriented by the task demands suggests that they all possessed L2 ORC ability minimally required to complete the task designed for the current study. Therefore, the

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<sup>8</sup> Refer to Appendix C for complete titles and addresses of the web pages accessed by each participant.

quantity of idea units verbalized and web pages accessed presented in Table 4.1 should be understood in this light—as a rough guide of who was able to achieve more than what was required within the time limit.<sup>9</sup>

## **4.2 Descriptive Accounts of the L2 ORC Sessions**

In this section, descriptive accounts of each participant's L2 ORC session are presented. Each of the following subsections consists of four parts. First, in-depth details about the participants' Internet usage, including any language preference between Korean and English are provided. Second, each participant's broad plan for approaching the L2 ORC task and their thoughts about the nature of the task are summarized. Third, an action timeline that outlines all the web pages the participant accessed as well as the actions taken there is presented. This serves as an advance organizer for the last portion, in which the participant's L2 ORC session is described in more detail, together with verbal data from the stimulated recall session.

### **4.2.1 Jiwoo: Active Use of Online Translator**

Jiwoo, a female student who has completed her master's coursework in gender studies, reported she uses the Internet between seven to 14 hours in Korean and less than three hours in English on a weekly basis. She almost

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<sup>9</sup> The fact that the text each participant actually read varied made it difficult to judge which idea units were more or less "important" in light of the task demands and thus determine who completed the task more successfully.

always relies on Korean when searching for information on the Internet; the two exceptions to this case are closely related to her academic study. She occasionally looks up English expressions and collocations to check how widely they are used by native speakers of English. Furthermore, whenever she comes across an unfamiliar concept while reading academic book chapters or journal articles in English, she would look up its definition in English. Besides these search-related purposes, she spends most of her time on the Internet on social media such as Instagram, Facebook, and blogs. Again, while most of this social media use takes place in Korean, she noted that she would sometimes read English news articles on her timeline if they seemed interesting.

Jiwoo reported that when she was given the directions for the L2 ORC task, she first thought that she could find the required information by entering the two key words together as a search term. She then thought, because the L2 ORC task specifically asked for the difference between the two concepts, she would also include the word *difference* in the search term. In retrospect, she noted that the task was somewhat demanding for her because she had minimal prior knowledge about fiat currency and cryptocurrency. She also expressed the pressure she felt after about 10 minutes into her L2 ORC session due to the scarce amount of information she had found until then. She reported that this pressure led her to actively use an online translator to translate English text into Korean towards the end of her L2 ORC session.

This characterized Jiwoo’s L2 ORC session; because she had to rely on a less-than-perfect online translator to process the Internet text written in English, she had to stay on a same web page for an extended period of time to locate and synthesize the information that was required. The action timeline of Jiwoo’s L2 ORC session is presented in Table 4.2.

Table 4.2

*Action Timeline of Jiwoo’s L2 ORC Session*

Time <sup>a</sup>	Web page <sup>b</sup>	Actions
00:11-01:07	<b>Google</b>	Entered search term <i>fiat currency crypto currency difference [sic]</i> and opened Cryptocurrency Facts page
01:07-01:36	<b>“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)</b>	Read the topmost portion
01:36-02:04	<b>Naver</b>	Opened new tab and entered URL <i>www.naver.com</i>
02:04-02:08	“The Difference Between Fiat Currency and Cryptocurrency”	Quickly referred back to the page
02:08-02:20	Naver	Entered search term <i>legal tender</i> and read the preview of an encyclopedia entry from the search results
02:20-02:57	“The Difference Between Fiat Currency and Cryptocurrency”	Read the topmost portion
02:57-07:14	<b>Word document</b>	Opened Word document, took notes while displaying Cryptocurrency Facts page simultaneously on screen
07:14-07:31	Google	Entered search term <i>google translate</i>
07:31-07:38	“The Difference Between Fiat Currency and Cryptocurrency”	Copied the first sentence of the first bullet point on the web page
07:38-07:41	<b>Google search results: google translate</b>	Pasted what was copied into the Google Translate text box
07:41-07:52	Word document	Modified notes based on translation results

(continued)

Time <sup>a</sup>	Web page <sup>b</sup>	Actions
07:52-08:21	Google	Entered search term <i>fiat currency cryptocurrency difference</i> and opened Quora page but exited right away
08:21-09:16	Google	Entered search term <i>fiat currency cryptocurrency difference</i> and opened Digital Money Times page
09:16-09:36	<b>“Fiat Currency Vs Digital Currency” (Digital Money Times)</b>	Read the topmost portion
09:36-10:06	Word document	Took notes based on Digital Money Times page
10:06-10:19	“The Difference Between Fiat Currency and Cryptocurrency”	Read the two bullet points on the page and copied <i>bank credit or bonds</i>
10:19-10:26	Google search results: <i>google translate</i>	Pasted what was copied into the Google Translate text box
10:26-10:37	Word document	Took notes based on Cryptocurrency Facts page
10:37-12:29	“Fiat Currency Vs Digital Currency”	Read the “The Downfall of Centralized Currency” section and copied the entire section
12:29-13:14	Google search results: <i>google translate</i>	Pasted what was copied into the Google Translate text box and read the results
13:14-13:17	Google search results: <i>fiat currency cryptocurrency difference</i>	Opened Quora page
13:17-13:59	<b>“What’s the difference between fiat and cryptocurrencies?” (Quora)</b>	Read the topmost portion
13:59-14:26	Word document	Took notes based on Quora page
14:26-15:50	“What’s the difference between fiat and cryptocurrencies?”	Read points 1 and 2 of the first answer on the page
15:50-16:04	Word document	Modified notes based on Quora page
16:04-17:17	“What’s the difference between fiat and cryptocurrencies?”	Read from the fourth paragraph of the first answer and copied the fourth and fifth paragraphs of the first answer
17:17-17:49	Google search results: <i>google translate</i>	Pasted what was copied into the Google Translate text box and read the results
17:49-18:07	Google search results: <i>fiat currency cryptocurrency difference</i>	Opened HuffPost page
18:07-19:11	<b>“Are Cryptocurrencies Just More Fiat Money?” (HuffPost)</b>	Read the topmost portion and copied the first two paragraphs

(continued)

Time <sup>a</sup>	Web page <sup>b</sup>	Actions
19:11-19:45	Google search results: <i>google translate</i>	Pasted what was copied into the Google Translate text box and read the results
19:45-20:01	Word document	Modified notes based on translation results
20:01-21:40	Google search results: <i>google translate</i>	Read both the English text that was entered and the Korean translation results
21:40-21:58	Word document	Modified notes based on translation results and copied a portion of the results into the notes

<sup>a</sup> As screen-recording began shortly before the participant began their L2 ORC session, the timeline does not start at 00:00. Furthermore, the time intervals were separated whenever a new web page or the participant's notes were fully loaded on screen; that is, the time taken to load a new web page is included towards the end of the previous time interval. This convention applies to all the action timelines in this chapter.

<sup>b</sup> Web pages that the participant accessed for the first time during the L2 ORC session appear in boldface together with their website in parentheses. This convention applies to all the action timelines in this chapter. Refer to Appendix C for complete titles and addresses of the web pages accessed by each participant.

Jiwoo started her L2 ORC session by opening Chrome and accessing Google (<https://www.google.co.kr>), noting that she chose Google because the task directed her to search for web pages in English. After entering the search term *fiat currency crypto currency difference [sic]*, she opened a web page titled “The Difference Between Fiat Currency and Cryptocurrency” on Cryptocurrency Facts (<https://cryptocurrencyfacts.com/>). She recalled that she chose this web page due to the high relevance of the web page title to the task demands.

As she began to read from the topmost portion of the page, she referred to online dictionaries and translators in order to find definitions of words and phrases she did not understand. For example, she entered the search term *legal tender* into the Korean search engine Naver and read the preview of an encyclopedia entry written in Korean. She also copied an entire sentence from the web page and pasted it into Google Translate because she did not understand

the phrase *backed by central government*. Subsequently, she opened a Word document and began to take notes in Korean based on the information she had read from the web page. She juxtaposed this Word document and the web browser on the same screen and continuously referred back and forth between the two in order to update her notes. Such “recursive” reading of the first web page took place for about seven minutes before she exited the page.

In search of the next content web page, Jiwoo returned to Google and entered a nearly identical search term *fiat currency cryptocurrency difference*. She then opened a web page titled “What’s the difference between fiat and cryptocurrencies?” on Quora (<https://www.quora.com/>) but almost immediately closed the page. She recalled:

Jiwoo: I know that website [Quora] isn’t something like the news, but instead a site where people simply post their personal opinions. So I thought it might be better for me to look for something more trustworthy.<sup>10</sup>

She then returned to the same search results and opened a page titled “Fiat Currency Vs Digital Currency” on Digital Money Times (<http://digitalmoneytimes.com/>). She noted that even though she had not heard of the website before, she chose the page because *Digital Money Times* sounded trustworthy. After reading from the topmost portion and taking notes based on its content for about a minute, she returned to the first content web page she had

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<sup>10</sup> All of the verbal protocol excerpts presented in this chapter were translated from Korean to English by the researcher.

accessed (i.e., “The Difference Between Fiat Currency and Cryptocurrency”) and closely read the two bullet points that contrasted fiat currency and cryptocurrency. She recalled:

Jiwoo: As I was browsing, I remembered something that I hadn’t written down. Because this [the Digital Money Times page] talked about Bitcoins, I thought about the form of this [fiat currency]. I think that’s why I returned [to the Cryptocurrency Facts page].

After updating her notes from her second visit to the Cryptocurrency Facts page, she returned to the Digital Money Times page and started reading the “The Downfall of Centralized Currency” section located right under the introductory paragraph. She then copied the entire section, pasted it into Google Translate, and read the results. She mentioned that she had done so because she was not able to understand the contents of the section in English. She further noted that the translation result was also unsatisfactory and therefore she was not able to obtain much information from it.

Interestingly, the next web page Jiwoo opened was the Quora page she had rejected before reading the Digital Money Times page. When asked for the reason why, she responded:

Jiwoo: What I’ve just read [Digital Money Times page] was too difficult for me, and then I thought “wouldn’t something written by people have explained it more easily?” and opened this page again.

She then demonstrated a similar reading pattern to when she read the first content page (i.e., the Cryptocurrency Facts page); she started carefully reading from the topmost portion, taking notes and utilizing Google Translate as

necessary. She reported that she decided to translate entire paragraphs as she was running low on time.

The last web page Jiwoo opened was “Are Cryptocurrencies Just More Fiat Money?” on HuffPost (<https://www.huffingtonpost.com/>), which she noted was a familiar media platform to her. She began reading from the topmost portion and then copied the first two paragraphs to paste them into Google Translate. She recalled that she had skimmed the first few sentences of each paragraph for a general understanding before translating the paragraphs. She then updated her notes based on the translation results until the allotted time ran out.

#### **4.2.2 Seunghoon: Keen Understanding of Internet Text**

Seunghoon, a male student who is in his senior year in electrical and computer engineering, reported he uses the Internet between 21 to 28 hours in Korean and less than three hours in English on a weekly basis. While he mostly relies on Korean when searching for information on the Internet, he mentioned that he almost always conducts searches in English for explanations of terms and concepts related to his major, further noting the relative scarcity of such information in Korean. However, he reported that he would occasionally look for the same information in Korean whenever it was difficult for him to understand the material written in English. Aside from this search-related purpose, he uses the Internet solely in Korean, for example, to read sports-related news articles.

Seunghoon seemed rather familiar with the L2 ORC task that was administered; he noted that the search for the difference between two concepts is typical and that the search term in the form of *difference between A and B* usually yields satisfactory results. After he had completed the task, he reported that the task was very similar to the kind of search he has experience conducting; he initiated the search with the key words *difference between fiat currency and cryptocurrency* and was able to locate web pages that contrasted the two concepts. However, he also noted that the search results he had encountered during the L2 ORC session were slightly different in their content. That is, he reported that he saw more news articles during the task compared to his usual major-related information search, attributing this to the highly specialized nature of academic content.

Despite his intermediate-level general English proficiency (i.e., a score of 664 on the TEPS), Seunghoon demonstrated a wide range of strategy use that seemed to stem from his keen understanding of the characteristics of text on the Internet. The action timeline of Seunghoon's L2 ORC session is presented in Table 4.3.

Table 4.3

*Action Timeline of Seunghoon's L2 ORC Session*

Time	Web page	Actions <sup>a</sup>
00:20-01:05	<b>Google</b>	Entered search term <i>difference between fiat currency and cryptocurrency</i> and opened Cryptocurrency Facts page
01:05-01:59	<b>“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)</b>	Read the topmost portion and copied the first sentence
01:59-02:22	<b>Word document</b>	Opened Word document and pasted what was copied into Word document
02:22-03:24	“The Difference Between Fiat Currency and Cryptocurrency”	Read after the introductory sentence
03:24-03:32	Google search results: <i>difference between fiat currency and cryptocurrency</i>	Opened Bitcoin News page
03:32-06:36	<b>“There’s a Big Difference Between Electronic Fiat and Cryptocurrency” (Bitcoin News)</b>	Skipped over the first section, started reading from the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section, and copied the last sentence of the first paragraph of the “Censorship Resistance and Unstoppable Tax Protests” section
06:36-06:40	Word document	Pasted what was copied into Word document
06:40-07:26	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	Finished reading the page
07:26-07:40	Google search results: <i>difference between fiat currency and cryptocurrency</i>	Opened HuffPost page
07:40-12:13	<b>“Are Cryptocurrencies Just More Fiat Money?” (HuffPost)</b>	Read from after the introduction all the way to the end of the page
12:13-12:27	Google search results: <i>difference between fiat currency and cryptocurrency</i>	Opened Quora page
12:27-14:07	<b>“What’s the difference between fiat and cryptocurrencies?” (Quora)</b>	Read from the fourth paragraph of the first answer on the page and copied its last sentence
13:27-13:30	Word document	Pasted what was copied into Word document

(continued)

Time	Web page	Actions <sup>a</sup>
13:30-14:07	“What’s the difference between fiat and cryptocurrencies?”	Finished reading up to the second answer
14:07-14:17	Google search results: <i>difference between fiat currency and cryptocurrency</i>	Opened Steemit page
14:17-14:30	<b>“The difference between fiat and cryptocurrency” (Steemit)</b>	Scrolled through the page
14:30-14:38	Google search results: <i>difference between fiat currency and cryptocurrency</i>	- 14:31, opened page 2 of search results - Opened YouTube video
14:38-16:14	<b>“Crypto-currency vs Fiat currency” (YouTube)</b>	Paused at certain points to read the text on video and skipped over portions
16:14-16:21	Google search results: <i>difference between fiat currency and cryptocurrency</i>	Scrolled through page 2 of search results
16:21-16:44	Word document	Read over his notes
16:44-16:54	Google search results: <i>difference between fiat currency and cryptocurrency</i>	Opened Marketing in Digital Times page
16:54-18:09	<b>“The difference between cryptocurrencies, digital currencies, fiat currencies and tokens” (Marketing in Digital Times)</b>	Scrolled through the page
18:09-18:17	Google search results: <i>difference between fiat currency and cryptocurrency</i>	- 18:13, returned to page 1 of search results - Opened Core Sector Communique page
18:17-18:31	<b>“The Difference Between Cryptocurrencies, Digital Currencies and Fiat Currencies” (Core Sector Communique)</b>	Scrolled through the page
18:31-18:34	Google search results: <i>difference between fiat currency and cryptocurrency</i>	Opened Baseberry page
18:34-20:19	<b>“Cryptocurrency Vs Fiat (Cash money)” (Baseberry)</b>	Scrolled through the page

<sup>a</sup> Actions that were taken within the same search engine (e.g., opening another result page or revising the search term) and actions that did not result in a shift of the web page the participant was focusing on (e.g., opening another page in a new tab) are presented along with their time stamps in this column. This convention applies to all the action timelines in this chapter.

Seunghoon started his L2 ORC session by opening Chrome, noting that he usually uses Chrome because the Google search function built into its address bar is convenient. After entering the search term *difference between fiat currency and cryptocurrency* into the address bar, he opened a web page titled “The Difference Between Fiat Currency and Cryptocurrency” on Cryptocurrency Facts, which was the topmost page displayed on the search results. He reported that he usually chooses the topmost result except in cases where examining the source of information is especially important. He recalled:

Seunghoon: When one is looking for, for example, the GDP [gross domestic product] of a country, there is definitely an official source that releases that kind of information. So in cases like that I would prefer to access a page from that particular country. But in cases like this [the task] when I’m simply looking for some knowledge, I tend to visit the many foreign web pages that are like the Korean website Jisikin.<sup>11</sup>

He began to read from the topmost portion of the page, which contained the heading “What is Fiat Currency and How is it Different From Cryptocurrency?” He recalled his prior knowledge of the characteristics of Internet text that influenced his reading behavior:

Seunghoon: News articles usually start with a lengthy introduction that I tend to quickly go over and also have subheadings that I can skip to. But web pages that start with a question like this almost always directly present the answer to the question, so I read them from the top.

After reading the page for about a minute, he copied the first sentence on

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<sup>11</sup> Naver Jisikin (kin.naver.com) is a Korean website where users post questions and wait for answers from other users.

the page and pasted it into a Word document that he opened shortly afterwards. He thought that sentence summarized the difference between fiat currency and cryptocurrency well, which led to his decision to copy that sentence into his notes. He then returned to Cryptocurrency Facts and began reading the rest of the page for about a minute, reporting that its contents did not seem very relevant to the task.

The next web page he accessed from the search results was “There’s a Big Difference Between Electronic Fiat and Cryptocurrency” on Bitcoin News (<https://news.bitcoin.com/>). He skipped over the first section and started closely reading from the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section. He noted that he did so because the web page he was reading was a news article that had subheadings. Furthermore, he mentioned that the words *The Glaring Differences* drew his attention. Although he read the web page for about three minutes, he reported that he was not able to discover much new information. In the process, he mentioned that he had skipped a paragraph that he could not understand. He then came across a sentence that explained how cryptocurrencies can be used to avoid taxation, which he copied and pasted into the Word document. He reported that while he finished reading the page, he paid close attention to the last paragraph because it started with *There is a big difference*. However, he noted that he did not find much new information there either.

Seunghoon then opened an article titled “Are Cryptocurrencies Just More Fiat Money?” on HuffPost. He reported that he chose the web page because he had heard of the media platform, even though he does not usually access HuffPost during his searches. Again, he noted that he had skipped the introduction as he was reading a news article. Although he did not take any notes based on the contents of this page, he recalled that he had thought about the relationship between the two concepts; that is, whether fiat currency includes cryptocurrency or vice-versa.

He then returned to the search results and opened a web page titled “What’s the Difference Between Fiat and Cryptocurrencies?” on Quora. He began reading from the fourth paragraph of the first answer and copied its last sentence, which explained the etymology of the term *cryptocurrency*. After pasting it into the Word document, he finished skimming the rest of the page. The next web page he chose was “The difference between fiat and cryptocurrency” on Steemit (<https://steemit.com/>), but he quickly exited the web page after scrolling over it. He recalled:

Seunghoon: I skipped this page [Steemit page] because it was a page where people just posted their comments. [...] There wasn’t much text on the page, and there were a lot of short comments. So I exited because I didn’t think there would be much detailed explanation.

Afterwards, he opened a YouTube (<https://www.youtube.com/>) video titled “Crypto-currency vs Fiat currency.” At certain points, he paused to closely read the text presented on screen and also skipped over portions he thought were

redundant. He noted that he had realized at that point that there would probably be no more new information that could be found. He recalled:

Seunghoon: The same things—it is taxed, the government issues it, there is a bank, it is decentralized.. At this point I thought there probably wouldn't be any more new information. Everything I had seen up to this point had the centralized-decentralized distinction as the underlying context.

During the rest of his L2 ORC session, Seunghoon accessed three more web pages that he quickly scrolled through before exiting. He did not take any notes based on those web pages nor recall that he learned any new information from them.

#### **4.2.3 Minseo: Unexpected Influence of Prior Knowledge**

Minseo, a female student who is in her junior year in economics, reported she uses the Internet more than 35 hours in Korean and less than three hours in English on a weekly basis. She mentioned that when she searches for information on the Internet, the language she uses largely depends on the kind of information she is looking for. For example, she noted that she would look for information related to her everyday life such as the location of a famous restaurant or something she had felt curious about in Korean. In contrast, when she needs examples of a certain phenomenon from other countries besides Korea, she would search for relevant information in another language. Besides such search-related purpose, she uses the Internet mostly to watch videos; she reported that she watches short Korean television clips on Naver TV

(tv.naver.com) and also occasionally some Chinese television clips on YouTube.

Minseo recalled that she thought entering the two key words together in a search term would lead to web pages that contrasted them. Moreover, she mentioned that she wanted contents that were trustworthy and therefore accessed a Wikipedia (<https://www.wikipedia.org/>) page on cryptocurrency and an Investopedia (<https://www.investopedia.com/>) page on fiat currency. She reported that while she was reading information about fiat currency, its predecessor—the Bretton Woods system—came to her mind, which led her to quickly search for details on that as well. In retrospect, she noted that she was able to apply her usual search habits during the task, which was to start with a general key term and then specify the search as necessary.

What was interesting about Minseo’s L2 ORC session was the influence of her prior knowledge about the topic. Even though her response to the screening survey question “How well do you know about fiat currency and cryptocurrency?” was 2 on a 7-point scale, she seemed to have a substantial amount of prior knowledge about the topic, as evidenced by her verbalization during the stimulated recall session. This seemed to direct her complementary search about a relevant concept and also enable her to obtain more information from each web page she accessed. The action timeline of Minseo’s L2 ORC session is presented in Table 4.4.

Table 4.4

*Action Timeline of Minseo's L2 ORC Session*

Time	Web page	Actions <sup>a</sup>
00:14-00:43	<b>Google</b>	Entered search term <i>fiatcurrency cryptocurrency</i> [ <i>sic</i> ] and opened Cryptocurrency Facts page
00:43-07:59	<b>“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)</b>	<ul style="list-style-type: none"> <li>- Read the topmost portion</li> <li>- 01:07-01:26, opened Internet Explorer on the same screen, entered <i>네이버 사전</i> [Naver dictionary] in the address bar, and opened Naver Dictionary page in new tab from Bing.com search results</li> <li>- 01:34-01:45, opened Naver English Dictionary page and entered search term <i>legal tender</i></li> <li>- Started taking notes on paper hand-out while reading the page</li> <li>- 02:33-02:56, entered search term <i>backed by government</i> and scrolled through the results</li> <li>- 03:15-03:34, clicked “[동사] 뒤로 물러서다; 뒤로 가게하다 [[verb] move back; make one move back]” hyperlink under <i>back</i> entry and read the contents</li> <li>- 04:11-04:24, entered search term <i>bank credit</i> and read the results</li> <li>- 05:56-06:12, entered search term <i>sans</i> and read the results</li> <li>- 06:12-06:29, entered search term <i>sans the bank</i> and read the results</li> <li>- 06:29-06:40, entered search term <i>bank credit sans</i> and read the results</li> <li>- 07:40, started reading under the two bullet points to the end</li> </ul>
07:59-08:20	Google search results: <i>fiatcurrency cryptocurrency</i>	Opened Capital & Conflict page
08:20-08:54	<b>“Is Bitcoin a fiat currency?” (Capital &amp; Conflict)</b>	Scrolled through the page
08:54-09:23	Google search results: <i>fiatcurrency cryptocurrency</i>	<ul style="list-style-type: none"> <li>- Scrolled through the search results</li> <li>- 09:17, entered search term <i>cryptocurrency</i> [<i>sic</i>] and opened Wikipedia page</li> </ul>
09:23-13:28	<b>“Cryptocurrency” (Wikipedia)</b>	<ul style="list-style-type: none"> <li>- Read the topmost portion and took notes on paper hand-out</li> <li>- 12:53-13:06, toggled Naver English Dictionary window and entered search term <i>decentralized control</i></li> <li>- 13:22, started scrolling the page downward</li> </ul>

(continued)

Time	Web page	Actions <sup>a</sup>
13:28-13:48	Google	Entered search term <i>fiat currency</i> and opened Investopedia page
13:48-15:06	<b>“Fiat money” (Investopedia)</b>	Read the topmost portion and took notes on paper hand-out
15:06-15:58	Google	Entered search term <i>breteon woods fiat money</i> [sic] and read the search results
15:58-17:42	“Fiat money”	Read from the “Advantages and Disadvantages of Fiat Money” section and took notes on paper hand-out
17:42-20:28	“Cryptocurrency”	- Read the “Overview” section and took notes on paper hand-out - 19:13-19:33, toggled Naver English Dictionary window, entered search term <i>balance of ledger</i> , clicked <i>ledger</i> entry, and read the results

<sup>a</sup> Because Minseo had two web browser windows (i.e., content web page and online dictionary) open simultaneously throughout her L2 ORC session and also took notes on her paper hand-out instead of a word processor, it was especially difficult to exactly pinpoint where she was focusing on. For this reason, Minseo’s online dictionary use was not separated into distinct time intervals but presented together in this column.

Minseo started her L2 ORC session by opening Chrome, noting that Chrome was the most convenient browser for her when searching for information in English. After entering the search term *fiatcurrency cryptocurrency* [sic] into the address bar, she opened a web page titled “The Difference Between Fiat Currency and Cryptocurrency” on Cryptocurrency Facts. She reported that she chose the page because it contained the words *The Difference* in its title. Shortly afterwards, she opened Internet Explorer on the same screen and accessed Naver English Dictionary (<http://endic.naver.com/>). She also started taking notes on the paper hand-out while closely reading the page.

The purpose of Minseo’s online dictionary use while she read the first

page was twofold. First, she used the dictionary in order to find definitions of terms she did not understand (e.g., *legal tender*). More prominently, however, she used it to look for Korean equivalents of technical terminology that could refine her response to the comprehension task. She recalled:

Minseo: I searched [the dictionary] to see if *backed* was an economic term that I could find in the dictionary. But because it wasn't one, I wrote down [on the notes] that it [cryptocurrency] wasn't *authorized by* the central government or banks.

Minseo's reading of the first web page, complemented by online dictionary use, continued for about seven minutes before she returned to the search results. The next web page she accessed was "Is Bitcoin a fiat currency?" on Capital & Conflict (<https://www.capitalandconflict.com/>). She reported that she had selected the page because of the word *Bitcoin* in its title, based on which she predicted that she would be able to find information about examples of fiat currency and cryptocurrency. However, she closed the page after skimming it for about 30 seconds, noting that its information was not very relevant.

She then continued her L2 ORC session by searching for information on each of the key concepts (i.e., fiat currency and cryptocurrency). She first entered the search term *cryptocurrency* [*sic*] into Google and accessed a page titled "Cryptocurrency" on Wikipedia, which she noted as a credible source of information. She began to closely read the topmost portion and take notes on her paper hand-out. In the process, she also toggled the Naver English Dictionary window and entered the search term *decentralized control*, which to her

expectation, was a technical terminology in information technology.

Afterwards, she sought information on fiat currency by entering the search term *fiat currency* into Google. She reported that she had chosen an Investopedia page instead of the Wikipedia page she had in mind. She recalled:

Researcher: Did you know about this website [Investopedia]?

Minseo: Not really, but it seemed to be related to investment, so I thought it might have more economic information and decided to click the link.

She began reading the Investopedia page from the topmost portion while taking notes on her paper hand-out. She then initiated a new search on the Bretton Woods system, which is the monetary system that tied the value of money to gold until 1971, when the U.S. dollar became a fiat currency (Wikipedia, 2018, March 15). This complementary search seemed to be directed by her prior knowledge about the task topic. She recalled:

Minseo: So while I was reading this [Investopedia page], suddenly.. The gold standard, the Bretton Woods system came to my mind, so I conducted the search. So they converted money to gold – this is the Bretton Woods system. But after a conference, the gold standard system was abandoned. I don't remember exactly because I learned this a long time ago.

She did not go into much detail about the Bretton Woods system, however; she reported that she had learned that the Bretton Woods system was the dominant monetary system right before when fiat currency came to be used pervasively. She noted that she had read the text preview of a Wikipedia page about fiat money on the search results for this information.

For the remainder of her session, Minseo returned to each of the last two

web pages (i.e., Wikipedia and Investopedia pages) she accessed and took notes based on their content. What is noteworthy is the substantial amount of idea units she was able to verbalize after her L2 ORC session; she verbalized a total of 26 idea units based on information from only four content web pages (de facto three, excluding the Capital & Conflict page she closed shortly after skimming). Given her intermediate-level general English proficiency (i.e., a score of 680 on the TEPS) and minimal use of the Internet in English (i.e., less than 3 hours of weekly use), her background knowledge in economics seemed to have enabled her to extract more information from each web page.<sup>12</sup>

#### **4.2.4 Kyungmin: Highly Fluent Reading of Internet Text**

Kyungmin, a male student who is in his third semester of the master's program in English literature, reported he uses the Internet between seven to 14 hours in Korean and between 12 to 15 hours in English on a weekly basis. He mentioned that due to the influence of his major, he searches for information on the Internet primarily in English. He did report, however, that when there is too much information in English for him to read in limited time, he would look for the same information in Korean. He noted that Wikipedia pages are typically shorter in Korean and also that he reads much faster in Korean. Besides such

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<sup>12</sup> Although not mentioned in section 4.1, Minseo's response to the comprehension task also contained more economic examples and therefore was more detailed in nature; for example, she verbalized idea units such as "after the Bretton Woods system fell obsolete, fiat currencies emerged through the guarantee of state, government, or banks" and "there is a higher possibility of an economic bubble like that of the American financial crisis in 2007-2008."

information search related to his academic study, he uses the Internet mainly to read the news; he reported that he reads news articles mostly from Korean media platforms but also occasionally those from American platforms like The New Yorker (<https://www.newyorker.com/>). Moreover, he added that he usually watches American television shows on the Internet.

Kyungmin recalled that when he was given the directions for the L2 ORC task, the only plan he had in mind was to initiate the search with the search term *fiat currency vs. cryptocurrency*. In retrospect, he noted that the task was somewhat demanding for him due to his minimal prior knowledge in economics. He expressed how he was not able to think of definitions of key terminology that he saw on the web pages as quickly, compared to his typical Internet search during which he builds on some knowledge base he already has.

Nonetheless, Kyungmin's highly fluent English reading skills enabled him to process a substantial amount of information, accessing and reading eight content web pages that spanned over four pages of Google search results. The action timeline of Kyungmin's L2 ORC session is presented in Table 4.5.

Table 4.5

*Action Timeline of Kyungmin's L2 ORC Session*

Time	Web page	Actions
00:14-00:36	<b>Google</b>	Entered search term <i>fiat currency vs. cryptocurrency</i> and opened Cryptocurrency Facts page
00:36-02:00	<b>“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)</b>	- Read the two bullet points - 01:01, opened Word document - Copied the two bullet points
02:00-02:05	<b>Word document</b>	Pasted what was copied into Word document
02:05-02:42	“The Difference Between Fiat Currency and Cryptocurrency”	Read the two bullet points
02:42-03:05	Google search results: <i>fiat currency vs. cryptocurrency</i>	- 02:46, opened Bitcoin News page in new tab - 02:56, opened Digital Money Times page in new tab
03:05-04:08	<b>“Fiat Currency Vs Digital Currency” (Digital Money Times)</b>	Scrolled through the topmost portion and read from the “How Decentralized Currency Is Different” section
04:08-05:05	<b>“There’s a Big Difference Between Electronic Fiat and Cryptocurrency” (Bitcoin News)</b>	- Read the topmost portion - Copied a portion of the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section
05:05-05:09	Word document	Pasted what was copied into Word document
05:09-07:26	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	- Read the rest of the page - Copied section title “Censorship Resistance and Unstoppable Tax Protests”
07:26-07:32	Word document	Pasted what was copied into Word document
07:32-07:56	Google search results: <i>fiat currency vs. cryptocurrency</i>	- 07:41, opened page 2 of search results - 07:49, opened The Economist page in new tab
07:56-08:45	<b>“Bitcoin is fiat money, too – Not so novel” (The Economist)</b>	- Read the topmost portion - 08:29, used <i>Ctrl + F</i> to find <i>fiat</i> (1 result) and <i>crypto</i> (2 results)
08:45-09:03	Google search results: <i>fiat currency vs. cryptocurrency</i>	- 08:51, opened Wikipedia page in new tab - 09:01, opened page 3 of search results
09:03-09:47	<b>“Fiat money” (Wikipedia)</b>	- 09:05, used <i>Ctrl + F</i> to find <i>crypto</i> (1 result) - 09:08, opened “Cryptocurrency” Wikipedia page in new tab via hyperlink - 09:14, scrolled back up and started reading the topmost portion

(continued)

Time	Web page	Actions
09:47-09:58	Google	Entered search term <i>commodity money</i> 번역 [translation] and read the result
09:58-10:02	Google	Entered search term <i>네이버 사전</i> [Naver dictionary] and opened Naver Dictionary page
10:02-10:10	<b>Naver Dictionary</b>	Entered search term <i>commodity money</i>
10:10-10:15	“Fiat money”	Read the topmost portion
10:15-10:22	Naver Dictionary	Entered search term <i>representative money</i>
10:22-10:34	Word document	Modified notes based on dictionary results
10:34-10:40	<b>“Cryptocurrency” (Wikipedia)</b>	Read the topmost portion
10:40-10:53	“Fiat money”	Read the topmost portion
10:53-11:19	“Cryptocurrency”	Read the topmost portion
11:19-11:24	Naver Dictionary	Entered search term <i>ledger</i>
11:24-11:33	Cryptocurrency	- Read the topmost portion - Copied the last sentence of the first paragraph
11:33-11:54	Word document	Pasted what was copied and modified notes
11:54-12:16	Naver Dictionary	- Entered search term <i>tender</i> and clicked one of the entries - 12:12, entered search term <i>legal tender</i>
12:16-13:20	Word document	Modified notes based on dictionary results and information recalled from earlier web pages
13:20-13:33	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	13:28, used <i>Ctrl + F</i> to find <i>bail</i> (1 result)
13:33-13:38	Naver Dictionary	Entered search term <i>bailout</i> and clicked one of the entries
13:38-13:42	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	Read the portion near <i>bailout</i>
13:42-14:14	Word document	Modified notes based on Bitcoin News page
14:14-14:40	Google search results: <i>fiat currency vs. cryptocurrency</i>	14:22, opened American Thinker page in new tab
14:40-15:18	<b>“Cryptocurrency and Fiat Money” (American Thinker)</b>	Scrolled through the page
15:18-15:55	Google search results: <i>fiat currency vs. cryptocurrency</i>	- 15:25, opened page 4 of search results - 15:34, opened Blockchain.wtf page in new tab - 15:42, opened Bitcoin Magazine page in new tab - 15:45, opened The Bitcoin Report page in new tab - 15:55, opened Google Books search results

(continued)

Time	Web page	Actions
15:55-16:12	Google Books search results: <i>fiat currency vs. cryptocurrency</i>	16:09, opened <i>Cryptocurrency: Mining, investing, and trading in blockchain for beginners</i> book preview in new tab
16:12-18:07	<b>“Cryptocurrency: Mining, investing, and trading in blockchain for beginners” (Google Books)</b>	Read about 2 pages starting from the page presented on screen
18:07-18:33	<b>“Fiat money vs Cryptocurrency” (The Bitcoin Report)</b>	Read the image on the page and copied it
18:33-18:49	Word document	Tried to paste what was copied into Word document but failed due to an error
18:49-19:13	“Fiat money vs Cryptocurrency”	Read the image
19:13-19:57	Word document	Took notes based on the image
19:57-20:43	“Fiat money vs Cryptocurrency”	Read the image

Kyungmin started his L2 ORC session by opening Chrome, noting that Chrome is his web browser of choice whenever he uses the Internet. Regarding the search engine, he mentioned how he feels Google has the most comprehensive database, especially for information written in English. After entering the search term *fiat currency vs. cryptocurrency* into the address bar, he opened a web page titled “The Difference Between Fiat Currency and Cryptocurrency” on Cryptocurrency Facts. He reported that he chose the page because its title was the closest to what he was looking for. He began to closely read the two bullet points that contrasted fiat currency and cryptocurrency, noting that he had done so because it was his first encounter with the topic. In the process, he copied the two bullet points and pasted them into the Word document he had opened.

He then returned to the search results and opened two web pages in new tabs. The first page he opened was titled “There’s a Big Difference Between Electronic Fiat and Cryptocurrency” on Bitcoin News, the credibility of which he reported was questionable due to the word *Bitcoin* in its website name. He also noted that the media platform sounded like one that had recently been created. The second page he opened was “Fiat Currency Vs Digital Currency” on Digital Money Times. Although he had not heard of this website before, he recalled he had selected the web page because its title contained the word *vs*.

He first started reading the Digital Money Times page by skimming the topmost portion and reading from the section titled “How Decentralized Currency Is Different,” but did not take any notes based on its content. He then toggled the Bitcoin News page, which he started closely reading from the topmost portion. He first copied and pasted a portion of the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section, which he recalled was about how cryptocurrencies are less prone to inflation and are actually deflationary in nature. He continued reading to the end of the page and then copied the section title “Censorship Resistance and Unstoppable Tax Protests,” which he reported was very representative of the paragraphs explaining how cryptocurrencies cannot be tracked and thus can be used to evade taxation. He also mentioned that those two points were not present in the web pages he had previously read. After pasting the title into the Word document, he

returned to the search results.

The next page he opened was an article titled “Bitcoin is fiat money, too - Not so novel” on The Economist (<https://www.economist.com/>). While he was reading from the topmost portion, he pressed *Ctrl + F* to locate the words *fiat* and *crypto*. He recalled:

Kyungmin: This [The Economist page] seemed like something new. I thought it would say something along the lines of how cryptocurrencies are actually not very different from fiat currencies—but it wasn’t really what I was looking for. It sounded like something a supporter of fiat currencies would say. So I tried to find what it was saying [about the two key concepts], but there wasn’t much.

Afterwards, he returned to the search results and opened the “Fiat money” Wikipedia page, shortly after which he pressed *Ctrl + F* to locate the hyperlink to the “Cryptocurrency” Wikipedia page that he opened in a new tab. He mentioned that he wanted to read the two pages together in order to compare the two concepts. Furthermore, he noted that he focused primarily on the top portion of each Wikipedia page because he would not be needing too much detailed information. While he read the two Wikipedia pages, he opened Naver Dictionary (<http://dic.naver.com/>) and searched for definitions of economic terminology such as *commodity money*, *representative money*, *ledger*, and *legal tender*. This continued for about three minutes before he began to organize and review his notes on the Word document.

He then returned to the third content web page he had accessed (i.e., “There’s a Big Difference Between Electronic Fiat and Cryptocurrency”) and

looked for the word *bail* using *Ctrl + F*. He found one result, which was part of the word *bailout*; he recalled that he had forgotten to look this up in the dictionary earlier. He then entered the search term *bailout* into Naver Dictionary and clicked one of the entries for its definition. Subsequently, he quickly returned to the page and read the portion near the word *bailout* and modified his notes based on its content. At this point, which was about 14 minutes into his L2 ORC session, Kyungmin noted that he thought he had found nearly everything he needed to find.

For the remainder of his session, nonetheless, Kyungmin continued to look for web pages that were relevant to the task. From page 3 of his initial search results, he opened a page titled “Cryptocurrency and Fiat Money” on American Thinker (<https://www.americanthinker.com/>). However, he exited the page after skimming it for about 40 seconds, noting that he did not like the page because its format made it hard to read. After opening three more web pages in new tabs from page 4 of the search results, he accessed the Google Books search results. He noted that he had done so because books usually contain more accurate information. He also mentioned how he had looked for books that were more recently published. This led him to open the online preview of the book titled *Cryptocurrency: Mining, investing, and trading in blockchain for beginners*. He read about two pages starting from the page initially presented on screen until he came across information about the origin of cryptocurrency,

which he reported he did not need.

Finally, the last web page Kyungmin read was “Fiat money vs Cryptocurrency” on The Bitcoin Report (<http://www.thebitcoinreport.nl/>). This page did not contain much text, however; the page instead contained a long graphic illustration that contrasted fiat money and cryptocurrency. He thought this illustration would be useful for the comprehension task and tried to copy and paste it into the Word document, but failed to do so due to a software error. He then took notes based on this illustration, writing down portions of the text on it. More specifically, he recalled he had learned for the first time that the value of cryptocurrencies was determined by supply and demand. In contrast, he mentioned that he had repeatedly read from other pages that the value of fiat currencies could be influenced by government control.

#### **4.2.5 Youngmi: Synthesis from General to Specific Information**

Youngmi, a female student who is in her senior year in French language education and international relations, reported she uses the Internet between 14 to 21 hours in Korean and more than 15 hours in English on a weekly basis. She mentioned that she searches for information about topics that are closely related to Korea like news about Korean celebrities in Korean. In contrast, she searches for concepts that she would like to learn about in English, noting that she often accesses websites like Quora and Wikipedia. She also mentioned based on her experience that online encyclopedia entries written in Korean sometimes contain

inaccurate information. When she is not searching for information, Youngmi frequently watches American television shows on the Internet. Furthermore, she reported that she reads posts on her university's online community as well as some news articles in Korean.

Youngmi recalled that when she was given the directions for the L2 ORC task, she thought she would first look for the general definitions of the two key concepts before conducting a more specific search on their difference. Such synthesis from general to specific information was most notably observed from Youngmi. In retrospect, she mentioned that she had felt a bit rushed during the task because she did not know how long it would take her to read and organize the information she had found. The action timeline of Youngmi's L2 ORC session is presented in Table 4.6.

Table 4.6

*Action Timeline of Youngmi's L2 ORC Session*

Time	Web page	Actions
00:07-00:47	<b>Word document</b>	Opened Word document and created sections for fiat currency and cryptocurrency
00:47-01:01	<b>Google</b>	Entered search term <i>fiat currency</i> and opened Wikipedia page
01:01-01:08	<b>“Fiat money” (Wikipedia)</b>	Read the topmost portion
01:08-01:22	Google	Entered search term <i>cryptocurrency</i> and opened “Cryptocurrency” Wikipedia page
01:22-02:12	“Fiat money”	- Read the topmost portion - 02:07, opened “Representative money” Wikipedia page in new tab via hyperlink
02:12-02:31	<b>“Representative money” (Wikipedia)</b>	Read the topmost portion
02:31-02:33	“Fiat money”	Read near <i>representative money</i>
02:33-02:58	Word document	Took notes based on “Fiat money” Wikipedia page
02:58-03:02	“Fiat money”	Read the topmost portion
03:02-03:33	<b>“Cryptocurrency” (Wikipedia)</b>	Read the topmost portion
03:33-03:43	Word document	Took notes based on “Cryptocurrency” Wikipedia page
03:43-03:52	“Cryptocurrency”	Read the last sentence of the introductory paragraph
03:52-04:12	“Fiat money”	- Read the “Contents” section - 04:00, clicked “3. Precious metals” hyperlink, read the section, and scrolled through the following sections
04:12-04:22	“Cryptocurrency”	Read the “Contents” section
04:22-04:49	Word document	Took notes based on “Fiat money” and “Cryptocurrency” pages
04:49-05:30	Google	- Entered search term <i>differences between fiat currency and cryptocurrency</i> - 05:16, opened Quora page in new tab - 05:24, opened Bitcoin News page in new tab
05:30-06:28	<b>“What’s the difference between fiat and cryptocurrencies?” (Quora)</b>	Read from the topmost portion to before point 2 of the first answer
06:28-06:36	Word document	Took notes based on Quora page

(continued)

Time	Web page	Actions
06:36-07:08	“What’s the difference between fiat and cryptocurrencies?”	Read point 2 of the first answer
07:08-07:37	Word document	Took notes based on Quora page
07:37-08:16	“What’s the difference between fiat and cryptocurrencies?”	Finished reading the first answer
08:16-08:32	Word document	Took notes based on Quora page
08:32-09:34	<b>“There’s a Big Difference Between Electronic Fiat and Cryptocurrency” (Bitcoin News)</b>	Read the topmost portion, scrolled through the following paragraphs, and read the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section
09:34-09:57	Word document	Took notes based on Bitcoin News page
09:57-10:12	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	Read the second paragraph of the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section
10:12-10:58	Word document	Took notes based on Bitcoin News page
10:58-11:18	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	Read the first and second paragraphs of the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section
11:18-11:25	Word document	Took notes based on Bitcoin News page
11:25-11:49	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	Read the second, third, and fourth paragraphs of the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section
11:49-12:17	Word document	Took notes based on Bitcoin News page
12:17-12:20	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	Quickly referred back to the fourth paragraph of the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section
12:20-12:28	Word document	Took notes based on Bitcoin News page
12:28-13:10	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	Read the “Censorship Resistance and Unstoppable Tax Protests” section and scrolled through the rest of the page
13:10-13:33	Word document	Took notes based on Bitcoin News page
13:33-13:42	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	Referred back to the “Censorship Resistance and Unstoppable Tax Protests” section
13:42-13:47	Word document	Took notes based on Bitcoin News page
13:47-13:50	“There’s a Big Difference Between Electronic Fiat and Cryptocurrency”	Referred back to the “Censorship Resistance and Unstoppable Tax Protests” section
13:50-14:08	Word document	Took notes based on Bitcoin News page

(continued)

Time	Web page	Actions
14:08-14:11	Google search results: <i>differences between fiat currency and cryptocurrency</i>	Opened Cryptocurrency Facts page in new tab
14:11-14:42	<b>“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)</b>	Read up to the two bullet points
14:42-14:52	<b>Naver English Dictionary</b>	Opened new tab, entered URL <i>endic.naver.com</i> , and entered search term <i>legal tender</i>
14:52-15:16	Word document	- Took notes based on Cryptocurrency Facts page - 15:02, quickly referred back to Naver English Dictionary
15:16-15:30	“The Difference Between Fiat Currency and Cryptocurrency”	Read the paragraph after the two bullet points
15:30-16:30	Word document	Took notes based on Cryptocurrency Facts page
16:30-16:52	“The Difference Between Fiat Currency and Cryptocurrency”	Read two paragraphs after the two bullet points
16:52-17:31	Word document	Took notes based on Cryptocurrency Facts page
17:31-17:38	“The Difference Between Fiat Currency and Cryptocurrency”	Read two paragraphs after the two bullet points
17:38-17:54	Word document	Took notes based on Cryptocurrency Facts page
17:54-18:10	Naver English Dictionary	Entered search term <i>intrinsic</i> and clicked first entry
18:10-19:00	Word document	Rearranged the content of the notes
19:00-19:17	Google search results: <i>differences between fiat currency and cryptocurrency</i>	Opened Digital Money Times page in new tab
19:17-20:13	<b>“Fiat Currency Vs Digital Currency” (Digital Money Times)</b>	Read from the second paragraph of the “The Downfall of Centralized Currency” section
20:13-20:24	Naver English Dictionary	Entered search term <i>tamper</i>
20:24-20:42	“Fiat Currency Vs Digital Currency”	Read the last two paragraphs of the page
20:42-20:49	Word document	Took notes based on Digital Money Times page

Youngmi started her L2 ORC session by opening a Word document and typing in the headings *fiat currency* and *cryptocurrency* to create separate sections for each key concept. She then opened Chrome and accessed Google, noting that she usually uses Google to find information in English. She began her

search with the term *fiat currency* and opened the “Fiat money” page on Wikipedia. Shortly afterwards, she entered the search term *cryptocurrency* into Google and opened another Wikipedia page titled “Cryptocurrency.” She recalled:

Youngmi: I opened this [the “Cryptocurrency” page] before finishing reading [the “Fiat money” page] because I wanted to refer to the other page in case I don’t understand the difference by reading only one page.  
Researcher: To read them simultaneously?  
Youngmi: Yes, because that might help.

She then closely read the two Wikipedia pages, primarily focusing on the definitions of the two concepts and taking notes based on them. While she read the introductory section of the “Fiat money” Wikipedia page, she quickly accessed the “Representative money” Wikipedia page for the definition of *representative money* by clicking its hyperlink. After finishing reading the introductory sections of the two pages, she focused on the “Contents” section that contained hyperlinks to all the sections on the page. On the “Fiat money” page, she clicked on a hyperlink to the section “3. Precious metals.” She recalled:

Youngmi: I clicked number 3 because I was curious about why that was there. On the top [of the page] it said it [fiat money] had no intrinsic value, but precious metals was there [in the “Contents” section]. So I thought, why is that there? But the section itself wasn’t very noteworthy.

After reading the Wikipedia pages for about four minutes, she returned to Google to initiate a new search. She recalled:

Youngmi: I didn’t stay on Wikipedia for that long because there was too

much to read and also a lot of unnecessary information. I thought it would be better to directly search [for the difference] and then return [to the Wikipedia pages] if I can't find anything.

She entered the search term *differences between fiat currency and cryptocurrency* and opened a web page titled “What’s the difference between fiat and cryptocurrencies?” on Quora. She was familiar with the website Quora, noting that she wanted to read the page because users usually post informal, “easy-to-read” answers on it. She finished reading the first answer on the screen, toggling the Word document to take notes as necessary.

The next web page Youngmi accessed was “There’s a Big Difference Between Electronic Fiat and Cryptocurrency” on Bitcoin News. She reported that she chose the page because she thought a website specializing in Bitcoin would have compared the two types of currencies in a clear manner. She skimmed the introductory section—which she mentioned was not very relevant—and started closely reading from the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section. She read the page for about five and a half minutes, frequently toggling the Word document in order to take notes.

She then returned to the search results and opened a page titled “The Difference Between Fiat Currency and Cryptocurrency” on Cryptocurrency Facts. While she read the page, she accessed Naver English Dictionary by typing in the URL *endic.naver.com* and entered the search term *legal tender*. She then

continued reading the page, from which she reported she had learned more about the commonalities between the two concepts. Again, she frequently toggled the Word document to take notes. Before she moved on to the next web page, she also looked up *intrinsic* in Naver English Dictionary. She mentioned that although she knew its definition, she had done so in order to find its most accurate Korean equivalent that she can use in the comprehension task.

The last web page Youngmi accessed was “Fiat Currency Vs Digital Currency” on Digital Money Times. She reported that she decided to simply skim the page for two reasons. First, she was aware that she only had about a minute left to complete the L2 ORC session. Furthermore, she felt that the web page was biased favorably towards cryptocurrencies in that it described them as “tamper-proof” and having “no single point of failure.” After skimming through the page, she quickly modified her notes until the allotted time ran out.

#### **4.2.6 Taeyeon: Critical Evaluation of Internet Text**

Taeyeon, a female student who is in her senior year in linguistics and social welfare, reported she uses the Internet between seven to 14 hours in Korean and less than 3 hours in English on a weekly basis. She mentioned that while she searches for most information related to her everyday life such as news articles in Korean, she also often conducts searches in English to find information for her academic study. She added that while she could find information about most linguistic phenomena in English, she has to search in

Korean for academic articles in Korean linguistics. For other science-related fields, she mentioned that she would first try to search in English but repeat the same search in Korean if she could not understand the information she had found. Besides these search-related purposes, Taeyeon usually watches American talk shows on YouTube, noting that she sometimes searches for background information on political events that are referred to on the shows. She also spends her time reading posts on her university's online community and Reddit ([www.reddit.com](http://www.reddit.com)) for entertainment.

Taeyeon recalled that when she was given the directions for the L2 ORC task, she thought she would enter both key words and either *difference* or *versus* together as the search term, because separate searches for each concept would not lead to information about their difference. After completing the task, she reported that she had felt a bit rushed during the L2 ORC session due to the time limit. Furthermore, she regretted not having accessed reliable media platforms (as she recalled for example, The New York Times or The Washington Post) and conducting key word searches there. Finally, she noted that she read each web page more carefully compared to her typical web searches, during which she is usually quick to reject web pages that are not significant.

Taeyeon's L2 ORC session was noteworthy in how she did not accept the information she had found at face value but examined the potential bias underlying it. Such critical evaluation of Internet text not only influenced her

selection of web pages to read, but also led her to initiate a complementary search during her session. The action timeline of Taeyeon’s L2 ORC session is presented in Table 4.7.

Table 4.7

*Action Timeline of Taeyeon’s L2 ORC Session*

Time	Web page	Actions
00:31-00:55	<b>Google</b>	Entered search term <i>cryptocurrency vs fiat currency</i> and opened Cryptocurrency Facts page
00:55-01:13	<b>“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)</b>	Read from the topmost portion and copied <i>legal tender</i>
01:13-01:23	Google	Entered search term <i>google translate</i> and pasted what was copied into the Google Translate text box
01:23-02:21	“The Difference Between Fiat Currency and Cryptocurrency”	Started taking notes on paper hand-out and read to the end of the page
02:21-02:30	Google search results: <i>cryptocurrency vs fiat currency</i>	Opened Digital Money Times page
02:30-06:27	<b>“Fiat Currency Vs Digital Currency” (Digital Money Times)</b>	Started reading from the “The Downfall of Centralized Currency” section and took notes on paper hand-out
06:27-06:33	Google search results: <i>cryptocurrency vs fiat currency</i>	Opened HuffPost page
06:33-07:40	<b>“Are Cryptocurrencies Just More Fiat Money?” (HuffPost)</b>	Scrolled through the page
07:40-08:28	Google search results: <i>cryptocurrency vs fiat currency</i>	- 07:46, opened Google News results - 07:57, modified search term to <i>cryptocurrency fiat currency difference</i> and opened RT Business News page
08:28-08:37	<b>“No chance of cryptocurrencies replacing fiat money – JPMorgan” (RT Business News)</b>	Scrolled through the page

(continued)

Time	Web page	Actions
08:37-09:08	Google News search results: <i>cryptocurrency fiat currency difference</i>	- 08:41, opened page 2 of search results - 08:58, opened page 3 of search results - 09:02, returned to All results and opened Bitcoin News page
09:08-11:29	<b>“There’s a Big Difference Between Electronic Fiat and Cryptocurrency” (Bitcoin News)</b>	Scrolled down to the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section, read it, and took notes on paper hand-out
11:29-11:37	Google search results: <i>cryptocurrency fiat currency difference</i>	Opened Core Sector Communique page
11:37-11:43	<b>“The Difference Between Cryptocurrencies, Digital Currencies and Fiat Currencies” (Core Sector Communique)</b>	Scrolled through the page
11:43-12:00	Google search results: <i>cryptocurrency fiat currency difference</i>	- 11:48, opened page 2 of search results - Opened CEX.IO Blog page
12:00-13:11	<b>“Comparing Currencies: Fiat, Crypto, and Virtual” (CEX.IO Blog)</b>	Read from the “Fiat Currency” section
13:11-13:40	Google	Entered search term <i>fiat currency better than cryptocurrency</i> and opened Forbes page
13:40-16:19	<b>“All the Reasons Cryptocurrencies Will Never Replace Gold As Your Financial Hedge” (Forbes)</b>	Scrolled through the page, read the “#4: Lack of Security Undermines Cryptocurrencies’ Effectiveness” section, and took notes on paper hand-out
16:19-17:36	Google search results: <i>fiat currency better than cryptocurrency</i>	- 16:24, opened page 2 of search results - 16:38, opened Google News search results - 16:52, opened page 2 of search results - 17:09, opened page 3 of search results - 17:21, opened The Japan Times page in new tab - 17:26, returned to All results - 17:29, opened Bitconnect page but exited right away
17:36-19:09	<b>“Cryptocurrency boom: A fading fad or real innovation?” (The Japan Times)</b>	Skimmed the page and took notes on paper hand-out
19:09-19:25	Google search results: <i>fiat currency better than cryptocurrency</i>	- 19:14, opened page 2 of search results - Opened Forbes page

(continued)

Time	Web page	Actions
19:25-19:41	<b>“Tim Draper on Bitcoin: ‘In 5 Years If You Use Fiat Currency, They Will Laugh At You’” (Forbes)</b>	Scrolled through the page
19:41-19:50	Google search results: <i>fiat currency better than cryptocurrency</i>	Opened Investopedia page
19:50-21:10	<b>Could Cryptocurrencies Replace Cash? (Investopedia)</b>	- Read from the “Possible Advantages to a Crypto Future” section - 21:08, clicked hyperlink “with ample speculation abounding that the cryptocurrency industry is a bubble that is destined to pop”

Taeyeon started her L2 ORC session by opening Chrome, noting that she usually uses Chrome because the Google search function built into its address bar is convenient. After entering the search term *cryptocurrency vs fiat currency* into the address bar, she opened a web page titled “The Difference Between Fiat Currency and Cryptocurrency” on Cryptocurrency Facts, which was the topmost search result. She reported that she usually accesses web pages starting from the topmost search result, unless they are from less trustworthy sources like Quora or Reddit. She also mentioned that she decides to either stay on a page or exit it based on its quality of information. As she began reading the Cryptocurrency Facts page, she copied the term *legal tender* and pasted it into the Google Translate text box she had opened by entering the search term *google translate* into Google. She then started to take notes on her paper hand-out as she finished reading the page.

The next page she opened was “Fiat Currency Vs Digital Currency” on Digital Money Times. She reported that although she usually tries to select news

articles from authoritative media platforms, she was not familiar enough with American media platforms to do so during the L2 ORC session. She began reading from the “The Downfall of Centralized Currency” section located below the introductory paragraphs, noting that she usually skips about one to two paragraphs as they do not contain much essential information. As she recalled her thought process while reading the page, she expressed the bias she had noticed during her L2 ORC session. She explained:

Taeyeon: I felt while I was reading that there were a lot of pages that advocated cryptocurrencies. So while this page [“Fiat Currency Vs Digital Currency”] was okay, I was a bit dissatisfied during the search because there were few articles that explained how fiat currency was better. Instead, there were many articles that boasted the advantages of cryptocurrency by contrasting it to fiat currency.

She then returned to the search results and opened an article titled “Are Cryptocurrencies Just More Fiat Money?” on HuffPost. She recalled she had wanted information about the advantages of fiat currencies and accessed the article thinking it might contain relevant information. However, she returned to the search results after skimming the page for about one minute; she noted that the article contained too much personal opinion.

Shortly after returning to the search results, Taeyeon opened the Google News search results and scrolled through its first page. Subsequently, she modified the search term to *cryptocurrency fiat currency difference* and opened a page titled “No chance of cryptocurrencies replacing fiat money – JPMorgan” on RT Business News (<https://www.rt.com/business/>). However, she quickly closed

the page noting that it was simply an article about a quote from JPMorgan and was not very detailed in its content. She then skimmed up to page 3 of the Google News search results but reported she was not able to find articles from trustworthy media platforms she had heard of before. Accordingly, she returned to Google “All” search results and opened a page titled “There’s a Big Difference Between Electronic Fiat and Cryptocurrency” on Bitcoin News. She started reading from the “The Glaring Differences Between Electronic Fiat and Cryptocurrencies” section, noting she was able to obtain more information about cryptocurrencies.

The next web page she accessed was “The Difference Between Cryptocurrencies, Digital Currencies and Fiat Currencies” on Core Sector Communique (<http://corecommunique.com/>), which she quickly rejected because of its seemingly untrustworthy format. She then returned to page 2 of the search results and opened a page titled “Comparing Currencies: Fiat, Crypto, and Virtual” on CEX.IO Blog (<https://blog.cex.io/>). She began to read closely from the “Fiat Currency” section, noting that she had been looking for more detailed information on fiat currencies.

After reading the page for about a minute, she returned to Google and initiated a new search with the term *fiat currency better than cryptocurrency*. She reported that this was to counterbalance the bias she had seen in the web pages earlier. She accessed a page titled “All the Reasons Cryptocurrencies Will

Never Replace Gold As Your Financial Hedge” on Forbes (<https://www.forbes.com/>). She especially focused on the “#4: Lack of Security Undermines Cryptocurrencies’ Effectiveness” section, reporting that she had learned about the potential dangers of cryptocurrencies. After finishing the section, she scrolled to the bottom of the page to check if there were any related articles that were noteworthy. However, she closed the page noting that they were all about which cryptocurrencies to invest in and therefore irrelevant to the task.

Returning to the search results, she accessed an article titled “Cryptocurrency boom: A fading fad or real innovation?” on The Japan Times (<https://www.japantimes.co.jp/>) through the Google News search results. She recalled:

Taeyeon: Yes, I accessed this article because of its title, and.. Although I haven’t heard of The Japan Times before, it seemed like a reliable media platform because of the word *Times* in its title.

She skimmed the contents of the article, also taking notes on the paper hand-out as necessary. She reported that she was able to learn more about the potential problems with cryptocurrencies from a Japanese perspective. She noted that this was new, as most articles she had previously read were written from an American perspective.

The next web page she opened was an article titled “Tim Draper on Bitcoin: ‘In 5 Years If You Use Fiat Currency, They Will Laugh At You’” on Forbes. However, she exited the article after quickly skimming its contents. She

had made an erroneous prediction, as is evident in her recall:

Taeyeon: Only up to this portion of the title [“In 5 Years If You Use Fiat Currency, They Will ...”] was visible on the search results. So I thought it would be an article advocating fiat currencies at first, but it was something like “they will laugh at you,” so it was actually in support of cryptocurrencies.

The last web page Taeyeon opened during her L2 ORC session was a page titled “Could Cryptocurrencies Replace Cash?” on Investopedia. Again, she had made a wrong prediction based on the title of the page. She recalled:

Taeyeon: I was expecting a flow like “Given that cryptocurrencies have problems, could they replace cash? No.” But it [the page] wasn’t something like that.

She kept on reading the page until the allotted time ran out, focusing on the section “Possible Advantages to a Crypto Future.” Right before the time ran out, she clicked a hyperlink embedded on the text “with ample speculation abounding that the cryptocurrency industry is a bubble that is destined to pop,” which she noted seemed interesting.

### **4.3 Strategy Use Behind L2 ORC**

The analysis of the six participants’ L2 ORC sessions according to Cho and Afflerbach’s (2017) categorization of constructively responsive reading strategies for reading on the Internet revealed that a wide variety of strategy use contributed to their successful L2 ORC. Just as they conceptualized the strategies required for reading that takes place on the Internet, all six participants of the current study utilized strategies for constructing a coherent reading path as well

as comprehending single and multiple digital texts in order to meet the task demands. The strategies that were identified are presented in this section alongside representative examples.

#### **4.3.1 Strategies for the Construction of Reading Paths**

**Accessing and overviewing a goal-relevant information space by searching for relevant websites or information retrieval systems.** In order to begin their L2 ORC sessions, all six participants first chose Google as their primary search engine. As evidenced by the stimulated recall data, most participants mentioned they had selected Google because of its comprehensive database, especially for information written in English. Such underlying knowledge that different search engines lead to different sets of information became more evident through how most participants accessed the search engine Naver to search for Korean definitions of unknown terminology they had encountered. Moreover, Kyungmin and Taeyeon also utilized Google Books and Google News searches respectively during their L2 ORC sessions in order to further narrow down their search according to the type of information.

**Reducing and managing the range of possible information to be encountered by generating and modifying search terms related to topic and focus of a task.** All six participants also generated a search term that led to information on the difference between fiat currency and cryptocurrency. With the exception of Minseo, who entered only *fiatcurrency cryptocurrency [sic]* as

the first search term, the participants also included words denoting contrast (e.g., *difference* or *vs.*) in their search terms. While most participants accessed web pages only from their initial search results—which indicates their successful search—Taeyeon slightly modified her search term (i.e., from *cryptocurrency vs fiat currency* to *cryptocurrency fiat currency difference*) in an attempt to locate news articles on the difference between the two key concepts.

**Scrutinizing hyperlinks to anticipate and judge the usefulness and significance of information before accessing it, based on specific reading goals.** The use of this strategy was most prominently observed from the participants, who had to choose web pages to read from their search results. They made judgements based on both the title and the source of web pages. First, the relevance of the web page title to the task demands was identified as an important criterion in the selection of a web page; the participants mentioned they had opened a web page because its title seemed to fit the task demands or explicitly contained the terms *difference* or *vs.* The participants were also mindful of the credibility of the source of information, selecting web pages from websites they were familiar with or those that “seemed trustworthy.” The date of publication also served as a criterion for judging the value of information, as Kyungmin recalled about his preference for recently published material in Google Books.

However, such prediction of the quality of information on each web page

was not always accurate; the participants also came across largely irrelevant or even unexpected information. Such instances were observed in Taeyeon's L2 ORC session, during which she had made predictions about the content and logical flow of some web pages but discovered that they were in fact inaccurate after having read them.

**Assessing relevance and usefulness of information in relation to the tentative meaning constructed through the initial and ongoing exploration.**

Once the participants opened a web page, they evaluated its relevance and usefulness to the task demands and decided to either continue reading it or exit out of it. Often times, this evaluation took place in light of previously read texts as well; the participants actively sought new information that they had not encountered in previous web pages. If a web page was redundant and did not make unique contributions to the task, the participants were quick to reject it. This was evident in how Seunghoon and Kyungmin quickly exited web pages they came across after having reached the conclusion that they had located most of the information they needed to find.

An interesting instance in which a web page initially deemed as less useful was later re-accessed was observed from Jiwoo's L2 ORC session. When she first encountered a Quora page that contained user-generated answers, she rejected it in want of more trustworthy information. However, after accessing another web page with text that was difficult for her to understand, she returned

to the Quora page with the expectation that user-generated answers would be written in easier language. This exemplifies that the usefulness of a web page is not static but can change in relation to that of other web pages.

**Evaluating nature, tone, or feel of a website and deciding to use or not use it.** After accessing a web page, the participants occasionally decided to reject it based on the overall structure and feel of the web page. For example, Seunghoon noted how the Steemit page he had accessed only contained short user-generated posts that were unlikely to be detailed explanations of fiat currency and cryptocurrency. In addition, Kyungmin mentioned his dislike for the American Thinker page, which had a format that made it difficult to read. Such negative evaluation of the web pages led to their quick rejection, both within one minute.

**Accessing complementary sources to get background information or to survey references.** The participants' reading paths were in part directed by their need for background information on the task topic. This was most evident in Youngmi's L2 ORC session, which she started by accessing Wikipedia pages for a broad understanding of each of the two concepts before searching for their specific difference. Minseo's complementary search on the Bretton Woods system, albeit less expected, was of similar nature; she conducted a search on the monetary system in effect prior to the widespread use of fiat currencies for a deeper understanding of fiat currencies.

### **Backlinking and revisiting pages to revise constructed meaning.**

Some participants returned to web pages they had finished reading during their L2 ORC sessions to additionally process the text on them. Two noteworthy instances of this strategy use were observed. Jiwoo returned to read the Quora page she was quick to reject due to the unwarranted credibility of its information; she recalled that she was in need of relevant information written in “easier” English. Kyungmin, although with less clear intentions, also returned to a page he had finished reading in order to re-read a portion of it. Such backlinking positively contributed to these participants’ L2 ORC, as was evident in the note-taking that took place right after their second visits to the same web pages.

**Using navigation functions to select, structure, and create environments to assist in constructing text meaning.** The participants also constructed a reading path within a web page by utilizing navigation functions built into the web browser or the web page. For instance, Kyungmin used the *Find (Ctrl + F)* function on Chrome to quickly locate the key concepts on a web page he had accessed. Youngmi also navigated to a different portion of a Wikipedia page by clicking a hyperlink that shifts the screen to a different section of the page. These navigation functions assisted the participants’ selective reading on a single web page.

### **4.3.2 Strategies for Comprehending a Single Digital Text**

**Looking for important information written or visualized in text and paying greater attention to it than other information.** As with most typical web pages today, the text on the pages accessed by the participants varied in format (e.g., font, size, and style). This made it possible for the participants to identify the key information on each page and read it more carefully. For example, the web page “The Difference Between Fiat Currency and Cryptocurrency” on Cryptocurrency Facts contained two indented bullet points that directly compared fiat currency and cryptocurrency. All six participants that accessed this web page read this portion carefully in order to meet the task demands. A similar phenomenon was also observed from some news articles the participants read; because these articles had subheadings that stood out from the main text, the participants were able to quickly identify the sections they needed to allocate their attention to.

**Adjusting reading speed and concentration depending on the perceived importance of text to reading goals.** Due to the immense amount of information on the Internet in stark contrast to the limited time given to complete the task in this study, all six participants had to judiciously adjust their reading speed and level of concentration to gather the required information. This strategy use was observed from nearly every web page the participants had accessed; they quickly skimmed the web page first in order to identify relevant or unique

information and then slowed down their reading speed to process it more carefully. In many cases, the participants also skipped portions of web pages they considered to be unnecessary for the task. For example, both Seunghoon and Taeyeon did not read introductory paragraphs of news articles they had accessed, noting that they usually do not contain much noteworthy information.

An interesting case of such selective reading was observed from Seunghoon's L2 ORC session; he skipped a paragraph of an article because he was not able to understand its content. This indicates that for the less established reader—for example, learners of English—the perceived comprehensibility of the text is also likely to influence the decision on whether to continue reading or skip the text.

**Evaluating author's purposes, intentions, and goals based upon the analysis of the assumptions, worldviews, and beliefs that are often hidden in text.** This strategy of “reading between the lines” was not widely observed from the participants' L2 ORC sessions, most likely because the topic of fiat currency and cryptocurrency was not a very controversial one. Nonetheless, Youngmi and Taeyeon were able to identify the bias underlying news articles on cryptocurrencies; both participants noted how some articles implicitly supported the use of cryptocurrencies over fiat currencies. Such bias noted by the two participants influenced their subsequent actions; Youngmi decided to simply skim the biased article without paying much attention to it, and Taeyeon initiated

a complementary search for web pages in support of the opposite side (i.e., in favor of fiat currencies).

**Changing reading strategies when comprehension is perceived not to be proceeding smoothly.** While the majority of the participants did not demonstrate noteworthy shifts in their strategy use during their L2 ORC sessions, Jiwoo started to rely heavily on an online translator after about 10 minutes into her session, translating paragraphs of English text into Korean. She recalled that she had done so because she felt pressured by the scarcity of relevant information she had found up until that time point. Although this change in strategy use was mostly induced by the timed nature of the reading task in the current study, it is also conceivable that learners of English would use an online translator to translate the foreign language text into their native language in order to assist quicker comprehension of the text.

**Using online resources to assist comprehension of text.** Likewise, the majority of the participants referred to online resources such as dictionaries and translators to search for definitions of terms and phrases they did not understand. The most prominently observed instances were searches for explanations of technical terminology such as *legal tender*, *bank credit*, and *balance of ledger*. This seemed to be widely observed largely because the participants' level of prior knowledge about the task topic was minimal. Furthermore, the participants also referred to online dictionaries and translators to find Korean definitions of

English phrases like *backed by government*, *sans the bank*, and *tamper*. This was also expected from the participants, as not all of them had nativelike control of the English language.

### **4.3.3 Strategies for Comprehending Multiple Digital Texts**

**Reading sections of different texts recursively, as required to solve problems across multiple texts.** Some participants had multiple web pages simultaneously open in separate web browser tabs and toggled between them in order to read them recursively. Such behavior was observed from Kyungmin and Youngmi, who both simultaneously read the “Fiat money” and “Cryptocurrency” Wikipedia pages. They both also focused on comparing the introductory sections of the two web pages, reporting that they had done so in accordance with the task directions to find and report the difference between the two concepts.

**Rereading and linking text segments that were previously regarded as unrelated to finalize crosstextual meaning structures.** As the task directed the participants to find the difference between fiat currency and cryptocurrency, all six participants found various criteria that could be used to contrast the two concepts. For example, when Jiwoo first read how cryptocurrencies exist solely in digital form, she identified the form of currency as a potential criterion for contrasting the two types of currencies. This consequently made her realize the gap in the information about the form of fiat currencies and led her to return to a web page she had finished reading. Through her second visit to the page, she was

able to “fill in the gap,” learning that fiat currencies also exist in physical forms like bills and coins.

**Activating knowledge acquired in previous readings to augment comprehension of the current text.** This strategy use was not explicitly observed from most participants, although it can be expected that readers with minimal prior knowledge about the task topic would have applied what they had learned from previous web pages when they read new web pages. Youngmi, exceptionally, started her L2 ORC session with this strategy in mind; she first accessed Wikipedia pages on the two concepts for a general understanding before delving specifically into the difference between them.

**Making meanings from different multimodal texts and determining contribution of each modal information to a coherent understanding of the texts.** Although the majority of the web pages the participants accessed contained primarily written text, the participants also obtained relevant information from videos and illustrations embedded into web pages. For example, Seunghoon watched a YouTube video that contrasted the two types of currencies. What is noteworthy is how he “skimmed the video” by skipping over portions and also pausing it to closely read the text that was presented on screen. This exemplifies how the adjustment of reading speed and concentration that is typical of text reading can apply to videos as well. Similarly, Kyungmin located an illustration that compared fiat currency and cryptocurrency towards the end of

his L2 ORC session. He recalled that while most of its content was redundant, he was able to learn that the value of cryptocurrencies was primarily determined by supply and demand.

**Perceiving that multiple texts related to the same topic can provide diverse and contrasting views about the topic.** Again, because the task topic was not very controversial in nature, most participants did not evaluate the viewpoints underlying the web pages they had accessed. However, Taeyeon recognized how some news articles were written favorably towards cryptocurrencies and conducted a complementary search with the search term *fiat currency better than cryptocurrency* for additional information from a contrary perspective.

**Organizing related information across texts by using related strategies.** This strategy use was largely motivated by the task directions that encouraged note-taking. All of the participants, with the exception of Seunghoon, first created separate sections in their notes (on either paper hand-out or Word document) for fiat currency and cryptocurrency. Then, as they continued their L2 ORC sessions and read relevant web pages, they filled in each section with newly found information. Kyungmin and Youngmi, who took notes on Microsoft Word, also rearranged the contents of their notes to assist their comprehension task.

#### **4.3.4 Summary**

In short, the successful L2 ORC demonstrated by each of the six participants was characterized by the interplay of strategies for constructing a coherent reading path and those for comprehending single and multiple digital texts. Most notably, the participants predicted the usefulness of web pages from the search results based on the criteria of relevance and credibility before accessing them. On each web page, the participants demonstrated selective reading by quickly scrolling through text deemed as irrelevant or unnecessary. Their evaluation of the usefulness of text was also informed by what they had previously read, indicating that they were in the process of forming a coherent mental representation from text across multiple web pages.

## **Chapter 5. Discussion**

The current study delved into strategy use behind L2 ORC by analyzing the screen recordings and stimulated recall data from L2 ORC conducted by six Korean tertiary-level learners of English. In the previous chapter, descriptive accounts of the participants' L2 ORC sessions were presented along with the constructively responsive reading strategies they utilized in order to meet the task demands. In this chapter, the results are discussed in terms of the distinct characteristics of L2 ORC they reveal and the individual variation in L2 ORC that was observed.

### **5.1 The Distinctive Characteristics of L2 ORC**

The strategies utilized by the six participants shed light on the distinct nature of L2 ORC by unveiling the cognitive processes it demands from readers. The various strategies for constructing a coherent reading path as well as comprehending single and multiple digital texts that were identified provide further empirical support to the observation that successful ORC requires the use of both strategies for print-based reading and those unique to the Internet context (Afflerbach & Cho, 2009; Cho, 2014; Cho & Afflerbach, 2017; Coiro, 2007; Coiro & Dobler, 2007; Konishi, 2003; H.-R. Park & Kim, 2011; Schmar-Dobler, 2003; Zhang & Duke, 2008). While a direct comparison to other research studies on reading strategy use would be untenable due to differences in the reader-text-task combination (Joh, 2014), strategy use that might be distinctive of L2 ORC is

highlighted in this section. This is discussed in light of “print-based” L2 reading—the current instructional focus of secondary classrooms—and “L1” ORC, which Korean learners of English are especially accustomed to.

### **5.1.1 In Comparison to Print-based L2 Reading: Path Construction and Multiple-text Synthesis**

As the Internet is a vast hypertext system, it was crucial that the participants narrow down the scope of information by continuously seeking web pages that were relevant and useful to the task demands. Due to the superfluous amount of information on each web page, they also had to demonstrate selective reading by adjusting their reading speed and level of concentration. In other words, the reader needs to be more active and critical while constructing a reading path in terms of deciding which text to read, which portions of text to read, and in which sequence to read during ORC. This behavior is less likely to be observed from print-based reading, in which the text is usually determined before the actual act of reading and read in its entirety.

The participants initiated their L2 ORC sessions by choosing a search engine and entering a search term into it. Guiding their choices was their prior knowledge of how different search engines lead to different sets of information. This echoes Coiro and Dobler’s (2007) observation that ORC demands the application of additional prior knowledge, such as that of web-based search engines, in comparison to print-based reading. As evidenced by the participants’

post-task interviews, such prior knowledge seemed to stem largely from their previous experience with searching the Internet for various information.

Another strategy use that contributed to the construction of the participants' reading paths was the active and critical evaluation of the usefulness of each web page on the search results. The participants grounded their evaluation in two main criteria: relevance of the web page title to the task demands and the credibility of the source of information. In other words, they selected web pages with titles that were highly relevant to the task as well as those that were hosted on websites that were judged to be trustworthy. Again, the participants' previous experience with particular websites (e.g., Quora) and online media platforms (e.g., HuffPost) played a significant role in the selection of specific web pages. Such critical evaluation of given information does not appear often in print-based reading.

The participants constructed their reading paths not only across different web pages but also within individual web pages by adjusting their reading speed and level of concentration. They first quickly scanned and skimmed the page to identify relevant and unique information and then slowed down their reading speed to process it carefully. This strategy use seems to have been driven by their need to locate and extract useful information from the superfluous amount of text on each web page. Such scanning and skimming, which have been noted as essential strategies for ORC in comparison to print-based reading by Schmar-

Dobler (2003), were in part assisted by navigation functions such as *Find* (*Ctrl + F*) and hyperlinks that shift the screen to a different portion of the web page. Such adept use of navigation functions serves as an example of how ORC can be conceived of as a combination of six elements—reader, text, author, task, context, and technology—with technology gaining more importance in Internet contexts (Hartman, Morsink, & Zheng, 2010).

As the participants followed the reading paths they were constructing, they also made effort to synthesize content across multiple web pages into a coherent mental representation. This mental representation that was in the making influenced the participants' actions—most prominently their choices to either closely read or reject the text that they encountered. For instance, if the contents of a web page were deemed as redundant in light of previously read text, the participants quickly exited it in search of web pages that would make unique contributions to the task demands. In addition, a gap in what they have comprehended from the searched web pages in light of the information necessary to fulfill the given task directed their additional search for corresponding information. Such monitoring of the current state of comprehension and taking deliberate actions in response exemplifies the expert reading proposed in Pressley and Afflerbach's (1995) original model of constructively responsive reading.

### **5.1.2 In Comparison to L1 ORC: Online Resource Use and Avoidance Strategies**

In light of the model of constructively responsive reading and empirical studies on L1 ORC, there were few strategies observed in this study that were uniquely distinctive of L2 ORC to the extent they demanded a new category. In other words, the majority of the strategies employed by the participants of the current study could be accounted for by Cho and Afflerbach's (2017) categorization of strategies for reading in Internet contexts. This is similar to how the strategies for successful L1 and L2 print-based reading largely overlap, with mental translation to the reader's native language being the only noteworthy L2-specific strategy (Grabe, 2009).

Nonetheless, the comprehension problems posed by the L2 text directed the participants to refer to online resources such as bilingual dictionaries and translators to support their reading. These online resources assisted the participants' comprehension from two perspectives. First and more prominently, these resources provided explanations of technical terminology that the participants with minimal topical prior knowledge encountered for the first time during their L2 ORC sessions. Additionally, a more L2-specific online resource use for finding the Korean definitions of English text was also observed. Such translation, which ranged in scope from single words to entire paragraphs, helped to close the gap between L2 ORC and L1 ORC. These examples

demonstrate how learners of English seek linguistic support from online resources while reading on the Internet (H.-R. Park & Kim, 2011; J. Park et al., 2014).

The perceived comprehensibility of L2 text also served as a criterion for evaluating the usefulness of text, which consequently led readers to avoid reading text found to be beyond their comprehension level. This was evident in how some participants skipped reading paragraphs of text or even rejected an entire web page based on their judgement that they would be too difficult for them to understand. Sometimes this criterion of comprehensibility assumed higher priority than the credibility of source in the selection of a web page, as was depicted in the example where one participant returned to a web page previously deemed as untrustworthy in expectation of more comprehensible text.

## **5.2 Individual Variation in L2 ORC**

It was especially difficult to precisely measure how fluently each of the six participants completed the L2 ORC task due to the inherent difference in the scope and amount of text that was read by each participant (Hartman et al., 2010; Leu et al., 2016). However, it was clear from the responses to the comprehension task that all of the participants had located relevant web pages and synthesized information from them without being overwhelmed by the task demands. This indicates that their L2 ORC was successful in general and therefore is representative of high-proficiency L2 ORC.

One consideration in the selection of participants for the current study was to seek a varied sample that would demonstrate diversity in strategy use during L2 ORC. While the complex nature of strategy use observed in this study made it difficult to profile each of the six participants, their L2 ORC could be roughly categorized according to Cho's (2011) distinction between *RC-driven reading* and *IL-driven reading*. Based on Afflerbach and Cho's (2009) four categories of *Identifying and Learning Text Content*, *Monitoring*, *Evaluating*, and *Realizing and Constructing Potential Texts to Read*, Cho (2011) distinguished the two modes of reading based on the dominant type of strategy use. That is, extensive strategy use for *Realizing and Constructing Potential Texts to Read (RC)* characterizes RC-driven reading, while that for *Identifying and Learning Text Content (IL)* characterizes IL-driven reading. In other words, a reader's ORC could be categorized according to whether they dedicated more attentional resources towards constructing a reading path or making meaning from the located texts.

In this study, Seunghoon, Kyungmin, and Taeyeon demonstrated L2 ORC that was closer to RC-driven reading, while Jiwoo, Minseo, and Youngmi's L2 ORC was more similar to IL-driven reading. Although the reason behind such individual difference is unclear, the participants' level of L2 reading fluency and different standards of relevance seem to have influenced their L2 ORC styles. The impact of reading fluency was most obvious in the case of

Jiwoo; her limited English reading fluency confined her to stay within a same web page for a prolonged amount of time and therefore made it difficult for her to navigate across different content web pages within the time limit. In contrast, Taeyeon's fluent reading enabled her to quickly obtain the information she needed from each web page and move on to subsequent web pages. This echoes Coiro's (2007) observation that a reader's fluency with traditional print text was one of the key dimensions that differentiated ORC of different proficiency levels.

Another factor that might have affected the participants' reading style was the different standards of relevance that they brought to the L2 ORC task. That is, the participants stood on a different understanding of what counts as a "difference between fiat currency and cryptocurrency," which in turn influenced their decision on which portions of the text to closely read and integrate into their responses to the comprehension task. For example, Seunghoon and Kyungmin only looked for the most direct and contrastive points and therefore considered most of the information they had encountered to be irrelevant to the task. This directed the two readers to quickly reject most of the web pages they had accessed, especially towards the end of their L2 ORC sessions. On the contrary, Youngmi also read for more specific details on each of the two key concepts (i.e., fiat currency and cryptocurrency) to support her response to the comprehension task, which made her remain within a same web page for an

extended period of time. Although the same reading task was administered to all of the participants in this study, the different goals for reading that stemmed from their distinct interpretations of the task directions (i.e., reading to find direct answers as opposed to reading to find supporting details) led to such variation in strategy use. This is in line with Zhang and Duke's (2008) finding that the goals readers hold while reading significantly impact strategy use in Internet contexts as well.

## **Chapter 6. Conclusion**

This chapter concludes the thesis by summarizing the major findings of the current study. The implications and the research limitations of the study are also discussed.

### **6.1 Summary of Major Findings**

The current study delved into strategy use behind L2 ORC by examining the screen recordings and stimulated recall data from L2 ORC conducted by six Korean tertiary-level learners of English. The recursive analysis of the six participants' L2 ORC sessions revealed that a wide variety of strategy use contributed to their successful L2 ORC.

As Cho and Afflerbach (2017) conceptualized the strategies required for reading that takes place on the Internet, all six participants of the current study utilized strategies for constructing a coherent reading path as well as comprehending single and multiple digital texts in order to meet the task demands. Most notably, the participants predicted the usefulness of web pages from the search results based on the criteria of relevance and credibility. On each web page, the participants demonstrated selective reading by quickly scrolling through text deemed as irrelevant or unnecessary. The participants' evaluation of the usefulness of text was in part informed by what they had previously read, indicating that they were in the process of forming a coherent mental representation from text across multiple web pages.

These results provide further empirical support to the observation that successful ORC requires the use of both strategies for print-based reading and those unique to the Internet context. They also shed light on how L2 ORC might entail different cognitive demands from either print-based L2 reading or L1 ORC; the “Internet” aspect of L2 ORC demands that readers construct their reading paths and synthesize multiple texts, whereas the “second language” aspect of L2 ORC may require the use of online resources as well as the avoidance of incomprehensible text. While the six participants’ L2 ORC was generally successful, they could be roughly categorized according to whether the reader’s primary focus was on constructing a reading path or making meaning from the located texts. This variation in strategy use seems to have been influenced by the participant’s level of L2 reading fluency as well as exactly what they considered to be relevant to the task demands.

## **6.2 Implications of the Findings**

In general, the results of the current study provide more detail on the unique nature of L2 ORC and thereby reveal how the Internet has impacted reading in a second language. These findings have noteworthy implications for L2 reading theory, instruction, and assessment.

### **6.2.1 Implications for Reading Theory**

The most obvious implication of the strategy use behind L2 ORC identified in this study is that the current conception of L2 reading needs to be

expanded to encompass the novel challenges posed by the Internet. As demonstrated by the participants of the current study, solely relying on strategies for traditional print-based L2 reading does not guarantee successful L2 ORC; readers also need to construct their individualized reading path and synthesize information from multiple texts as they follow it. This lends empirical support to the framework of New Literacies, which posits that ICT has profoundly changed the nature of literacy (Coiro et al., 2008; Leu et al., 2004, 2013).

Such additional complexity in L2 reading presented by ICT poses another fundamental question to be addressed through empirical research. This concerns the extent to which component abilities of relevant domains (e.g., print-based L2 reading) are necessary for successful L2 ORC. The multifaceted nature of reading in another language has long been noted in the literature, as succinctly worded by Alderson (1984): “Foreign language reading: a reading problem or a language problem?” (p. 1). We might expand his famous question to something like this: *L2 ORC: a reading problem, a language problem, or an Internet problem?* Identifying the component abilities required for successful L2 ORC (e.g., reading fluency, vocabulary knowledge, and experience on the Internet) and investigating their relative contribution to it can further explicate how L2 ORC is similar to or distinct from print-based L2 reading. Additionally, it can also help shape educational practices that are essential for training students to become literate members of society in a new literacies era.

### **6.2.2 Implications for Reading Instruction**

Given the findings of the current study that shed light on the strategies necessary to successfully engage in L2 ORC, there is no doubt that our students need to learn how to utilize them appropriately in order to explore the Internet and complete a similar type of task to the one administered in this study.

Researchers and practitioners in the field of literacy instruction have already begun to discuss how traditional instructional models for reading strategies could be applied to ORC. One such example is Internet reciprocal teaching (IRT; Leu et al., 2005, 2008), which is an adaptation of reciprocal teaching, an instructional approach noted as effective for teaching reading strategies. The most significant element of IRT is its increased emphasis on the students' (i.e., in contrast to the teacher's) modeling of strategies to the class, which is based on the acknowledgement that the students may be more literate than the teacher on the Internet and thus have unique knowledge and strategies to share with others (Leu et al., 2007, 2008). The wide range of prior knowledge and dispositions the six participants of the current study brought to their L2 ORC provides support for this assumption and further emphasizes the need for student-centered literacy instruction.

But before we can discuss how to integrate strategy instruction for L2 ORC into secondary English language classrooms in Korea, a detailed analysis of our students' needs must be preceded. On a similar note to the research

agenda discussed in the previous section, this deals with the extent to which the abilities that students already possess readily transfer to L2 ORC. For instance, Leu, Forzani, et al. (2015) note that experience on the Internet is crucial to the development of ORC skills for adolescents in the U.S., pointing out an achievement gap in ORC that is statistically independent from that in print-based reading. Although yet to be verified through research, it seems likely that L2 ORC would be less of “an Internet problem” for Korean students. This is due to the fact that Internet use is exceptionally widespread in Korea, where 99.9% of adolescents between the ages of 10 and 19 are identified as Internet users (MCIT & KISA, 2018).

Regardless, the results of the current study indicate that successful L2 ORC requires the appropriate use of reading strategies that are essential in Internet contexts, such as those for constructing a reading path and comprehending multiple digital texts. Our current L2 reading instruction needs to start reflecting this change in the nature of literacy by encouraging students to extend their L2 reading to Internet contexts and experience for themselves the wider scope of information that ORC in Korean does not allow. Specifically how this is achieved in the classroom, however, should be grounded in solid research findings on what our students’ actual needs are.

### **6.2.3 Implications for Reading Assessment**

The findings of this study demonstrate that the construct of L2 reading

ability has been significantly expanded by the Internet. As a consequence, this prompts second language assessment experts to begin discussing ways to reflect this change onto existing reading assessments. Otherwise, scores from a reading assessment that represents only the “print-based” portion of the construct would have lower validity to be interpreted as indicators of such an expanded construct of L2 reading ability.

At the same time, the L2 ORC conducted by the six participants of this study offers a glimpse into the challenges linked to developing assessment tasks that measure L2 ORC proficiency. As noted in the literature, ORC suffers from a measurement issue because the scope and amount of text to be read by each reader remains indeterminate (Hartman et al., 2010; Leu et al., 2016). In other words, it is impossible to expect what proficient readers will comprehend as a result of their ORC because it is largely up to the reader to decide what to read. This is further complicated by the fact that the text and information on the Internet constantly changes. Such flexible nature of the Internet makes it difficult to utilize highly controlled tasks such as multiple-choice questions that ask readers to locate certain information in “the text” in the assessment of L2 ORC.

One can conceive of implementing more open-ended tasks like the comprehension task adopted in the current study to mitigate this issue. However, these also have drawbacks in that their scoring procedure is time-consuming, which makes them inefficient to use—particularly in a large-scale testing

situation. Another potential solution could be to create a closed, multiple-text reading environment akin to the Internet for the purpose of assessment. This will nonetheless result in L2 ORC that is less authentic, most notably from the perspective of actively constructing a reading path. Needless to say, the trade-off relationship between practicality and authenticity is especially salient in the assessment of L2 ORC. Thus, in order to strike a balance between the two and inform the development of assessment tasks for L2 ORC, further research into its construct definition is necessary.

### **6.3 Limitations and Suggestions for Future Research**

The current study revealed strategy use behind L2 ORC that provides ample insight into how the Internet has impacted reading in a second language. Nonetheless, this study is not without its research limitations. First, the size of the participant sample of this study was relatively small, largely due to the qualitative nature of the research methodology. Consequently, the results may only generalize to its closest peers such as other tertiary-level learners of English with a similar profile. Second, as suggested by the post-task interview, the time limit of the L2 ORC task administered in this study influenced the participants' reading behavior. Although this time limit had to be incorporated due to practical reasons, it nonetheless induced L2 ORC that is different from that in an unconstrained setting. Finally, the data collection procedure of this study relied primarily on the use of stimulated recall, which took place after the actual act of

reading. While this allowed the L2 ORC the participants engaged in to be kept more natural without imposing an excessive amount of cognitive load on them, this also resulted in verbal data that was less detailed than what would have been collected through a think-aloud protocol. Therefore, the results and implications of this study need to be evaluated incorporating these research limitations.

To mitigate the issue with the limited generalizability of the study, a replication study could be conducted with secondary-level students with a more diverse profile (e.g., in terms of English reading proficiency and Internet experience) for a picture of what L2 ORC in the process of acquisition might look like. This would also shed light on the extent to which L1 ORC skills or print-based L2 reading skills readily transfer to L2 ORC. Moreover, additional research effort is needed to develop, pilot, and validate assessment tasks that can reliably measure L2 ORC proficiency. Such tasks would not only inspire larger-scale research but also serve as valuable diagnostic tools for the day when fostering L2 ORC skills becomes a key instructional objective in our English language classrooms.

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# Appendices

## Appendix A: Constructively Responsive Reading Strategies Outlined in Cho and Afflerbach (2017)

### *Thumbnail Sketch of Constructively Responsive Strategies for Comprehending a Single Digital Source*

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#### 1. Meaning making

- Overviewing the content of digital text (web page, websites, pdf document, etc.) to determine what is there and decide which parts to process before reading the text closely.
- Looking for important information written or visualized in text and paying greater attention to it than other information.
- Attempting to relate important points in text to one another in order to understand the text as a whole.
- Activating and using prior knowledge to interpret text, generating hypotheses about text, and predicting text content.
- Relating text content to prior knowledge, especially as part of constructing interpretations of text.
- Reconsidering and/or revising hypotheses about the meaning of text based on text content.
- Reconsidering and/or revising prior knowledge based on text content.
- Attempting to infer information not explicitly stated in text when the information is critical to comprehension of the text.
- Attempting to determine the meaning of words not understood or recognized, especially when a word seems critical to meaning construction.
- Using strategies to remember text (reviewing, summarizing, paraphrasing, self-questioning, etc.).

#### 2. Monitoring

- Adjusting reading speed and concentration depending on the perceived importance of text to reading goals.
- Changing reading strategies when comprehension is perceived not to be proceeding smoothly.
- Reflecting on and processing text additionally after a part of text has been read or after a reading is completed (reviewing, questioning, summarizing, attempting to interpret, evaluating, considering alternative interpretations and possibly deciding between them, considering how to process the text additionally if there is a feeling it has not been understood as much as it needs to be understood, accepting one's understanding of the text, rejecting one's understanding of a text).
- Carrying on responsive conversation with the author.
- Anticipating or planning for the use of knowledge gained from reading.

#### 3. Evaluating

- Rating the importance of text content and determining the usefulness in accordance with reading goals.

(continued)

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- Judging style of digital text, including word choices, sentence fluency, information organization, logical structure of main points and supporting details, visual attractiveness, easy-to-read features, and overall layout and design.
  - Evaluating author's purposes, intentions, and goals based upon the analysis of the assumptions, worldviews, and beliefs that are often hidden in text.
  - Assessing the qualities of text, with these evaluations in part affecting whether text has impact on reader's knowledge, attitudes, behavior, and so on.
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### *Constructively Responsive Reading Comprehension Strategies for Multiple Digital Texts*

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#### 1. Identifying intertextual links and making meaning from across texts

- Reading and relating the current text to recently read (prior) texts.
- Predicting contents of current text based on understanding of previous text.
- Comparing and contrasting the content of the text being read with the content of related texts to develop a coherent account of cross-textual contents.
- Generating causal inferences by searching for relationships between texts and connecting information from current text with previous text contents.
- Elaborating with information from current act of reading (of two or more texts) to understand text contents by connecting ideas between texts.
- Identifying a theme or topic across multiple texts.
- Making meanings from different multimodal texts (e.g., written paragraphs, images, charts and tables, videos) and determining contribution of each modal information (dominant mode, secondary mode, etc.) to a coherent understanding of the texts.
- Attending to an identified theme or topic across two or more texts to organize and remember this information.
- Organizing related information across texts by using related strategies (e.g., concept mapping, outlining, summarizing).
- Activating knowledge acquired in previous readings to augment comprehension of the current text.
- Noting tentative meaning of texts and searching for information in other texts to reduce the ambiguity in this tentative meaning.
- Reading sections of different texts recursively, as required to solve problems across multiple texts.
- Building increased understanding of topic by rereading the information contained in two or more texts.
- Using the increased understanding (new insights) to further learn from multiple texts.
- Taking notes to record information from current text and connect it to related information from previous texts.
- Focusing on gist information across multiple texts to recursively construct meaning.
- Rereading and linking text segments that were previously regarded as unrelated to finalize crosstextual meaning structures.
- Identifying the unique and shared contributions of information to the constructed meaning of two or more texts.
- Summarizing content of text(s) in relation to the reading task.

(continued)

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## 2. Monitoring the construction of intertextual relationships

- Managing the local processing in one or multiple texts (e.g., constructing meaning from a paragraph) and the global processing in one or multiple texts (e.g., managing the synthesis of the constructed meaning of the paragraph with all related paragraphs to account for the entire reading).
- Detecting a comprehension problem with a particular text and trying to solve the detected problem by searching for clarifying information in other available texts.
- Changing strategic processing foci from understanding within-text meaning to integrating across-text meaning by utilizing domain knowledge increased due to previous readings, during the sequential readings (i.e., decreasing links to primary endogenous resources and increasing connections to secondary endogenous resources when moving through the passages).
- Monitoring comprehension strategies and meaning construction with current text in relation to constructed meanings of other relevant texts.
- Monitoring degree and nature of comprehension of a current passage by referencing exogenous sources, using knowledge established previously (beyond the current set of documents).
- Regulating meaning construction strategies according to original task and goal and revised task and goal.
- Perceiving that multiple texts related to the same topic can provide diverse and contrasting views about the topic, complementary information about the topic, or both.
- Managing meaning construction through understanding that different types of texts can contribute different types of knowledge to that meaning construction (i.e., primary and secondary source texts may make different contributions to the construction of meaning).
- Determining that existing content domain knowledge or expertise, including specific strategies and knowledge, can be used when studying multiple texts in a specific domain.

## 3. Evaluating and sourcing multiple digital texts

- Using information about a present source to evaluate and interpret text content.
  - Perceiving and distinguishing the characteristics of different texts (e.g., text types, age, author, prose styles) and evaluating texts' accuracy.
  - Perceiving and distinguishing the characteristics of different texts (e.g., text types, age, author, prose styles) and evaluating texts' trustworthiness based on these features.
  - Perceiving and distinguishing the characteristics of different texts (e.g., text types, age, author, prose styles) and evaluating their usefulness for constructing meaning based on these features.
  - Gestalt evaluation of text, employing a variety of criteria, to decide if text is useful in constructing overall meaning from several texts.
  - Critically evaluating validity and reliability of texts by criteria of text contents, author's point of view, and context, using a cumulative representation of a whole document set.
  - Conduct a text-to-text evaluation using a gestalt impression of each text.
  - Evaluate one text in relation to another, using specific information in each text (e.g., comparing claim and evidence in two or more texts).
  - Judging usefulness of information provided by a single text in relation to other text.
  - Evaluating contribution of text(s) to proximal and distal reading and task goals.
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## *Constructively Responsive Reading Comprehension Strategies Used During the Construction of Reading Paths*

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### 1. Managing information spaces and navigating toward useful texts

- Accessing and overviewing a goal-relevant information space by searching for relevant websites or information retrieval systems.
- Reducing and managing the range of possible information to be encountered by generating and modifying search terms related to topic and focus of a particular task.
- Accessing goal-relevant websites to gain an overview and to learn possible target information, activating prior knowledge.
- Accessing complementary sources (e.g., Wikipedia, Twitter) to get background information or to survey references.
- Scrutinizing hyperlinks to anticipate and judge the usefulness and significance of the information before accessing it, based on specific reading goals.
- Exploring and sampling goal-related information in Internet hypertexts at the initial stage of reading to establish a dynamic plan to achieve one's own goal.
- Predicting utility of a link within Internet text when confronted with more than one hypertext link.
- Generating inferences about the relevance (or goodness of fit) of at least some of the other links on the pages visited prior to main act of reading.
- Reserving a website as a potential source for the current information search and later stage of reading, or reject it.
- Choosing and sequencing the reading order by accessing links based on the criteria of coherence among links and relevance to situational interests.
- Conducting complementary searches with modified or revised key words in order to better clarify suitability of links and potential reading path.

### 2. Building intertextual linkages and making meanings from hypertexts

- Using navigation functions to select, structure, and create environments to assist in constructing text meaning.
- Using website structures to help construct meaning.
- Using website search engines to help construct meaning.
- Searching in Internet hypertext environments for information related to already established meaning.
- Linking to additional Internet sites to obtain more information that is related to but beyond the original goal (e.g., linking to Google, then to a listed Google website, then to subsidiary websites while searching for information, because the links appear promising).
- Using multilayered inferences across the three-dimensional space of Internet hypertext to anticipate meaning of texts that are hidden from view, or to be encountered.
- Retaining information (e.g., cutting and pasting or highlighting important information) using computer and software tools.
- Backlinking and revisiting pages to revise constructed meaning.
- Revising reading goals based on experiences and progress on hypertext path to resolution.
- Combining disparate forms of information to construct meaning, including text, graphics, illustrations, and embedded video.

(continued)

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- Using the meaning constructed in the course of navigating and reading multiple texts to build an integrative mental model (e.g., forming, developing, modifying, and confirming a mental representation)

### 3. Monitoring the construction of reading paths

- Determining that an aspect of Internet hypertext reading needs attention.
- Determining that an alternative way to navigate Internet hypertext is needed because the current means of navigation is ineffective.
- Changing search engine to navigate Internet hypertext.
- Changing search strategy to navigate Internet hypertext.
- Determining that found Internet sites are not helpful to the task or goal.
- Determining that Internet hypertext content is not comprehensible due to form, structure, new information, or a combination of these.
- Noting disorientation due to difficulty in locating specific information in Internet hypertext.
- Noting disorientation due to problems using the application functions in Internet hypertext.
- Perceiving meaning construction problems due to diversity of information encountered.
- Perceiving meaning construction problems due to volume of information encountered.
- Perceiving meaning construction problems due to managing information overload.
- Noting problems while searching for information that is expected/anticipated and perceived to be valuable but is not found or available.
- Managing disorientation by increasing memory allocation to solve the problem of disorientation.
- Managing disorientation to refocus on original search plan and goal(s).
- Realizing that original goal for reading needs revision based on Internet hypertext–reader interaction to current point in reading.

### 4. Evaluating and sourcing multilayered links and texts

- Evaluating the possible paths through Internet hypertext to successful completion of task(s), using standards of breadth and depth.
  - Assessing relevance and usefulness of information in relation to the tentative meaning constructed through the initial and ongoing exploration.
  - Assessing the credibility of information found in Internet hypertext environment (e.g., author reputation, source reliability, sponsorship, up-to-datedness, publishing types).
  - Assessing the clarity of information found in Internet hypertext environment (e.g., structures, layouts, languages).
  - Evaluating the Internet hypertext links that the reader accesses in relation to an imagined or proposed solution path to achieve goals, using an anticipatory “goodness of fit.”
  - Assessing relative value of websites and web pages that are determined to have related information.
  - Evaluating URL of website to make determination of usefulness, suitability, or trustworthiness of information.
  - Evaluating entry shorthand (e.g., 10 sites per page listed by Google) to make determination of usefulness, suitability, or trustworthiness.
  - Evaluating nature, tone, or feel of a website and deciding to use (or not use) it.
  - Evaluating the result of a search or move in Internet hypertext.
-

## Appendix B: Translated Version of Preliminary Screening Survey

1. Major (also indicate if you have a double-major or minor): \_\_\_\_\_
2. Gender: (1) Male (2) Female
3. Year of study (e.g., undergraduate senior, 2nd semester of master's): \_\_\_\_\_
4. Is your native language (i.e., the first language you learned after birth) Korean? This study is only for native speakers of Korean. (1) Yes
5. Authorized English test score (e.g., TEPS, TOEIC, TOEFL): \_\_\_\_\_
6. Indicate the length of your experience in an English-medium academic environment (e.g., study abroad, international school, exchange student), if applicable: \_\_\_\_\_
7. About how long do you use the Internet in Korean per week? (including PC and mobile)  
(1) Less than 7 hours (2) 7 to 14 hours (3) 14 to 21 hours  
(4) 21 to 28 hours (5) 28 to 35 hours (6) More than 35 hours
8. What is your primary purpose of Internet use in Korean? (select more than one if applicable)  
(1) Communication (e.g., instant messenger, social media, e-mail)  
(2) Obtaining data and information (e.g., information search, reading news articles)  
(3) Leisure (e.g., listening to music, watching videos, playing online games)  
(4) Operating web pages (5) Education/learning (6) Job/work-related  
(7) Other: \_\_\_\_\_
9. About how long do you use the Internet in English per week? (including PC and mobile)  
(1) Less than 3 hours (2) 3 to 6 hours (3) 6 to 9 hours  
(4) 9 to 12 hours (5) 12 to 15 hours (6) More than 15 hours
10. What is your primary purpose of Internet use in English? (select more than one if applicable)  
(1) Communication (e.g., instant messenger, social media, e-mail)  
(2) Obtaining data and information (e.g., information search, reading news articles)  
(3) Leisure (e.g., listening to music, watching videos, playing online games)  
(4) Operating web pages (5) Education/learning (6) Job/work-related  
(7) Other: \_\_\_\_\_
11. How well do you know about fiat currency and cryptocurrency?  
(1) know nothing — (2) — (3) — (4) know somewhat — (5) — (6) — (7) know very well

## Appendix C: List of Web Pages Accessed by Each Participant During Their

### L2 ORC Session

#### *List of Web Pages Accessed by Jiwoo*

Title (Website)	Address
“Are Cryptocurrencies Just More Fiat Money?” (HuffPost)	<a href="https://www.huffingtonpost.com/entry/are-cryptocurrencies-just-more-fiat-money_us_5a385087e4b0c12e6337b014">https://www.huffingtonpost.com/entry/are-cryptocurrencies-just-more-fiat-money_us_5a385087e4b0c12e6337b014</a>
“Fiat Currency Vs Digital Currency” (Digital Money Times)	<a href="http://digitalmoneytimes.com/fiat-currency-vs-digital-currency/">http://digitalmoneytimes.com/fiat-currency-vs-digital-currency/</a>
“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)	<a href="https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/">https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/</a>
“What’s the difference between fiat and cryptocurrencies?” (Quora)	<a href="https://www.quora.com/Whats-the-difference-between-fiat-and-cryptocurrencies">https://www.quora.com/Whats-the-difference-between-fiat-and-cryptocurrencies</a>
Google	<a href="https://www.google.co.kr">https://www.google.co.kr</a>
NAVER	<a href="https://www.naver.com">https://www.naver.com</a>

#### *List of Web Pages Accessed by Seunghoon*

Title (Website)	Address
“Are Cryptocurrencies Just More Fiat Money?” (HuffPost)	<a href="https://www.huffingtonpost.com/entry/are-cryptocurrencies-just-more-fiat-money_us_5a385087e4b0c12e6337b014">https://www.huffingtonpost.com/entry/are-cryptocurrencies-just-more-fiat-money_us_5a385087e4b0c12e6337b014</a>
“Crypto-currency vs Fiat currency” (YouTube)	<a href="https://www.youtube.com/watch?v=xPDfE66LSHo">https://www.youtube.com/watch?v=xPDfE66LSHo</a>
“Cryptocurrency Vs Fiat (Cash money)” (Baseberry)	<a href="https://baseberry.com/what-is-the-difference-between-cryptocurrency-and-fiat/">https://baseberry.com/what-is-the-difference-between-cryptocurrency-and-fiat/</a>
“The Difference Between Cryptocurrencies, Digital Currencies and Fiat Currencies” (Core Sector Communique)	<a href="http://corecommunique.com/difference-cryptocurrencies-digital-currencies-fiat-currencies/">http://corecommunique.com/difference-cryptocurrencies-digital-currencies-fiat-currencies/</a>
“The difference between cryptocurrencies, digital currencies, fiat currencies and tokens” (Marketing in Digital Times)	<a href="http://marketingindigitaltimes.com/difference-cryptocurrencies-digital-currencies-fiat-currencies-tokens">http://marketingindigitaltimes.com/difference-cryptocurrencies-digital-currencies-fiat-currencies-tokens</a>
“The difference between fiat and cryptocurrency” (Steemit)	<a href="https://steemit.com/bitcoin/@clixmoney/the-difference-between-fiat-and-cryptocurrency">https://steemit.com/bitcoin/@clixmoney/the-difference-between-fiat-and-cryptocurrency</a>
“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)	<a href="https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/">https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/</a>
“There’s a Big Difference Between Electronic Fiat and Cryptocurrency” (Bitcoin News)	<a href="https://news.bitcoin.com/big-difference-electronic-fiat-cryptocurrency/">https://news.bitcoin.com/big-difference-electronic-fiat-cryptocurrency/</a>
“What’s the difference between fiat and cryptocurrencies?” (Quora)	<a href="https://www.quora.com/Whats-the-difference-between-fiat-and-cryptocurrencies">https://www.quora.com/Whats-the-difference-between-fiat-and-cryptocurrencies</a>
Google	<a href="https://www.google.co.kr">https://www.google.co.kr</a>

### *List of Web Pages Accessed by Minseo*

Title (Website)	Address
“Cryptocurrency” (Wikipedia)	<a href="https://en.wikipedia.org/wiki/Cryptocurrency">https://en.wikipedia.org/wiki/Cryptocurrency</a>
“Fiat money” (Investopedia)	<a href="https://www.investopedia.com/terms/f/fiatmoney.asp">https://www.investopedia.com/terms/f/fiatmoney.asp</a>
“Is Bitcoin a fiat currency?” (Capital & Conflict)	<a href="https://www.capitalandconflict.com/investing-in-bitcoin/bitcoin-fiat-currency/">https://www.capitalandconflict.com/investing-in-bitcoin/bitcoin-fiat-currency/</a>
“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)	<a href="https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/">https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/</a>
Google	<a href="https://www.google.co.kr">https://www.google.co.kr</a>
Naver English Dictionary	<a href="http://endic.naver.com/">http://endic.naver.com/</a>

### *List of Web Pages Accessed by Kyungmin*

Title (Website)	Address
“Bitcoin is fiat money, too – Not so novel” (The Economist)	<a href="https://www.economist.com/blogs/freexchange/2017/09/not-so-novel">https://www.economist.com/blogs/freexchange/2017/09/not-so-novel</a>
“Cryptocurrency and Fiat Money” (American Thinker)	<a href="https://www.americanthinker.com/articles/2018/01/cryptocurrency_and_fiat_money.html">https://www.americanthinker.com/articles/2018/01/cryptocurrency_and_fiat_money.html</a>
“Cryptocurrency: Mining, investing, and trading in blockchain for beginners” (Google Books)	<a href="https://books.google.co.kr/books?id=BnlFDwAAQBAJ">https://books.google.co.kr/books?id=BnlFDwAAQBAJ</a>
“Cryptocurrency” (Wikipedia)	<a href="https://en.wikipedia.org/wiki/Cryptocurrency">https://en.wikipedia.org/wiki/Cryptocurrency</a>
“Fiat Currency Vs Digital Currency” (Digital Money Times)	<a href="http://digitalmoneytimes.com/fiat-currency-vs-digital-currency/">http://digitalmoneytimes.com/fiat-currency-vs-digital-currency/</a>
“Fiat money vs Cryptocurrency” (The Bitcoin Report)	<a href="http://www.thebitcoinreport.nl/artikelen/16/fiat-money-vs-cryptocurrency">http://www.thebitcoinreport.nl/artikelen/16/fiat-money-vs-cryptocurrency</a>
“Fiat money” (Wikipedia)	<a href="https://en.wikipedia.org/wiki/Fiat_money">https://en.wikipedia.org/wiki/Fiat_money</a>
“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)	<a href="https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/">https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/</a>
“There’s a Big Difference Between Electronic Fiat and Cryptocurrency” (Bitcoin News)	<a href="https://news.bitcoin.com/big-difference-electronic-fiat-cryptocurrency/">https://news.bitcoin.com/big-difference-electronic-fiat-cryptocurrency/</a>
Google	<a href="https://www.google.co.kr">https://www.google.co.kr</a>
Naver Dictionary	<a href="http://dic.naver.com/">http://dic.naver.com/</a>

*List of Web Pages Accessed by Youngmi*

Title (Website)	Address
“Cryptocurrency” (Wikipedia)	<a href="https://en.wikipedia.org/wiki/Cryptocurrency">https://en.wikipedia.org/wiki/Cryptocurrency</a>
“Fiat Currency Vs Digital Currency” (Digital Money Times)	<a href="http://digitalmoneytimes.com/fiat-currency-vs-digital-currency/">http://digitalmoneytimes.com/fiat-currency-vs-digital-currency/</a>
“Fiat money” (Wikipedia)	<a href="https://en.wikipedia.org/wiki/Fiat_money">https://en.wikipedia.org/wiki/Fiat_money</a>
“Representative money” (Wikipedia)	<a href="https://en.wikipedia.org/wiki/Representative_money">https://en.wikipedia.org/wiki/Representative_money</a>
“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)	<a href="https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/">https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/</a>
“There’s a Big Difference Between Electronic Fiat and Cryptocurrency” (Bitcoin News)	<a href="https://news.bitcoin.com/big-difference-electronic-fiat-cryptocurrency/">https://news.bitcoin.com/big-difference-electronic-fiat-cryptocurrency/</a>
“What’s the difference between fiat and cryptocurrencies?” (Quora)	<a href="https://www.quora.com/Whats-the-difference-between-fiat-and-cryptocurrencies">https://www.quora.com/Whats-the-difference-between-fiat-and-cryptocurrencies</a>
Google	<a href="https://www.google.co.kr">https://www.google.co.kr</a>
Naver English Dictionary	<a href="http://endic.naver.com/">http://endic.naver.com/</a>

*List of Web Pages Accessed by Taeyeon*

Title (Website)	Address
“All the Reasons Cryptocurrencies Will Never Replace Gold As Your Financial Hedge” (Forbes)	<a href="https://www.forbes.com/sites/oliviergarret/2017/10/26/all-the-reasons-cryptocurrencies-will-never-replace-gold-as-your-financial-hedge/">https://www.forbes.com/sites/oliviergarret/2017/10/26/all-the-reasons-cryptocurrencies-will-never-replace-gold-as-your-financial-hedge/</a>
“Are Cryptocurrencies Just More Fiat Money?” (HuffPost)	<a href="https://www.huffingtonpost.com/entry/are-cryptocurrencies-just-more-fiat-money_us_5a385087e4b0c12e6337b014">https://www.huffingtonpost.com/entry/are-cryptocurrencies-just-more-fiat-money_us_5a385087e4b0c12e6337b014</a>
“Comparing Currencies: Fiat, Crypto, and Virtual” (CEX.IO Blog)	<a href="https://blog.cex.io/cryptonews/comparing-currencies-fiat-crypto-and-virtual-269">https://blog.cex.io/cryptonews/comparing-currencies-fiat-crypto-and-virtual-269</a>
“Could Cryptocurrencies Replace Cash?” (Investopedia)	<a href="https://www.investopedia.com/news/could-cryptocurrencies-replace-cash-bitcoin-flipping/">https://www.investopedia.com/news/could-cryptocurrencies-replace-cash-bitcoin-flipping/</a>
“Cryptocurrency boom: A fading fad or real innovation?” (The Japan Times)	<a href="https://www.japantimes.co.jp/news/2018/02/18/business/financial-markets/cryptocurrency-boom-fading-fad-real-innovation/">https://www.japantimes.co.jp/news/2018/02/18/business/financial-markets/cryptocurrency-boom-fading-fad-real-innovation/</a>
“Fiat Currency Vs Digital Currency” (Digital Money Times)	<a href="http://digitalmoneytimes.com/fiat-currency-vs-digital-currency/">http://digitalmoneytimes.com/fiat-currency-vs-digital-currency/</a>
“No chance of cryptocurrencies replacing fiat money – JPMorgan” (RT Business News)	<a href="https://www.rt.com/business/419081-jpmorgan-cryptocurrencies-hurdle-money/">https://www.rt.com/business/419081-jpmorgan-cryptocurrencies-hurdle-money/</a>

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“The Difference Between Cryptocurrencies, Digital Currencies and Fiat Currencies” (Core Sector Communique)	<a href="http://corecommunique.com/difference-cryptocurrencies-digital-currencies-fiat-currencies/">http://corecommunique.com/difference-cryptocurrencies-digital-currencies-fiat-currencies/</a>
“The Difference Between Fiat Currency and Cryptocurrency” (Cryptocurrency Facts)	<a href="https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/">https://cryptocurrencyfacts.com/the-difference-between-fiat-currency-and-cryptocurrency/</a>
“There’s a Big Difference Between Electronic Fiat and Cryptocurrency” (Bitcoin News)	<a href="https://news.bitcoin.com/big-difference-electronic-fiat-cryptocurrency/">https://news.bitcoin.com/big-difference-electronic-fiat-cryptocurrency/</a>
“Tim Draper on Bitcoin: ‘In 5 Year If You Use Fiat Currency, They Will Laugh At You’” (Forbes)	<a href="https://www.forbes.com/sites/johnkoetsier/2017/11/07/tim-draper-on-bitcoin-in-5-years-if-you-use-fiat-currency-they-will-laugh-at-you/">https://www.forbes.com/sites/johnkoetsier/2017/11/07/tim-draper-on-bitcoin-in-5-years-if-you-use-fiat-currency-they-will-laugh-at-you/</a>
Google	<a href="https://www.google.co.kr">https://www.google.co.kr</a>

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# 국 문 초 록

한국인 대학생의 영어 온라인 조사 및 이해 책략에 대한 탐구

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최근 정보통신기술(ICT)이 문해력, 즉 글을 읽고 쓰는 능력을 급속히 바꾸어 가고 있다. 오늘날 사회에서 학생들이 필요한 정보를 찾아 적절히 활용할 수 있게끔 힘을 실어주는 외국어 교육 현장을 만들어 가기 위해서는 인터넷에서 이루어지는 읽기, 즉 ‘온라인 조사 및 이해(online research and comprehension)’에 대한 연구가 필수적이다. 그 첫 걸음으로, 본 연구는 여섯 명의 한국인 고등 영어 학습자들이 제 2 언어 온라인 조사 및 이해 과업을 수행하는 과정에서 활용한 책략을 조사했다. 이를 위해 제 2 언어 온라인 조사 및 이해를 담은 화면 녹화 자료, 자극 회상 면담을 통해 수집한 구두 자료, 그리고 기타 배경 자료를 질적으로 삼각화하여 책략 사용을 포착하고 이를 ‘구성적-반응적 독서(constructively responsive reading)’ 모형에 기반하여 분류했다. 연구 결과, 일관성 있는 읽기 경로를 구성하고 개별 디지털 텍스트 및 두 개 이상의 디지털 텍스트를 이해하기 위한 다양한 책략 사용이

성공적인 제 2 언어 온라인 조사 및 이해에 기여한다는 점이 드러났다. 이는 온라인 조사 및 이해에 전통적인 인쇄물을 읽기 위한 책략과 인터넷 환경 고유의 책략이 동시에 요구된다는 선행연구의 결론을 뒷받침한다. 또한, 이는 제 2 언어 온라인 조사 및 이해가 제 2 언어 인쇄물 읽기나 모국어 온라인 조사 및 이해와 어떻게 다른 인지과정을 요구하는지 보여준다. 본 연구는 제 2 언어 읽기의 개념이 인터넷 환경이 제시하는 새로운 과제를 포괄하도록 확장되어야 한다는 점을 시사하며, 이는 교육 현장에서 이루어지고 있는 제 2 언어 읽기 지도와 평가를 적절히 변화시켜 나갈 방법에 대한 논의의 필요성을 제기한다.

주요어: 온라인 조사 및 이해, 읽기 책략, 제 2 언어 읽기, 뉴 리터러시, 읽기 지도, 읽기 평가

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