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History, Concepts, and Characteristics of Disciplinary Literacy
: A Review of Representative Research

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I. Introduction

The most recent update of the Korean school curriculum emphasizes amalgamative thinking and problem-solving skills. As one of the targeted core abilities, the curriculum specifically suggests that teachers should aim to develop students' "creative thinking ability that creates new ones by using knowledge, skills, and experience in diverse areas of expertise based on broad basic knowledge" (Korean Ministry of Education, 2015, p. 2). It also recommends as one of the goals of high school education that students should foster the ability to solve problems creatively and cope with new situations actively by assimilating knowledge and experience in diverse fields. Kim and Lee (2016) explored the options for combining Korean language art with other content areas such as science, pointing out that there have been studies advocating such interdisciplinary integration for over a decade. They argue that the concept of disciplinary literacy is an important part of efforts to integrate Korean language art with other content areas. The concept of disciplinary literacy has also been emphasized as part of the Common Core State Standards (CCSS) in the U.S. for every discipline (Draper, 2015; Zygouris-Coe, 2012) and has thus received a great deal of attention from literacy researchers.

Although many are now studying disciplinary literacy, both in the U.S. and in Korea, there is a dearth of studies that focus specifically on it should be implemented in Korea. There are also a wide range of definitions and approaches to disciplinary literacy, even among American researchers. Given that Korean language educators are new to this field, comparing and analyzing a representative sample of the foremost disciplinary literacy researchers' perspectives can provide a useful theoretical basis to underpin future work on disciplinary literacy rather than simply juxtaposing the findings of their studies. By adopting this approach, this study describes and analyzes (a) how disciplinary literacy, which has its roots in content literacy, is emerging as a discipline in its own right, (b) how the foremost researchers in the new field define disciplinary literacy and its characteristics, and (c) which teaching points these researchers emphasize.

II. Transition to Disciplinary Literacy

The notion that every teacher is a teacher of reading has been a major educational perspective in literacy research for many years. Traditionally, *content literacy,* which is defined as "the ability to use reading and writing for the acquisition of new content in a given discipline" (McKenna & Robinson, 1990, p. 184), has played an important role in investigating and teaching multiple reading and writing strategies to maximize students' content learning across the curriculum. This has engendered a policy that includes required content literacy courses for every teacher candidate registered in a secondary education program in most U.S. universities.

However, even when *content area literacy* was the predominant theory, some teachers resisted this literacy education trend (Alvermann & Moore, 1991; O'Brien, Stewart, & Moje, 1995; Shanahan & Shanahan, 2008). Many researchers and educators were reluctant to apply this framework to their content instruction because they con-

sidered it a double burden (i.e., teaching subject content and literacy) and because many reading and writing instructional strategies are simply not applicable to specific subject instruction. Therefore, a *disciplinary literacy* framework was proposed as an alternative way to understand and examine the literacy practices of adolescents in a manner that is specific to each discipline. This section therefore describes how disciplinary literacy grew out of content literacy.

1. The emergence of content area literacy

According to Richardson (2008), in the late 1800s and early 1900s, researchers and practitioners were primarily interested in the role reading could contribute to their government and communities. Although early scholars of reading had an immense influence on all areas of reading, content area reading was not in itself a distinct discipline at that time. In the early 1900s, "reading education textbooks, articles, and applied research continued to deal with learning from text, but few innovative theories or practices emerged" (Moore, Readence, & Rickelman, 1983, p. 426).

The event that triggered popular concern about reading was the Sputnik shock. The 1957 launch of the Sputnik satellite by the Soviet Union prompted the United States to pay much greater attention to the learning of academic knowledge, especially in science and mathematics. This contributed to an emphasis on achievement in individual content areas, encouraging content area reading that was conducive to the acquisition of knowledge, but also impacting education more broadly. In this atmosphere, "content area reading instruction re-emerged in the 1970s with the cognitive revolution in psychology and with the publication of Herber's (1970) text, *Teaching Reading in Content Areas*" (Moore et al., 1983, p. 426). Herber (1970) advocated a functional reading perspective, arguing that youths would benefit from subject area teachers' assistance if a more functional approach was adopted, rather than generalized skills instruction. This text

helped launch the field of content area reading (Moje, 2007; Moore et al., 1983; Richardson, 2008). Readence, Bean, and Baldwin (1981) suggested an integrated approach that applied content area reading across disciplines, representing the next significant advance in the research on content area literacy.

2. Transition from content area literacy

Moore and his coauthors (1983) conducted a comprehensive historical analysis and made a series of recommendations for content area reading instruction. They utilized the writings of humanists, developmentalists, and scientific determinists to demarcate the field of content area reading instruction. Based on five issues, namely locus of instruction, reading demands of various subjects, study, reading materials, and age focus, they sought to clarify the "field" of content area reading instruction.

Richardson (2008) also carried out a chronological review of significant studies related to content area reading or content area literacy in various categories. According to Richardson, studies on content area reading covered a diverse array of topics. While research in the 1970s and early 1980s focused primarily on readability, as the subject matured, studies on tailored strategies and activities and examining the attitudes of teachers and students toward content area reading began to appear in the late 1980s to 1990s. In the early 2000s, research studies related to multiliteracies, or new literacies, became popular, partly due to the development of new technologies. In related research topics, a focus on *reading to learn* also gained popularity in the 1980s, and studies on background knowledge and schema theory were presented.

There was a major change and expansion of the focus in literacy research in the 1990s. Within the social context of the times and the associated broadening of research interests and concerns, researchers began to investigate the multimodal demands associated with diverse

materials such as text, symbols, graphics, and their combinations. Many researchers recognized that reading was tightly interrelated with writing and other modes of communication:

> This expansion of focus from reading to a wider range of language processes led to the use of terms such as 'content literacy' and 'literacy across the curriculum.' Literacy researchers encouraged subject-area teachers to add support for students' writing and classroom. (Chandler-Olcott, Doerr, Hinchman, & Masingila, 2015, p. 441)

This shows how the scope of literacy research scope was expanding, with research concerns shifting from content reading to content literacy, during this period.

3. Resistance to Content Area Literacy

Content area literacy was a prominent research topic in the literacy education field for secondary school contexts by the mid 2000s, but a few studies were beginning to identify some of the problems or drawbacks of content area literacy instruction. This promising new approach was simply not living up to the initial high expectations for reasons largely related to resistance to the notion that "every teacher is a teacher of reading." Researchers pointed out that content area literacy had achieved only limited success, with many content area teachers resisting incorporating reading instruction into their classes (e.g., Alvermann & Moore, 1991; Shanahan & Shanahan, 2008; Stewart & O'Brien, 1989). In early work in this area, O'Brien et al. (1995) pointed out that content area literacy instructional practices reflected the trend toward cognitively based experimental research that dominated research from the early 1970s until the late 1980s, emphasizing that the primary model used to infuse literacy into the content curriculum was met with resistance because it rested on a foundation that was constructed outside the school context in which it was being

applied. This led them to suggest that:

> content literacy educators and researchers must use the knowledge base to develop teaching methods that encourage pre- and in-service teachers to become aware of their place in the institution of the secondary school, to analyze the social and cultural constraints and possibilities with that institution, and to use content literacy strategies in ways that minimize constraints and build on possibilities. (O'Brien, et al., 1995, p. 459)

4. Change and movement toward disciplinary literacy

In addition to research focusing on the limitations of content area literacy, other voices in the field of subject areas have argued since the 1990s that learning each subject involves learning to make and utilize oral and written texts or images that use language in ways specific to that particular discipline. Utilizing ethnographic data from participatory action research and the insights from that data, Draper (2008) argued that content-area literacy instruction should promote mastery of the intellectual discourse within a particular discipline. She also suggested ways to encourage collaborations between literacy and content area specialists working in the field of teacher education.

Content area literacy educators have also been prompted to re-consider the texts to be read in the classroom, the reading purposes in their subject areas, and strategies for developing what was beginning to be called *disciplinary literacy* (Moje, 2008). This term was also used by Shanahan and Shanahan (2008), who pointed out that experts in different disciplines read their texts according to different strategies and different purposes. Although they define disciplinary literacy in different ways, advocates of disciplinary literacy agree that "Teachers should show students how to read, write, speak, think, and listen like experts or apprentices (would-be-experts) in a discipline" (Collin, 2014, p. 310).

At around the same time as the concept of disciplinary literacy

was becoming accepted, the advent of the Common Core State Standards Initiative (CCSSI) in the U.S. was leading to definite changes in literacy research and instruction. The CCSSI is designed to ensure that students make progress each year and graduate from high school prepared to succeed in college, career, and life. The CCSSI arguably pushes literacy educators and secondary schools to pay attention to disciplinary literacy (Shanahan & Shanahan, 2014). Because "general strategies are insufficient for coping with the demands of new educational standards" (Zygouris-Coe, 2012, p. 37), many researchers were encouraged to conduct studies related to disciplinary literacy, including investigating controversial topics such as the differences between content area literacy and disciplinary literacy (e.g., Brozo, Moorman, Meyer, & Stewart, 2013; Gillis, 2014; Heller, 2010; Moje, 2010), the characteristics of disciplinary literacy and its instruction (e.g., Fang & Coatoam, 2013; Shanahan & Shanahan, 2008, 2014), and disciplinary literacy from sociocultural perspective (e.g., Moje, 2007, 2015), along with experimental studies on each subject (e.g., Baron, 2016; Larson, 2014) and reviews or syntheses of disciplinary literacy (e.g., Hillman, 2014; O'Brien & Ortmann, 2016).

As seen above, the concept of disciplinary literacy appeared after a prolonged period of discussion. Above all, it is notable that content area teachers recognized the need for discipline-specific literacy strategies and skills. However, in Korea, many content area teachers still tend to regard teaching literacy skills as only Korean language arts teachers' role. In this way, content area teachers need to determine whether their subject area requires domain-specific literacy skills and how they can support students by considering those strategies or skills.

III. Definitions and Characteristics of Disciplinary Literacy

The content-area literacy/disciplinary literacy divide has generated a heated debate among literacy researchers and educators. Moje (2008) argued that we need to move away from generic, content-area teaching strategies, focusing instead on developing disciplinary literacy, which involves the specific discipline-based thinking strategies and language skills used in different fields of study or "disciplines". In contrast, Heller (2010) argued that subject area teachers in middle and high schools are not well-equipped to teach this perspective, and that disciplinary literacy should therefore be left to the college level, where students focus more on becoming disciplinary experts. Later, Brozo and his colleagues suggested that it was important to "avoid creating what might be a false dichotomy and instead [to] consider how a blend of practices from both approaches can serve the needs of all students" (2013, p. 354).

This debate revolves around the question of what the ultimate goal is in educating adolescents in terms of their literacy practices. There is considerable conceptual abstractness and inconsistency in perspectives on disciplinary literacy. For example, when Moje responded to Heller's critique on her earlier article (Moje, 2008), she pointed out that the notion of disciplinary literacy might have been misunderstood by saying, "[disciplinary literacy] instruction is decidedly not about producing disciplinary experts or about trying to push the college curriculum down to high school (another concern that he appears to have about disciplinary literacy)" (Moje, 2010, p. 276). Gillis (2014) demonstrates yet another conceptualization of disciplinary literacy in her criticism of others in the field for what she described as a misunderstood notion of disciplinary literacy that reduced the argument to general literacy strategies versus discipline specific strategies.

Although there remains some debate about the concept of dis-

ciplinary literacy, a number of scholars have attempted to define the term (Table 1). These scholars went on to describe the characteristics they considered should be included in disciplinary literacy (Table 2). Only a limited number of studies on disciplinary literacy have been conducted since the 2008 disciplinary literacy issue of the *Harvard Educational Review*; representative papers written by the researchers who have suggested definitions of disciplinary literacy are reviewed and discussed in the remainder of this paper. Understanding these scholars' definitions is especially important, as most current studies on disciplinary literacy tend to rely on this earlier research for their theoretical background (Jang & Lee, 2017).

Table 1. Definition of disciplinary literacy

Scholar	Definition and its source
Roni Jo Draper	• The ability to negotiate (e.g., read, view, listen, taste, smell, critique) and create (e.g., write, produce, sing, act, speak) texts in discipline-appropriate ways or in ways that other members of a discipline (e.g., mathematicians, historians, artists) would recognize as "correct" or "viable." (Draper & Siebert, 2010, p. 30) • Facility with all the texts used to make sense and participate in the disciplines (e.g., traditional print, images, gestures, diagrams, models, etc.) (Draper, 2015, p. 58)
Zhihui Fang	• The ability to engage in social, semiotic, and cognitive practices consistent with those of content experts (Fang, 2012, p. 19)
Timothy Shanahan and Cynthia Shanahan	• Literacy skills specialized to history, science, mathematics, literature, or other subject matter (Shanahan & Shanahan, 2008, p. 44) • The idea that we should teach the specialized ways of reading, understanding, and thinking used in each academic discipline, such as science, history, or literature (Shanahan & Shanahan, 2014, p. 636)
Elizabeth B. Moje	• The specialized literacy practices of a given disciplinary domain, such as mathematics or history or visual art (Moje, 2015, p. 256)
Daniel Siebert et al.	• A discipline-appropriate way of reading (i.e., interpreting) and writing (i.e., creating) a particular type of text (Siebert et al., 2016, p. 28)

According to Jang and Lee (2017), most empirical studies on disciplinary literacy are built on research conducted by Roni Jo Draper,

Zhihui Fang, Elizabeth Birr Moje, Timothy Shanahan and Cynthia Shanahan, hence the focus on their work here. Although most of these scholars provide definitions of disciplinary literacy that include both literacy (literacy practice or literacy skills) and discipline (or disciplinary domain), as the information provided in Table 1 demonstrates, they all provide slightly different definitions. They also make use of different terms in their definitions and have generally different perspectives on the aims of disciplinary literacy, as shown in Table 2.

Table 2. The aims or purposes of disciplinary literacy

Scholar	The aims or purposes of disciplinary literacy
Roni Jo Draper	• My approach to literacy instruction is shaped by my views of disciplinary participation and literacy. I contend that the purpose of literacy instruction for content-area classrooms is to prepare students with all the cognitive and social knowledge and skills necessary to participate fully in disciplinary activities. (Draper, 2015, p. 58)
Zhihui Fang	• The development of students' "ability to engage in social, semiotic, and cognitive practices" consistent with those used by content experts. (Fang & Coatoam, 2013, p. 628)
Timothy Shanahan and Cynthia Shanahan	• The aim of disciplinary literacy is to identify all such reading- and writing-relevant distinctions among the disciplines and to find ways of teaching students to negotiate successfully these literacy aspects of the disciplines. (Shanahan & Shanahan, 2012, p. 11)
Elizabeth B. Moje	• Disciplinary literacy is about providing learners with the opportunity to engage in the kinds of knowledge production and representation, on a limited scale. (Moje, 2010, p. 275) • Providing all students with the opportunity to understand how disciplines work and to raise questions about the trustworthiness of disciplinary knowledge. (Moje, 2015, p. 259)

Although Draper and Siebert (2010) defined the term disciplinary literacy as "the ability to negotiate and create discipline-appropriate ways or in ways that other members of a discipline would recognize as 'correct' or 'viable.'" (p. 30), they clearly intended this definition to encompass *literacy*, writ large. However, people tend to assume that the definition refers primarily to disciplinary literacy because the ar-

ticle concerned was about (re)imagining content area literacy, which in effectively disciplinary literacy. Fortunately, in a later paper on this topic, Draper and Wimmer (2015) specifically state that the definition is indeed about disciplinary literacy.

According to Draper (2008), each discipline contains both intellectual and individual discourses, and content-area instruction should thus promote mastery of both these discourses. She maintained that (re)imagining content-area literacy is necessary because this is the best way to truly "prepare adolescents to negotiate and create texts central to the disciplines and enable them to address the problems they confront in their roles as citizens of various communities" (Draper, Broomhead, Jensen, & Siebert, 2010, pp. 3-4). With regard to the term discipline, which she utilized for her definition of disciplinary literacy, this suggests that she views disciplines as communities of practice and social practice, recognizing that those carrying out various roles in society, such as artists, mathematicians, scientists, engineers, or historians, must create and use objects to mediate their interactions (Draper, 2015). She contends that literacy for the disciplines goes beyond merely conveying information and includes perspective-taking and scaffolding action (Draper, 2015). Her publications show how her thinking on disciplinary literacy or disciplines has developed over time; in one of her recent papers she clearly views a discipline as a social practice (Draper, 2015), while in a previous study the concept was never mentioned (Draper et al., 2010).

Similarly, the definition and aims that Fang (2012) and Fang and Coatoam (2013) suggest also seem to deal with disciplinary literacy from a broader perspective, especially in their use of the term 'social'. They assert that school subjects are actually disciplinary discourses that have been recontextualized for educational purposes (Fang & Coatoam, 2013), arguing that "disciplines differ not only in content but also in the ways this content is produced, communicated, and critiqued" (Fang, 2012, p. 20). Although Fang and Coatoam (2013) have stated that students are expected to use practices to engage in

socialization, Fang's main focus seems to be on the semiotic aspects of each discipline, arguing that disciplinary discourses are constructed utilizing distinct language patterns that enable content experts to conduct their work more effectively, so recognizing these discipline-specific language usages can help students learn about how different disciplines organize knowledge, thus enabling students to utilize literacy skills in the disciplines. In particular, his insistence that "the difficulties of disciplinary texts lie not just in words, but more broadly in the discourse grammar, or language patterns" (Fang, 2012, p. 31) indicates the importance he places on a functional focus on language.

Shanahan and Shanahan take a similar perspective to other scholars in that although they focus on literacy aspects of each discipline and interactions within the discipline, they generally tend to consider more explicit aspects of reading and writing. Siebert et al. (2016) agree, emphasizing discipline-appropriate ways of reading and writing in their work. In particular, Shanahan and Shanahan tend to emphasize the specialized knowledge and abilities possessed by experts and the unique tools that those experts use in their discipline (Shanahan & Shanahan, 2008, 2012; Shanahan, Shanahan, & Misischia, 2011), looking at the unique properties of individual disciplines and presenting evidence from expert-novice comparison studies and analyses of texts (Shanahan & Shanahan, 2012) as well as examining differences in the reading behaviors of six experts from different disciplines (Shanahan et al., 2011). Interestingly, their perspective changes significantly in their later work, where their emphasis shifts away from literacy skills. In Shanahan and Shanahan (2014), they consider disciplines as cultures of practice and recognize that each discipline has its own norm for how knowledge should be created, shared, and evaluated, taking their examples from the differences among history, science, and literature.

Compared to the other scholars mentioned above, Moje (2007, 2008, 2010, 2015) takes a broader perspective in discussing disciplinary literacy. Although it is difficult to grasp her perspective for dis-

ciplinary literacy from her definition alone (2015), she attempts to explore disciplinary literacy from a socio-cultural perspective, emphasizing that teaching in disciplinary literacy aims to develop not only disciplinary learning but also civic participation and social justice, arguing that teaching supports the development of new kinds of knowledge (Moje, 2007, 2015). According to her perspective, "disciplinary literacy theory and research suggest possibilities for the development of rigorous subject matter knowledge" (Moje, 2007, p. 33), and this subject-matter knowledge, being produced and analyzed in multiple forms, will eventually benefit society (Moje, 2007). In particular, she argues that since disciplinary knowledge is (re)produced and communicated in everyday practice from each discipline, young people should have access to the practice, and this will give them the power to read and become critical readers and thinkers (Moje, 2007). She explains her perspective on disciplinary literacy as follows:

> Equally important to my conception of disciplinary literacy is the recognition that the disciplines are cultures in which certain kinds of text are read and written for certain purposes and with or to certain audiences. As a result, the texts read or written in a given disciplinary culture demand particular kinds of literacy practice relevant to the needs, goals, and conventions of those purpose and audiences. (Moje, 2015, pp. 257-258)

By linking disciplinary literacy to practices and discourses in individual disciplines and showing how this relates to the culture and to the power and identity formed through interactions with each discipline, Moje (2007, 2008, 2015) expands the disciplinary literacy perspective.

Although there are some discrepancies among scholars as to the definitions and characteristics of disciplinary literacy, researchers agree that there are disciplinary literacy abilities or practices in each discipline. As argued, researchers have defined disciplinary lit-

eracy through different lenses: socio-cognitive, social and functional linguistic, and socio-cultural perspectives, rather than from a common theoretical base. However, most researchers seem not to discuss deeply what discipline is. Because the disciplinary literacy approach assumes that each discipline requires its own discipline-specific literacy, it is necessary to clarify how each discipline can be defined. For example, social studies consist of several sub-content areas such as history and global politics, thus researchers need to discuss what discipline means in the disciplinary literacy approach.

IV. Disciplinary Literacy in the Classroom

Just as each scholar has their own definition and perspective for disciplinary literacy, the scholars mentioned above may adopt similar or different teaching perspectives from each other.

Draper tends to emphasize collaborations between content-area teachers and literacy educators (or literacy specialists) in teaching using the disciplinary literacy approach (Draper, 2008; Draper & Siebert, 2010; Draper & Wimmer, 2015). According to Draper et al. (2010), students should develop the ability to read and write specialized materials if they are to participate fully in disciplinary activities and practices. However, students do not usually enter content-area classrooms knowing how to read and write the specialized print and nonprint texts of the various disciplines, so teachers must provide them with appropriate literacy instruction. Since content-area educators often lack literacy skills and literacy educators tend to lack content-area knowledge, collaborations between them are essential. Draper and Wimmer (2015) emphasized the importance of teacher educators in improving the quality of teachers and content-area classrooms. They contended that as teachers must be acquainted with disciplinary texts and disciplinary literacies, teacher education, including teacher education courses, must be improved to better prepare teachers to create

high quality content-area classrooms.

Close collaborations between literacy teachers and subject area teachers are important. Because literacy teacher candidates do not receive training for individual subject areas, and subject area teachers are not adequately prepared to teach disciplinary literacy, such collaborations offer a potential way to bridge this gap (Fang, 2014; Fang & Coatoam, 2013). Fang argued that there is a "need for literacy teacher educators to collaborate with content area teacher educators and to restructure their content area literacy course" (2014, p. 444). Fang and Coatoam (2013) pointed out that there is the potential for issues to arise with such partnerships, however, because literacy teachers can be regarded as helpers who are sent in to classrooms merely to assist subject area teachers, which can lead them to becoming marginalized. In the same vein, Creese (2010) contended that the status of English teachers as additional language teachers will decline and the role will be marginalized in the mainstream unless they are seen as also possessing sufficient skills as subject teachers. The way literacy teachers position themselves or are positioned in disciplinary literacy classrooms will have important implications.

Fang (2012) and Fang and Schleppegrell (2010) suggested a more concrete approach for the teaching of disciplinary literacy, arguing that a functional focus on language can provide a fresh perspective for teaching and learning. Fang and Schleppegrell defined functional language analysis as "an approach to secondary content area reading grounded in systemic functional linguistics" (2008, p. 591), adopting the approach of systemic functional linguistics proposed by Halliday (1994):

> SFL is a social semiotic theory that sees language as a resource for making meaning in context, where the language choices reflect and enact the context and the context predicts or suggests the language that will be used. Speakers and writers make (typically unconscious) choices from the various options that language makes available, according to the so-

> cial and cultural contexts in which meaning is exchanged. As an interlocking set of grammatical systems, language enables its users to make different kinds of meaning for different purposes and contexts. Thus, variations in language patterns express the diversity of structures and processes in the social system. (Fang & Schleppegrell, 2008, p. 591)

At the secondary school level, as educational knowledge become specialized and difficult, and language structure also becomes complex, functional language analysis enables students to understand how meaning is presented in each discipline, and teachers can help their students learn the specialized patterns in disciplinary texts (Fang & Schleppegrell, 2010). Thus, by offering "teachers practical tools for engaging students in systematically analyzing the language patterns and discussing the meaning of these patterns in disciplinary texts" (Fang, 2012, p. 32), teachers can enable their students to generate, communicate, evaluate, and renovate disciplinary knowledge.

Shanahan and Shanahan (2008) accessed disciplinary literacy teaching from a somewhat different perspective than Moje by classifying literacy development in terms of three phases, namely basic literacy, intermediate literacy, and disciplinary literacy. These phases are similar to the classification system proposed by Fang (2012) in that both Shanahan and Shanahan (2008) and Fang (2012) regard disciplinary literacy as the highest phase of literacy development.

Shanahan and Shanahan (2008) and Shanahan et al. (2011) placed their main focus on the differences between disciplinary experts, such as historians, scientists, and subject area teachers, and novices such as students, revealing that disciplinary experts and subject area teachers employ different literacy skills and strategies from each other, and their levels of use are also different from one another. Based on these differences, they argued that the purpose of disciplinary literacy teaching is to allow students to acquire disciplinary skills and knowledge akin to that of the experts, and that to achieve this end the teaching process requires a close collaboration with literacy experts.

In particular, Shanahan and Shanahan (2014) argued that disciplinary literacy teaching not only can be but also should be applied in elementary schools. They advocated that in order for students to learn knowledge via the disciplinary literacy approach, elementary school students can be taught using texts of multiple types, acquiring discipline-specific vocabulary from both stories and social studies, science, or even mathematics texts.

Moje (2007) reviewed disciplinary literacy pedagogy using a categorized perspective, viewing the pedagogy as teaching cognitive literacy processes, the epistemological processes and linguistic processes of each discipline, and helping students learn to navigate across cultural boundaries. She also recognized that preservice and inservice teachers tend to be skeptical about the efficacy of the teaching and learning strategies offered by content area literacy researchers and their application to their subject area classrooms, noting that "teachers hold cultural beliefs about the appropriate practices of their respective disciplines," (Moje, 2008, p. 98). She noted that many schools still experience arguments about the roles and the scope that subject area teachers, such as social studies, science, and mathematics, and literacy teachers, such as English language arts teachers, take on.

Moje advocates the importance of disciplinary literacy teaching in that knowledge in the disciplines is produced or constructed as a result of human interactions and society needs this disciplinary knowledge (Moje, 2007, 2008), although she also recognized that each discipline is not only a discourse but also a culture (Moje, 2015). Regarding teachers' roles from this perspective, she asserted that subject area teachers should provide students with opportunities to examine the discourse in relation to the practice and discourses of everyday life; pointed out that teachers can employ multiple diverse genres, text types and new media materials to build knowledge and help their students engage with the disciplines; and recommended that teachers should also provide opportunities for students to hone their metadiscursive skills, which are not only useful for engaging in many differ-

ent discourse communities but also for knowing how and why they are engaging in terms of social positioning and power relationships (Moje, 2008). In the classroom, Moje (2015) suggested applying the four "Es" listed in Table 3 when teaching disciplinary literacy, asserting that these elements represent aspects of good literacy teaching.

Table 3. The four Es and their meaning (Moje, 2015)

4Es	Meaning
Engage	To remind teachers to engage the practices of the discipline under study
Elicit/Engineer	To help the teacher remember that adolescents are not experts and that their engagement in disciplinary practices needs to be engineered
Examine	To serve as a prompt for getting students to examine closely words and ways with words
Evaluate	To take up the navigational work of disciplinary literacy teaching and encourage metadiscursive practices by asking students to evaluate when, why, and how disciplinary language is and is not useful

Of course, Moje (2008) was very aware of the problems that teachers who pursue disciplinary literacy teaching can encounter in real world classrooms. Teachers need to consider their students' disciplinary background knowledge and literacy skills and recognize the gaps between students' academic levels. Learning motivation, which leads students to engage in each discipline by adopting an appropriate identity as a historian, scientist, and so forth, is also a crucial factor for students. Moreover, teachers benefit greatly from a supportive school structure and opportunities to work across disciplines and plan for inquiry units through the dimensions of the heuristic (Moje, 2008, 2015). Although there are inevitably limitations or difficulties for disciplinary literacy teaching, she maintained that "disciplinary literacy teaching can be considered a form of socially just teaching" (Moje, 2015, p. 259) that equips students to become active participants in a democratic society (Moje, 2008).

Overall, researchers agree that content area teachers better sup-

port student comprehension and engagement by integrating disciplinary literacy into their practice. However, which perspective is more effective in which discipline should be discussed. Researchers also need to explore whether and how the disciplinary literacy approach can be applied to elementary school classes. Disciplinary literacy researchers (e.g., Shanahan & Shanahan, 2014) argue that elementary school classes need disciplinary literacy as well, but there is little research on this subject. Above all, at the elementary school level, one teacher deals with all of the disciplines, so researchers should investigate whether and how elementary school teachers indeed use and teach different literacy strategies in their classes.

V. Conclusion

This recapitulative review of the research flowing from content-area literacy research to disciplinary literacy research highlights the necessity and importance of disciplinary literacy research. The summaries provided herein to describe the various perspectives of leading scholars in the field regarding the definitions, characteristics and teaching of disciplinary literacy show how their perspectives share many important features but also how they differ from each other. From this review, we can raise some discussion and implications for education in Korea.

First, researchers in Korea need to discuss how disciplinary literacy, content area literacy, and academic literacy can be translated into Korean. Some researchers use a different concept to indicate the content area literacy. The translation for the concepts of disciplinary literacy and academic literacy is also problematic. Academic literacy tends to be used as a broad concept including writing across curriculum, academic language, multiliteracies, and disciplinary literacy. However, when we translate academic literacy and disciplinary literacy, both concepts may be translated into the same word. Thus, it

is important to discuss how to translate those concepts into Korean to reveal the characteristics of each concept more explicitly.

Second, fundamentally, educators need to discuss whether the disciplinary literacy approach can be indeed applied to Korean educational contexts. The CCSS in the US made researchers and educators recognize the importance of disciplinary literacy, but the curriculum in Korea does not seem to emphasize the disciplinary literacy approach. Although the disciplinary literacy approach itself is reasonable, educators need to discuss whether our educational contexts require the approach. In particular, content area teachers in Korea still think that they just need to teach only content rather than teaching domain-specific literacy skills in their disciplines. This issue can also be related to the role of Korean language arts teachers. Specifically, some can argue how much Korean language arts teachers need to intervene in content area teachers' teaching practices.

Third, we need to discuss how literacy professionals can collaborate with content area educators or teachers. Many researchers, including those whose work has been described here (e.g., Draper, 2008; Draper & Siebert, 2010; Draper, Broomhead, Jensen, & Nokes, 2012; Fang & Coatoam, 2013; Moje, 2010, 2015; Shanahan & Shanahan, 2008, 2011; Siebert et al., 2016; Wilder & Herro, 2016), emphasize the importance of close collaborations among disciplinary experts, teacher educators, and teachers as they work together to identify the best ways to teach their students and engage them in each discipline (content area). Researchers share similar perspectives in some ways, pointing out that each discipline requires special literacy skills, strategies, and practices. However, there are also significant differences in perspectives amongst them regarding the optimum analysis, teaching and learning methods to support the development of disciplinary literacy. Although this study was unable to address the specific differences revealed in the many empirical studies that have been reported due to space limitations, these will be explored in a future study.

Fourth, the emphasis on the disciplinary literacy approach re-

quires changes of teacher training curriculum in universities. Many universities in the US already include literacy-related courses for content area teachers, but the universities in Korea still focus only on content itself in disciplines. Thus, many content area teachers are not prepared to teach discipline-specific literacy strategies and skills. This necessity of teaching discipline-specific literacy strategies is also related to other issues. For example, we need to explore how the courses in the universities can be designed. Above all, the collaboration between content area teacher educators and literacy teacher educators will be required. That is, the courses should be interdisciplinary but there may be resistance against that kind of collaboration because some researchers worry that collaboration with other fields can weaken their own fields.

A forthcoming paper by Hinchman and O'Brien (in press) will suggest a new approach to disciplinary literacy, namely the use of third-space pedagogy, where students and teachers are invited to engage in inquiry together by merging their perspectives into new, hybrid viewpoints as they work. This approach is being proposed to address an important limitation of the existing infusion approach, and thus has significant implications for disciplinary literacy and overall literacy education. Hopefully, this study will attract teachers' and researchers' attention to the topic of disciplinary literacy and encourage them to engage in in-depth discussions on whether disciplinary literacy does indeed have a place in their classrooms and, if so, how educators can best support their students' disciplinary literacy skills.

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ABSTRACT

History, Concepts, and Characteristics of Disciplinary Literacy

: A Review of Representative Research

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Disciplinary literacy, which is a very active area of research in the U.S., is little known in Korea. Given that Korean language educators are only now starting to study disciplinary literacy, comparing and analyzing the different perspectives of leading disciplinary literacy researchers in the field will provide a useful theoretical foundation for future studies of disciplinary literacy in the Korean context. By providing this perspective, this study describes and analyzes (a) how disciplinary literacy grew out of content area literacy, (b) how representative disciplinary literacy researchers define disciplinary literacy and its characteristics, and (c) which teaching points these researchers emphasize.

This review of the perspectives, definitions, characteristics and teaching proposed by representative disciplinary literacy scholars reveals where their perspectives are similar to each other and where they differ. All agree that each discipline requires special literacy skills, strategies, and practices and most also emphasize the need for disciplinary experts, teacher educators, and teachers to work together to teach and engage their students in each discipline (content area). From this review, some issues are raised: how discipline should be defined, how the disciplinary literacy approach can be taught in universities in Korea, whether the approach should be applied to the elementary school level, and how content area professionals and literacy professionals should collaborate with each other.

KEYWORDS Disciplinary Literacy, Content Area Literacy