교육학박사학위논문

Korean Engineering Graduate Students' Genre Knowledge Construction of English Research Articles Through Genre Pedagogy

장르 교수를 통한 한국 공대 대학원생들의

영어 학술 논문 장르 지식 구축에 대한 탐구

2022년 8월

서울대학교 대학원

외국어교육과 영어전공

김재민

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by

Janet Jaymin Kim

A Dissertation Submitted to
the Department of Foreign Language Education
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in English Language Education

At the
Graduate School of Seoul National University

August 2022

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지도교수 오선영

이 논문을 교육학 박사 학위 논문으로 제출함

2022년 8월

서울대학교 대학원

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김재민의 박사학위논문을 인준함

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ABSTRACT

Korean Engineering Graduate Students' Genre Knowledge Construction of English Research Articles Through Genre Pedagogy

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Research articles (RAs) have increasingly gained significance as a high-stakes genre in the publish or perish culture of academia. Publishing one's work at a high-impact journal is a daunting task for any writer, but the publication pressure only multiplies to novice writers using English as a Foreign Language (EFL). Writing RAs poses a double jeopardy for them as they are not only required to meet the expectations of advanced English writing skills but also writing conventions specific to their discourse communities.

Meeting the learners' needs, genre pedagogy has been of particular interest in English for Specific Purposes (ESP) as an effective practice of teaching by assisting learners to promptly learn the linguistic, organizational features of the target genre required in their professions. Following a body of research on the efficacy of genre pedagogy, recent genre studies in ESP have shed light on learners' genre learning and emphasized the significance of developing learners' genre awareness along with language-specific knowledge. In raising learners' genre awareness, genre analysis has been advocated as not only an instructional but also learning tool.

Most genre teaching and learning studies to date have been centered around ESL learners or advanced EFL learners in soft sciences, who are arguably in a better position to conduct genre analysis, often requiring advanced linguistic skills. The limited number of genre studies on EFL learners are also confined to case studies of a small number of genre users, often scanting learners' comprehensive views of the given genre pedagogy or their attested performance of the noticed genre features.

In an attempt to better explore the feasibility of genre analysis for learners underrepresented in genre studies and their learning trajectories, this dissertation illuminates engineering graduate students' genre knowledge development and perception of genre pedagogy in a Korean EFL setting. In a 15-week RA writing course adopting genre pedagogy, 36 engineering graduate students engaged in various genre-related tasks, namely model paper analysis, group discussion, self-annotated writing, followed by revision based on teacher feedback. During the course, students shared their experience with the genre pedagogy in semi-structured interviews and final survey questionnaires. The naturalist data collected were analyzed by qualitative mixed methods (Brown & Coombe, 2015) to diversify the methodological scope in genre studies, where case studies are plenteous. In reference to the descriptive and inferential statistics of the Likert scale final survey questionnaires, the rest of the qualitative data were analyzed by the constant-comparative method (Strauss & Corbin, 1998) until a number of common themes emerged. The qualitative data subject to analysis include the open-ended responses from the final survey, student interviews, their reflection notes, model paper analysis reports, and self-annotations on their drafts.

The crystallization of multiple student artifacts revealed that the majority of students showed heightened understanding of genre knowledge by intersecting multiple domains of genre knowledge; not all of them succeeded in performing the noticed genre features. The most dominant theme overarching the collective data was the integration of formal knowledge and rhetorical knowledge. In particular, the rhetorical function of the move structure and its variation across specific fields with the communicative functions of lexicogrammar were prominently discussed in students' model analysis reports and self-annotations in their own writing.

The final survey results show that the most well-received components of the genre pedagogy were students' self-annotated writing and teacher feedback while learners struggled with model paper analysis and group discussion, which were designed as the main genre analysis tasks. Students generally attributed their improvement of understanding and applying the move structure as well as lexicogrammar required in RAs to the more conventional writing class elements, self-annotated writing and teacher feedback. This self-perceived improvement was manifested in one third of the students' written products. The qualitative text analysis of student drafts revealed that those who checked all of the provided teacher feedback, engaged with self-annotations and model paper analysis in depth, and had imminent plans for publication often showed more change in the move level and more correct, effective use of citations and appropriate register.

Overall, learners displayed particular engagement with formal knowledge, targeting lexicogrammatical features when it came to annotating and revising their writing. In their final reflection notes, the majority of learners echoed that

lexicogrammar, along with the move structure, was the area where they made most improvement with the pedagogy but also where they wish to make further improvement in the future.

Based on the noted intersection between learners' development of genre knowledge and their perception of the genre pedagogy, this study expounds on the nature of formal and rhetorical genre knowledge domains and discusses the significance of developing genre users' formal knowledge for bridging the gap between noticing and performing genre knowledge. The study lastly shares pedagogical implications of developing a practical, localized genre pedagogy corresponding to the immediate writing needs of EAP learners who require more language support in an EFL learning context.

Keywords: English for Academic Purposes (EAP), genre knowledge, research article (RA), Korean engineering graduate writers, genre-based writing, move analysis, qualitative mixed methods

Student Number: 2016-35730

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CHAPTER 1. INTRODUCTION

The present study explores how Korean engineering graduate students build their genre knowledge of research articles in genre pedagogy and reports their pains and gains. This chapter introduces the background, purpose, and significance of the present study. Section 1.1 sets forth the background of exploring the development of engineering graduate students' genre knowledge of research articles in a Korean EFL context. Section 1.2 elucidates the purpose of the study and addresses the significance of investigating genre knowledge development of the cohort. Finally, Section 1.3 outlines the organization of the dissertation.

1.1. Background of the Study

Publishing research articles (RAs) in international journals is an indispensable yet daunting task for any scholar in an ever competitive academia. In a publish-perish culture, publication is the way "knowledge is constructed, academics are evaluated, universities are funded, and careers are built, and each year its influence becomes ever more intrusive and demanding" (Hyland, 2016, p. 58). Given that the medium of language in high profile international journals is dominantly English (Hyland, 2016), researchers whose English is an additional language are naturally pressured to publish their RAs in English (Curry & Lillis, 2017).

Aside from research capability, publishing RAs in English certainly takes more than just good English writing skills; performing the genre fundamentally requires proper understanding of the writing conventions in the genre conforming to disciplinary expectations at the discourse level (Basturkmen, 2009). Genre-appropriate writing can be produced when writers have proper genre knowledge in both the sentence and discourse levels.

As challenging as it could be for anyone to publish their work in a high profile journal, novice writers using English as a Foreign Language (EFL), in particular, are placed in double jeopardy due to the demands of meeting expectations in the discourse level on top of the sentence level writing in an additional language. Moreover, the pressure of publication has extended to many graduate students as part of their graduation requirements not only in the inner circle of English-speaking countries but also in increasingly many Asian countries (Cho, 2009; Huang, 2010; Kwan, 2010; Li, 2007).

Moreover, publishing RAs means inevitable responsibility to Korean engineering graduate students, in particular, because they often work for their supervisors on big-scale projects funded by the government or national institutes under "the pressure of research performance and funding," on top of their individual research (Lim, 2018, p.170). Under such stressful circumstances, it is indispensable to learn about the target genre features and practice writing in English with maximum efficiency of time and resources.

In fact, the needs of Korean engineering graduate students have been surveyed and the previous needs analysis studies commonly report their difficulty with English

language skills when it comes to writing RAs (Cho, 2009; N. Kim, 2020; Shin, 2015). While the most important feature of RAs was perceived to be meta-linguistic features, namely overall paper organization and paragraph development, the most problematic areas in writing English RAs for this cohort have been reported to be basic sentence writing skills, in particular sentence structure, grammar, and vocabulary (Cho, 2009). More recent studies also echo that Korean engineering graduate students find it difficult to select and use proper vocabulary, especially writing RA manuscripts in English (N. Kim, 2020; Shin, 2015).

Limited English proficiency eventually serves as a major reason for feeling particularly burdened when it comes to writing RAs in English to graduate students of science and engineering schools in Korea (Cho, 2009). Compared to writing an RA in Korean, it usually requires more than twice the time to write one in English according to a survey on Korean engineering students (N. Kim, 2020). Consequently, EFL writers often feel at a disadvantage when writing or publishing papers in English (Cho, 2009; Huang, 2014). This overall speaks to a considerable need for English for Specific Purposes (ESP) courses in science and technology and for academic courses at the graduate level (Johns, 2003).

Among major genre schools, English for Specific Purposes (ESP) school has had the RA genre and its users at the heart of their theoretical research and pedagogical practice. Rooted in Swales's (1990) genre analysis, ESP studies have burgeoned with the move analysis of RAs and expanded to genre teaching and learning. Indeed, ESP scholarship boasts its practicality for offering pedagogical insights and materials (Swales & Feak, 2012) to learners with immediate writing needs required in their work

or study. In particular, genre-based instruction of academic literacy is regarded as "visible pedagogy" that provides an explicit comprehension of the structure of the target genre (Hyland, 2004).

More recent genre teaching and learning research has endorsed or used genre analysis as a pedagogical tool for raising learners' genre awareness of RAs (Cheng, 2008, 2015; Hyon, 2001; Kuteeva, 2013; Kuteeva & Negretti, 2016; Negretti & Kuteeva, 2011; Tardy, 2009, 2011). The empirical evidence supports the benefit of genre analysis tasks on the learner's end for developing an enhanced understanding of their disciplinary reading and writing practices (Cheng, 2008; Hyon, 2001), and metacognition necessary for recontextualization (Negretti & Kuteeva, 2011), among many.

Most of the genre pedagogy research, however, has been conducted with advanced learners in ESL contexts or soft sciences, such as advanced international students in the US (Cheng, 2015), and pre-service English teachers (Negretti & Kuteeva, 2011) or humanities majors (Kuteeva, 2013) even in an EFL context. Presumably, these learners are in a better position to conduct genre analysis themselves, which requires advanced linguistic skill sets. Given a dearth of studies with less proficient learners in hard sciences and EFL settings, feasibility of engaging learners in genre analysis should be further tested in the understudied areas. If genre analysis could assist learners' genre knowledge development and performance, the underrepresented population should be also included in reaping the benefits.

In addition to the concentration on certain populations, previous RA genre learning research has mostly taken a qualitative approach, predominantly case studies

on a small number of learners (Cheng, 2006, 2008, 2011; Huang, 2014; Negretti & Kuteeva, 2011; Tardy, 2009). The limited methodological scope of genre teaching and learning literature naturally calls for diverse methodological approaches to broaden the understanding of genre knowledge and genre teaching and learning.

To date it is rare to find genre analysis studies with Korean engineering students in an EFL learning context. Research on Korean graduate engineering students has also been limited to their perception of English or writing needs analysis (Cho, 2006, 2009; Hong & Lee, 2011; Nam, 2020; Shin, 2015) or effect of writing pedagogy based on ESP principles (Lee et al., 2014), but not exactly genre pedagogy involving students to conduct genre analysis.

1.2. Purpose and Significance of the Study

The present study aimed to explore how learners develop genre knowledge and experience genre pedagogy in a Korean EFL learning context. Diversifying methodological approaches in genre teaching and learning studies, this study adopted a qualitative mixed method (Brown & Coombe, 2015). Both qualitative and quantitative measures were considered reasonable to delineate learners' genre knowledge development process and their perception of the given genre pedagogy. The qualitative perspective attempted to describe learners' genre developmental aspects reflected in their genre analysis tasks, relevant change in their written products, and their personal first-hand experience of genre pedagogy shared in interviews and reflection notes. The quantitative analysis of the students' final survey responses on Likert scale were aimed

to provide their general perception of the genre pedagogy, illuminating the most developed genre knowledge and well-received class elements that may further the integration of genre knowledge.

The purpose of the study was to add to the genre pedagogy literature the voice and experience of relatively overlooked EFL engineering students with their specific genre learning needs based on the delineation of their genre knowledge development aspects. By doing so, this study attempted to contribute to shedding more light on learner-focused studies in genre pedagogy, connecting understudied learners' needs, genre learning process, and performing the genre. It is hoped that sharing the pains and gains of Korean engineering graduate students with their genre pedagogy experience could provide insights into a more effective genre teaching and learning for genre users with diverse learning and linguistics backgrounds. By illuminating the learning trajectories and experience of Korean EFL writers in the understudied hard sciences in their first genre pedagogy, the present study finds its significance in prompting more learner-oriented research in pursuit of practical pedagogy suitable for target learners.

1.3. Research Questions

In an attempt to extend the literature of learner-focused genre studies, the current study explores how Korean engineering graduate students develop their with genre pedagogy, where they analyze genre exemplars and their own writing of RAs. It is envisaged that the learners' shared experience and learning trajectories in the genre

pedagogy will shed more light on the underrepresented learners' learning needs in the scholarship of genre learning and teaching. To this end, the current exploratory study seeks to address the following research questions:

1. How do Korean engineering graduate students in an EFL setting develop and perform their genre knowledge in a 15-week research articles writing course based on genre pedagogy?
2. How do the students perceive the given genre pedagogy? To what extent do they perceive that their genre knowledge is developed and writing skills improved by the end of the course?

1.4. Organization of the Dissertation

This dissertation is organized in the following order. Chapter 1 introduces the background, purpose, significance of the study. Chapter 2 reviews previous literature in genre studies, focusing on the theoretical discussion on the conceptualization of genre knowledge and practice of genre pedagogy in ESP. Chapter 3 delineates the study context and the methodology adopted. Chapters 4 and 5 present the findings of the study, reporting the study participants' learning outcomes and their own voices sharing experience with genre pedagogy. Chapter 6 discusses the significance of the genre knowledge learning aspects shown in previous two chapters. Finally, Chapter 7 concludes the present study after sharing limitations of the study and pedagogical implications for future research.

CHAPTER 2. LITERATURE REVIEW

This chapter reviews previous literature that paved the way for genre studies and provided the rationale for conducting the current study. Section 2.1 overviews the definition of genre and conceptualization of genre knowledge, the theoretical framework of the present study. Section 2.2 surveys the historical debate over explicit teaching of genre among three genre schools: the Sydney School, the New Rhetoric, and English for Specific Purposes. Section 2.3 overviews the past and recent ESP genre studies, from genre-based instruction effects to genre learners' learning process and knowledge development, which sets the scene for the research questions guiding the dissertation in Section 2.4.

2.1. Conceptualization of Genre Knowledge

This section overviews the notion of genre and genre knowledge as the theoretical framework of the present study. Section 2.1.1 discusses the definition of genre and genre knowledge as the backdrop of the conceptual framework. Section 2.1.2 outlines the composition of genre knowledge as part of a language-dependent domain of genre knowledge and explicates the genre knowledge model adopted in the current study.

2.1.1. Genre and Genre Knowledge

The notion of genre has evolved with the growing attention to the significance of context in language use (Bhatia, 1993; Flowerdew, 1993; Hyland, 2004; Hyon, 1996; Paltridge, 2001; Swales, 1990; Swales & Feak, 2000, 2004). Genre is grounded in the conceptual realm called its discourse community, a group of individuals sharing a set of expectations, interactions, and language use (Swales, 1990). In this view, genre materializes in the formal and rhetorical features reflecting the norms of discourse community, determining the social appropriateness and acceptability of genre practices.

Genre is described as "communicative events" that are characterized both by their "communicative purposes" and by various patterns of "structure, style, content and intended audience" in Swales's (1990) seminal research in shaping genre theory in English for Specific Purposes (ESP) (p. 58). In other words, genre is a concept based on certain expectations shared by the members of a discourse community, a discursive space where writers, texts and readers join (Swales, 1990), with regard to recognizing the similarities in the texts; thus, genres encourage readers to look for organizational patterns or the ways that texts are rhetorically structured to achieve a social purpose (Hyland, 2002). The relations between readers and writers are compared to dancers following each other's steps by anticipating what the other is likely to do by making connections to prior steps (Hoey, 2001).

Since the evolving academic discourse on genre, many scholars have also defined what genre knowledge entails using different terminologies (Cummins, 2000; Gentil, 2011; Kobayashi & Rinnert, 2012; Tardy, 2009, 2012, Tardy et al., 2020), as reviewed in Kim and Belcher (2018). On the whole, genre knowledge can be viewed as

twofold: language-dependent knowledge and language-independent knowledge. Language-dependent knowledge is also called language specific aspects (Cummins, 2000), linguistic knowledge (Kobayashi & Rinnert, 2012), formal and rhetorical knowledge (Tardy, 2009), and genre-specific knowledge (Tardy et al., 2020). Language-independent genre knowledge is termed more variously as a common underlying proficiency (CUP) (Cummins, 2000), genre awareness or rhetorical awareness (Devitt, 2004, 2009), metaknowledge (Gentil, 2011), rhetorical features (Kobayashi & Rinnert, 2012), and subject-matter and process knowledge (Tardy, 2009). Heeding that genre knowledge is often confined to particular text forms associated with particular discourse, Berkenkotter and Huckin (1995) maintain that genre features are embodiment of the values, power, and ideologies inherent in a discourse, which constantly changes based on the cognitive and social nature of genre.

Following the prolific yet often conflicted discussion on the notion of genre knowledge, formal models of genre knowledge were developed by a few scholars (Beaufort, 2007; Tardy, 2009). The model proposed by Beaufort (2007) constructs disciplinary writing expertise, comprising genre knowledge, discourse community knowledge, writing process knowledge, subject matter knowledge, and rhetorical knowledge. Compared to Beaufort's (2007) model, Tardy's (2009) model specifically depicts genre knowledge as a multidimensional theoretical concept, constitutive of formal, rhetorical, process, and subject-matter knowledge. Tardy later adds the elements of genre awareness and metacognition, accepting Gentil's (2011) argument over the essentiality of the two in defining genre knowledge, as well as the conception of

recontextualization (Cheng, 2018) to complete a genre knowledge model encompassing multilingual genre users as well as their L1 and L2 counterparts.

2.1.2. Genre Knowledge and Genre-Specific Knowledge

Genre knowledge has been precisely illustrated by Tardy (2009) as a fluid notion intersecting with four related domains: formal, rhetorical, process, and subject-matter knowledge. In definition, formal knowledge refers to linguistic and structural features of a genre, such as "discourse or lexico-grammatical conventions of the genre, and the contents or structural moves that are common to the genre" (Tardy, 2009, p. 21). Formal knowledge, for example, comprises understanding of a genre's textual elements, such as text format, conventionalized textual rules, structural organization, and linguistic features.

Rhetorical knowledge, while related to formal knowledge, specifically refers to language use that helps writers achieve their intended purposes. Rhetorical knowledge includes an understanding of a genre's purpose in relation to a specific local context, necessitating a sophisticated understanding of readers' values and beliefs as they reach their reading goals, as well as an understanding of the situational variables that influence the writer-reader positioning in context.

Process knowledge refers to the composing process in which a genre is undertaken that assists the writer to complete the text. Process knowledge also encompasses "oral interactions that might facilitate effective reception of a genre" as well as one's understanding of how the genre is distributed to its audience and "the reading practices of the receivers of the genre" (Tardy, 2009, p. 21). As process

knowledge involves the production and reception of the genre, she extends this definition by regarding all practices in the process of writing for publication as process knowledge, including the appropriate use of intertextuality and correspondence with journal editors. In other words, process knowledge includes all the processes involved in achieving an intended rhetorical action for a task—on the part of the writer that means understanding not only task management skills, but also the reading processes of the reader. In other words, process knowledge encompasses all of the processes required in attaining a desired rhetorical action for a task—this involves knowing not only task management abilities, but also the reader's reading processes.

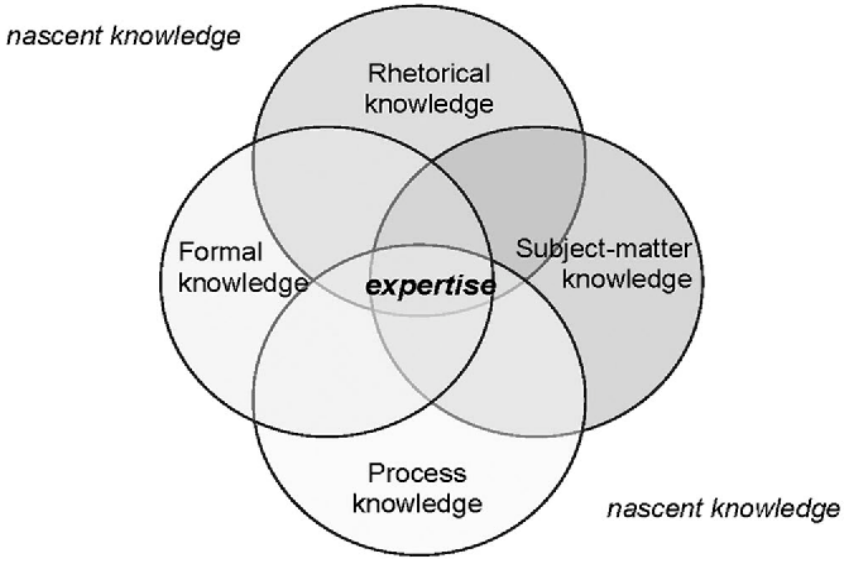
Finally, the definition of subject-matter knowledge refers to the content of a genre, that is, knowledge about disciplinary content. Subject-matter knowledge encompasses background knowledge and details of the subject matter to be fleshed out in completing a task. The decision of which content to address requires a sophisticated understanding of the discourse, and this knowledge develops in line with other knowledge dimensions of genre.

In Tardy's (2009) genre knowledge model, each genre knowledge domain overlaps in reality; her genre knowledge model is schematized for analysis purposes. Consequently, this genre knowledge model has drawn attention to a number of L2 genre learning research (Huang, 2014; Kim & Belcher, 2018; Sommer-Farias, 2020; Worden, 2018; Kessler, 2021, Kuteeva & Negretti, 2016). Although the four categories of genre knowledge are useful for analysis, they should be seen as heuristic, not be taken as clear-cut since the development of genre knowledge is regarded as the "increased integration" of the four aspects of knowledge (Tardy, 2009, p. 22). Ultimately, as

expertise in genres grows, the more layered and integrated the four domains become in her definition of genre knowledge as shown in Figure 1.

Figure 1

Genre Knowledge (Tardy, 2009, p. 22)



Tardy's (2009) genre knowledge is later renamed as genre-specific knowledge, "the knowledge that writers hold of a particular genre or group of genres" (Tardy et al., 2020, p. 294) in an attempt to operationalize the notion of genre knowledge as a broader concept encompassing genre awareness. Although renamed, Tardy's (2009) genre knowledge essentially shares the same definition with Tardy et al.'s (2020) genre-specific knowledge, which denotes "multidimensional dynamic of knowledge of several overlapping domains" (p. 294). As the four domains intersect in Tardy's (2009) genre knowledge, genre-specific knowledge is multilayered with "formal (e.g., content, organization, lexicogrammatical features), process (e.g., composing, distributing),

rhetorical (e.g., discourse community, social relations), and subject-matter knowledge (e.g., disciplinary conversations)" (Tardy et al., 2020, p. 294).

2.1.3. Genre Awareness, Metacognition, and Recontextualization

As a way of developing a comprehensive notion of genre knowledge, genre awareness has emerged as a critical conception in genre teaching. Genre awareness has been defined as "a consciousness of and process for analyzing, and learning, and critiquing any genre" (Devitt, 2015, p. 46) or "a broad understanding of rhetorical contexts and how writers may effectively respond to exigencies within such contexts" (Tardy et al., 2020, p. 296). Genre awareness also "overlaps with the rhetorical knowledge that a writer develops for a specific genre" (*ibid*, p. 296). The dynamic between genre awareness and genre knowledge is often viewed as "mutually supporting" as "neither can be achieved without the other" (Cheng, 2018, p. 47).

Scholars have advocated for a pedagogy that aims to develop genre awareness for it allows students to "seek the rhetorical nature of the genre, to understand its context and functions for its users, in order to avoid formulaic copying of a model rather than rhetorically embedded analysis of samples" (Devitt, 2004, p. 201). Genre awareness is what students apply across multiple genres, discipline-specific examples of the same genre (Cheng, 2018), and even across genres in different languages (Gentil, 2011; Sommer-Farias, 2020; Tardy et al., 2020).

Genre awareness often goes hand in hand with rhetorical flexibility (Johns, 2008), which facilitates the adaptation of genre knowledge to different contexts.

Genre awareness and rhetorical flexibility can be fostered by discovery-based rhetorical-consciousness raising tasks (Cheng, 2018) and examine-and-report-back (Swales & Feak, 2004) approaches. These propositions gave rise to diverse pedagogical practices, including "conscious attention to genres" (Devitt, 2009) through genre-analysis tasks (Cheng, 2007, 2011; Kuteeva, 2013; Kuteeva & Negretti, 2016), student reflections (Negretti & Kuteeva, 2011; Kuteeva & Negretti, 2016), students' self-annotations on their own writing (Cheng, 2007; 2018), interviews with students to gauge their developing rhetorical consciousness (Cheng, 2018), and written description of rhetorical context (Negretti & McGrath, 2018).

These studies illustrate that fostering genre awareness is important because it enables students to be aware of what features are part of that genre and for what purpose they are used in specific situations. Based on this knowledge, users might be better prepared to apply genre knowledge to other situations or, in other words, recontextualize it (Cheng, 2018).

Not only intersecting with rhetorical knowledge for one specific genre, genre awareness is also associated with metacognition according to writing scholars (Devitt, 2015; Negretti & Kuteeva, 2011). Metacognition is theoretically distinguished as metacognitive knowledge and metacognitive regulation. Metacognitive knowledge refers to our understanding of what we know about a specific, our (rhetorical) task, including awareness of ourselves as learners (or writers) and relevant concepts and strategies that may help perform this task (Negretti & McGrath, 2018). This component can further be subdivided into declarative, procedural, and conditional knowledge dimensions. In other words, they are defined as "awareness of what we know

(declarative knowledge), how to apply it (procedural) and why it is relevant to the current learning conditions (conditional)" (Negretti & McGrath, 2018, p. 15). Metacognitive regulation, in turn, refers to the various skills necessary to regulate learning and problem solving, such as planning the writing process, setting goals and strategies, and reflecting or judging writing performance.

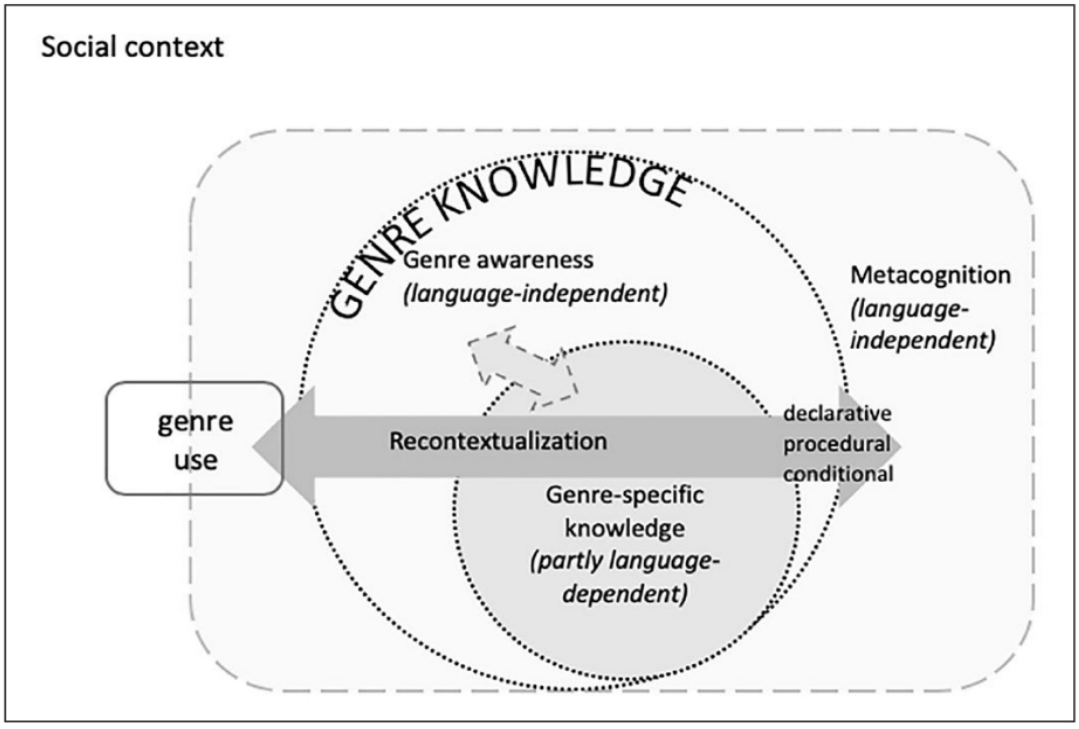
As the action through which conditional knowledge is realized, recontextualization involves "learners' abilities not only to use a certain generic feature in a new writing task, but to use it with a keen awareness of the rhetorical context that facilitates its appropriate use" (Cheng, 2007, p. 303). In Tardy et al.'s (2020) framework, recontextualization refers to "the deployment of genre knowledge in new genre uses, engaging a writer's genre-specific knowledge and—to varying degrees—genre awareness" (p. 301). What is important to note is that recontextualization does not necessarily assume successful genre use as it is the process or action through which conditional knowledge is utilized, engaging genre-specific knowledge and genre awareness. In genre-based pedagogy, learners' recontextualization process can be studied by examining students' annotated writing accounting for their use of genre features (Cheng, 2007).

The interrelation among genre-specific knowledge, genre awareness, metacognition, and recontextualization posited by Tardy et al. (2020) is schematized in Figure 2. The theoretical framework constitutes partly language-dependent genre-specific knowledge (e.g., formal knowledge) and the language-independent genre awareness and metacognition. Genre-specific knowledge and genre awareness are

integrated, as indicated with the dashed line, both constituting the larger construct of genre knowledge.

Figure 2

Comprehensive Notion of Genre Knowledge (Tardy et al., 2020, p.306)



The present study adopts Tardy's (2009) genre knowledge as the theoretical framework, hereinafter referring to genre knowledge as the four domains of formal, rhetorical, process, and subject-matter knowledge, which shares the same components with Tardy et al.'s (2020) genre-specific knowledge (Figure 2). To avoid any confusion, the broader concept of Tardy et al.'s (2020) genre knowledge, encompassing genre

awareness, is referred to as *a comprehensive notion of genre knowledge*, whenever necessary.

2.2. History of Genre Schools

This section overviews the history of major genre schools and their theoretical and pedagogical discussions over explicit genre instruction and implicit acquisition of genre. Section 2.2.1 reviews the explicit teaching of genre in the Sydney School and their pedagogical contributions. Section 2.2.2 discusses the implicit acquisition of genre espoused by the New Rhetoric (NR) school. Lastly, Section 2.2.3 delineates the pedagogical approaches and principles of English for Specific Purposes (ESP) in which the current study is rooted.

2.2.1. The Sydney School

Multiple genre schools have had their own theoretical and pedagogical discussions on learners from different contexts. The discussion on genre learning has formed different research traditions and theories, naturally branching out into three schools: the Sydney School, the New Rhetoric (NR), and the English as a Specific Purposes (ESP).

One of the first genre research traditions that initially developed sophisticated genre pedagogies is the Sydney School, rooted in Systemic Functional Linguistics (SFL) (Halliday, 1994). The SFL scholars highlight that text structures and language

vary from context to context, but, importantly, “within that variation, [there are] relatively stable underlying patterns or ‘shapes’ that organize texts so that they are culturally and socially functional” (Feez, 2002, p. 53).

Influenced by the SFL framework, the Sydney School values the cultural and social contexts where a text is embedded. Practitioners in the Sydney School frame genres in terms of social action and educational accomplishment, calling students’ attention to the norms and expectations of genre that impact reader connection, not limited to form (Bawarshi & Reiff, 2010). Their foci of research and practice are placed on the fundamental genres found in educational institutions, such as description and argumentation (Johns, 2003). Ultimately, studying the relation between form and function of genres is a common part of pedagogical practice in this school.

Addressing the needs of primary and secondary school learners as well as second language learners in Australia (Johns, 2003), the Sydney School has contributed to reading and writing instruction with the teaching-learning cycle (Rothery, 1994). The model is based on the work of Vygotsky (1978), which scaffolds the learner through an interactive process of analysis, discussion, and joint and individual construction of texts (Feez, 2002).

The teaching and learning cycle becomes one of the commonly adopted genre-based writing instructions, which outlines five steps: setting the context, modeling, joint construction, independent construction, and comparing (Hyland, 2007). The first stage is to inform genre purposes and the settings in which the genre is used. Writing instruction begins with the purposes for communicating before introducing subject content, composing processes, and textual forms. After the teacher analyzes

representative samples of the genre to identify its stages and key features and possible variations, students work together or with their teacher to construct a text. In this way, students learn to write collaboratively, which facilitates learning through verbal interaction and tasks negotiation with a more knowledgeable person, which draws on the Zone of Proximal Development (ZDP) (Vygotsky, 1978). Afterwards, students engage in independent writing, which is monitored by the teacher through teacher-learner conferencing or teacher feedback. The last step is relating what has been learned to other genres and contexts to understand how genres are designed to achieve particular social purposes.

The teaching and learning cycle scaffolds the learner through an interactive process of analysis, discussion, and joint and individual construction of texts, which explains its wide adoption as genre pedagogy. This cycle and the concrete approach of analyzing organization and form-function relations within genres have made pedagogical contributions not only to the realm of primary and secondary school education but also the ESL adult literacy in English for Specific Purposes. The influence of the Sydney School on ESP is later discussed in Section 2.2.3.

2.2.2. The New Rhetoric School

On the other end of the genre theory spectrum is a major genre school that arose in the L1 North American context called the New Rhetoric (NR). Influenced by Miller's (1984) seminal work on genres as social actions, the NR theorists value rhetorical, social, and ideological stances rather than detailed analyses of language and text organization. Their main argument is that genre knowledge among experts in a

discipline is implicit, which involves uses of content and prior knowledge (Devitt, 2004). Thus, NR scholars do not believe that texts used in classroom study are authentic when removed from their original contexts and purposes. Instead, their view is that the authentic genres are produced in situations in which there is complex negotiation and often multiple audiences. Given that most NR theorists view the composition classroom as inauthentic, their contributions to pedagogy are minimal compared to other genre schools (Johns, 2003). Simply put, the NR theorists admit that it is not easy to apply their theories to teaching in the classroom.

One of the representative arguments of NR is Freedman's (1993) cautionary claim that explicit instruction of genre plays a limited role in novices' acquisition of a new genre in that classroom teachers cannot clearly explain the intricate dynamics of cultural, political, and social issues shaping genre, outside of the real context. Positing Strong and Restricted Hypotheses on explicit teaching, Freedman (1993) maintains that genre knowledge is learned tacitly and instinctively, not through explicit instruction, which is not only superfluous but "can be dangerous" if the instructor does not have accurate understanding of the genre and for learners who overgeneralize and prioritize form over meaning (p. 245). This argument is later reiterated as decontextualized learning being ineffective (Freedman & Richardson, 1997).

Based on the argument around socialization in the discourse community as a requirement for students to use genre-related language skills appropriately, Freedman (1993, 1994) further contends that language skills required in the genre can be naturally acquired, as opposed to being consciously learned in a classroom, only when the student struggles to work on the task in an authentic situation. That is, it is necessary for

learners to engage with colleagues and seniors in the local context of the genre to acquire the required language skills in the discourse community, not limited to classroom instructions.

The skeptical view on the viability and effectiveness of language instructors explicitly teaching discipline-specific writing also resonate with other scholars (Leki, 1995; Spack, 1988). For instance, Spack (1988) argues that "the teaching of writing in the disciplines should be left to the teachers of those disciplines" and the focus of writing instruction should be limited to "general principles of inquiry and rhetoric, with emphasis on writing from sources" (p.29).

In response to the New Rhetoric theorists, warning about the limited values and even probable negative consequences of explicitly teaching genre, some critics of NR argue that emphasizing on the social characteristics of genres may overlook the function textual qualities play in a genre to achieve a certain communicative goal. Hyland (2002b), in particular, pinpoints that their arguments demonstrate a disregard for L2 learners' urgent and practical needs for learning how to generate discipline-specific discourses.

2.2.3. English for Specific Purposes

Respecting both ideals articulated by the two genre schools on opposite extremes of the genre instruction spectrum, the approach to genre in English for Specific Purposes (ESP) could find its place between the Sydney School and the New Rhetoric. ESP is part of an international movement that has been considerably more popular in English as a Foreign Language (EFL) contexts (Hyon, 1996), balancing the need for

explicit instruction for L2 learners and raising their genre awareness. Based on considerable applied linguistics research, ESP has always been proud of its practical bent (Swales, 1988) with a perpetual interest in course design and pedagogies for adult EFL learners who are motivated to learn quickly about specific language registers and discourse communities. ESP aims to help learners with needs for "the quick and economical use of the English language to pursue a course of academic study" (Coffey, 1984, p. 3) as well as rapid progress in their work (Johns, 2003)

English for Specific Purposes (ESP) has had RA genre and its users at the heart of their theoretical research and pedagogical practice. ESP genre studies on researching and teaching RAs have started to blossom since Swales' (1981) move analysis of RA introductions paved the way. His Create-A-Research-Space (CARS) model of RA introductions was one of the seminal contributors that set a new direction of ESP studies by widening the research scope from lexicogrammar to rhetorical moves (Tardy, 2011), giving rise to genre analysis (Swales, 1990).

Swales (1990) develops his CARS model of RA introductions using ecological terms, such as *Establishing a Territory*, *Establishing a Niche*, and *Occupying the Niche*, to name the commonly used moves by authors in multiple science and social science fields to draw attention from their readers as follows (p. 141):

Move 1 *Establishing a Territory*
Step 1 Claiming centrality and/or
Step 2 Making topic generalization(s) and/or
Step 3 Reviewing items of previous research

Move 2 *Establishing a Niche*
Step 1A Counter-claiming or
Step 1B Indicating a gap or
Step 1C Question-raising or

Step 1D Continuing a tradition

Move 3 *Occupying the Niche*
Step 1A Outlining purposes or
Step 1B Announcing present research or
Step 2 Announcing principal findings or
Step 3 Indicating RA structure

A move is defined as "a discoursal or rhetorical unit that performs a coherent communicative function in a written or spoken discourse," which may be flexible in linguistic length (e.g., a word, a sentence, or a paragraph) as it is "a functional, not a formal unit" (Swales, 2004, p. 229). A move can be realized by multiple sub-moves called steps. The terminology of move and step can be seen a dance analogy, as Hyon (2018) explains, comparing characteristic features that identify a written or spoken genre (e.g., a business presentation, a journal article) to distinctive moves define a dance genre, such as the three-step of the waltz and the lasso movements of Gangnam Style dance. As a dance genre cannot be recognized without certain obligatory dance moves yet allows some variations of dance moves across dancers, the same applies to a spoken or written genre with essential moves and certain variation of moves across genre users (Hyon, 2017).

Drawing on Swales' (1990) CARS moves, ESP scholars attempt to understand the ultimate communicative purpose of genre is realized by examining the functions of schematic move structure and its lexico-grammatical features. While a move is regarded as a "bounded communicative act…designed to achieve one main communicative objective" (Swales & Feak, 2012, p. 48), the lexicogrammatical elements realizing a move include, but are limited to, verb tenses, voice, and metadiscourse features. Move

analysis serves as the basis of genre analysis, providing a framework for research and practice in ESP and guiding pedagogical strategies for language and genre acquisition.

Swales' (1981, 1990) move analysis and genre analysis inspired a plethora of studies in diverse genres, including research articles (RAs) (Ahmad, 1997; Samraj, 2002), legal documents (Bhatia, 1993), and business letters (St. John, 1996). In particular, academic genres, mainly RAs, have been significantly influenced by genre analysis, leading to teaching materials and English for academic purposes (EAP) teaching materials (Weissberg & Buker, 1990; Swales & Feak, 1994, 2000, 2004). A large number of ESP scholars have also analyzed how particular sections are organized to perform rhetorical functions in dissertations (Dudley-Evans, 1986; Hopkins & Dudley-Evans, 1988) or science RAs (Posteguillo, 1999).

Burgeoned with Swale's (1990) genre analysis, ESP studies have expanded and blossomed into genre teaching and learning. Based on theoretical and empirical studies, pedagogical materials have been developed adopting move analysis and genre awareness raising tasks analysis (Swales & Feak, 2004), which were well-received as textbooks addressing ESP instructors and learners' needs. Pedagogically motivated studies also analyzed lexicogrammatical features of RAs, such as tense, voice, modal verbs, hedging, metadiscourse features, reporting verbs, and personal pronouns (Hyland, 1998; Kuo, 1999; Tarone et al., 1981; Thompson & Ye, 1991).

Despite its benefits in serving the demands of L2 students, ESP genre-based approaches have not been without criticism. One critical view of genre-based teaching addresses the potential danger of reifying the power structures in which genres are embedded (Benesch, 2001; Pennycook, 1997), an overemphasis on mastery of genres as

access to power (Luke, 1996), and the possible ineffective learning in the classroom, where genre is decontextualized and often divorced from its significant context (Freedman & Richardson, 1997). Critical EAP proponents such as Benesch (2001) and Canagarajah (2002) have stressed the need to pay attention to the socio-political contexts of writing as well as the exploration of teachers' and students' social identities, questioning whether explicit teaching familiarizes students with the complex social, cultural, political, and pragmatic dimensions of the genre. Lastly, the advocates of the New Rhetoric emphasizing context and genre as social action argue that skill-oriented teaching of genre alone cannot allow knowledge transfer to other settings (Devitt, 2009; Brent, 2012).

While these criticisms serve as justifiable challenges and necessary counter-voices, ESP practitioners believe that their applicability depends on how teachers enact genre-based teaching in their classrooms. Many of these concerns can be addressed with approaches stressing rhetorical consciousness raising, student-driven ethnographic and textual discovery, and critical genre analysis (Tardy, 2006). Ultimately, explicit instruction may very well "demystify the rules of specialized writing for L2 writers" (Tardy, 2006, p.96) as coming from different cultural and linguistic backgrounds may give them different expectations about the target genre, therefore need more explicit guidance (Hyland, 2007).

Despite the fact that different genre schools have varied theoretical and pedagogical approaches, at the core of the conception of genre is the dynamic interplay between genre and its social context. Each school varies in instructional frameworks due to different audiences and beliefs about effectiveness of explicit genre instruction for

language learning, but complement one another in advancing the genre theory and pedagogy (Hyon, 1996).

The present study is rooted in ESP among the three genre schools; insights from practice and theory of other genre schools are incorporated into the implementation and discussion of the genre pedagogy at hand. Based on the ESP genre acquisition approach of explicit teaching textual and rhetorical functions of the target genre, the current study applies the principle of the teaching and learning cycle from the Sydney School and extends to discussing the centrality of genre users' authentic genre experience for developing genre knowledge and awareness, a main agenda of the New Rhetoric.

2.3. Studies of Genre Teaching and Learning

This section reviews previous genre teaching and learning studies, particularly in English for Specific Purposes (ESP), ranging from discussing instruction effects to calling for more learner-centered studies of exploring learners' genre knowledge development. Section 2.3.1 overviews studies based on genre-based instruction and discusses their efficacy. Section 2.3.2 delineates genre pedagogy in the English for Academic Purposes, utilizing corpora. Finally, Section 2.3.3 reviews recent studies on learners' genre learning and their comprehensive genre knowledge development.

2.3.1. Genre-Based Pedagogy

Since the notion of genre became a more central agenda in language learning

theories, a majority of writing scholars have paid growing attention to the value of genre-based instruction (Belcher, 2004; Cheng, 2006, 2007, 2008; Flowerdew, 2002; Gentil, 2005; Hyland, 2003, 2004, 2007; Hyon, 2001, 2002; Johns, 1997, 2002, 2008; Swales, 1990; Tardy, 2005, 2006, 2009, among many). Genre-based instruction has been seen as ‘‘the main institutionalized alternative to process pedagogy” (Atkinson, 2003, p. 11). Understanding genres is deemed useful to learners and teachers of writing, in particular, because familiarizing oneself with common features of genres would develop “shortcuts to the successful processing and production of written texts” (Johns, 2003, p. 196).

The genre-based pedagogical approaches can be categorized into implicit or explicit teaching of writing. Implicit genre-based instruction relies on students’ embedded underlying sense of genres (Freedman, 1987) while explicit approaches take the view that students can learn genre knowledge tacitly through exposure to a variety of genres in the classroom. While implicit approaches have solid theoretical foundations, most disciplinary writing instructors believe that students develop rhetorical awareness from engaging with authentic texts through explicit instruction of the target genres in specific discourse communities. Two major overlapping but distinct approaches to explicit genre-based instruction are used to foster students’ genre knowledge: genre acquisition and genre awareness.

The genre acquisition approach, which is commonly used in the Sydney School with the teaching and learning cycle, trains students to reproduce text types that are predictable or staged within specific genres (Johns, 2008, p. 238). This approach has been also used by ESP instructors to teach adult second-language learners, in particular,

how to write common academic and professional genres. For genre acquisition, instructors explicitly teach conventions and moves through the analysis of genre exemplars, involving analytical strategies. Informed by Swales' (1981) analysis of the moves and steps genres perform to fulfill communicative purposes for particular communities, text-based approaches focus on students' collection and analysis of genre exemplars. Specifically, genre analysis, the centerpiece of ESP pedagogy, involves analyzing genre exemplars by noting commonalities and disparities between the rhetorical contexts of the samples, discussing rhetorical effects and potential changes to be made, analyzing lexicogrammatical features carrying rhetorical intentions, and collecting more samples to analyze (Swales, 1990).

The theoretical benefits of genre analysis and genre-based instruction have been manifested in empirical studies with L2 learners, in particular. The explicit genre instruction may enhance learners' awareness of the audience and improve their cohesion and organization in writing (Yasuda, 2011). Moreover, the genre acquisition approach in an academic literacy class showed both immediate and extended effects on students' genre knowledge (Hyon, 2001, 2002). The explicit genre-based instruction was also found beneficial for RA genre learners, who became more aware of the interrelationship between disciplinary culture and the genre structure by arranging different abstracts in the literature review section (Swales & Lindemann, 2002). By heightening learners' awareness of textual features of genre and rhetorical functions of language via explicit and systematic genre-based instruction, learners not only effectively produce genre-appropriate writing (Henry & Roseberry, 1998) but also acquire their membership in the discourse community (Cheng, 2011). As such, numerous studies examined the

effects of explicit genre instruction on students' research writing support (Cargill & O'Connor, 2006; Chang & Kuo, 2011; Lee & Swales, 2006), empirically testing the theoretical endorsement of the genre acquisition approach by gauging the effects of genre-based instructions in improving formal aspects of texts.

As one of the pioneering studies providing empirical support to the efficacy of genre-based instruction, Henry and Roseberry (1998) compared the pre and post test scores of writing tour brochures, using a move score formula they devised to calculate misplaced and inappropriate moves against obligatory moves. Their findings showed that the treatment group who engaged in move analysis outperformed the control group in terms of the overall text motivation and writing texture. Notwithstanding the contribution as a pioneering study advocating the efficacy of explicit genre-based instruction, the move score formula used in the study seems to assume a rigid move structure of the genre, which may impose on learners a fixtated structure, not allowing flexibility of move structure.

Since Henry and Roseberry's (1998) study on the effect of genre-based writing, other studies have supported that the genre-based instruction betters learners' writing performance. For example, progress in the participants' genre writing was shown in the rating measures of content and organization, with progress observed through the comparisons of pre and post summary writing tests (Chen & Su, 2011). Other genre-based instruction studies also showed that learners improve their writing skills with heightened metacognitive genre awareness in the email genre (Yasuda, 2011), and the move structure and linguistic forms in diary and argumentative writing genres (Park, 2007). Many of these studies supporting the efficacy of genre-based instruction share in

common that the tested genres were those that can be readily tested within a limited period of class time (e.g., tourist brochures, summaries, emails, and diaries).

Although these findings suggest the positive effect of the genre-based instruction showing outperformed post-test results, writing studies of genre learners' performance are generally from genre-based instruction on genres other than RAs. Even the genre-based writing studies on RAs have been mostly designed to evaluate the efficacy of genre-based instruction or the surface change in students' use of textual features (Cheng, 2008; Keck, 2006; Johns & Mayes, 1990; Moreno, 1997). It is worth noting that focusing on the analysis of the written text only shows one aspect of students' genre knowledge development (Jwa, 2015), not presenting the comprehensive picture of learners' full genre knowledge development. The evaluating measures for genre knowledge development have been fairly limited, confined to the formal knowledge dimension of genre (e.g., organization, vocabulary, language use).

In a similar vein, a critical view against explicit teaching of genre is that genres are not purely text types but are dynamic structures that "reconstruct situations, communities, writers and readers" (Coe, 2002, p. 199). The contrasting argument, thus, prompts many instructors to consider approaches focused on raising students' awareness to the rhetorical dimensions of genre.

The genre awareness approach is more typically adopted in first-year college writing courses, where students' prior genre knowledge is used to analyze less familiar genres, with an emphasis on the interconnection between context and text (Russell et al., 2009). Commonly practiced in general writing classes where students come from a variety of disciplines and the instructor is not a subject matter specialist, the objectives

of the instruction are to assist students to "become good researchers" about genres (*ibid*, p. 410) in lieu of teaching genres that may not be applicable to all students.

The genre awareness approach is mostly endorsed by New Rhetoricians, notably Devitt (2004), encouraging students to focus on the context in order to identify the ideology and values of the discourse community guiding the textual elements in a genre. ESP's consideration of context in genre analysis, on the other hand, informs teacher methods for teaching students how to examine genres.

2.3.2. Studies of Research Articles in English for Academic Purposes

In response to the needs and difficulties of L2 learners' academic literacy, English for Academic Purposes (EAP) programs have been increasingly prominent in universities worldwide. A wealth of EAP studies have raised key issues including theoretical premises, methodological approaches, and pedagogical issues, ranging from curriculum design to material development (Bhatia, 1993; Flowerdew, 2002; Swales & Feak, 2004).

Previous genre studies on RAs can be roughly classified into two research streams by the research foci: the macrostructure and the micro features. The former body of research places its focus on the rhetorical functions of various RA sections; for example, a large number of studies have been conducted on how particular sections are organized to perform rhetorical functions in RAs (Dudley-Evans, 1986; Hopkins & Dudley-Evans, 1988; Posteguillo, 1999; Swales, 1990) based on Swales' (1990) groundwork for the rhetorical moves in RA introductions. The latter body of research

examines the analysis of linguistic features in RAs such as tense, voice, modal verbs, hedging, metadiscourse features, reporting verbs, and personal pronouns (Butler, 1990; Hyland, 1998; Kuo, 1999; Tarone et al., 1981; Thompson & Ye, 1991). The findings on RAs from both macro and micro perspectives not only contribute to the genre analysis research realm but also serve as pedagogical insights or material for EAP instructions to adopt in their genre-based instruction.

With the rise of corpus studies in more recent years, EAP genre practitioners have made attempts to design genre-based writing courses combined with discourse analysis consulting corpora, exploring the association of top-down genre-based activities and bottom-up corpus concordancing of lexico-grammatical features (Charles, 2007; Flowerdew, 2005, 2016; Lee & Swales, 2006).

One of the pioneering studies on utilizing corpora in L2 academic writing class, Lee and Swales (2006) found that graduate researchers were able to elicit genre-related features from concordancing and comparing corporas. The participants were trained to utilize large-scale online corpora with search skills to better employ the data for inductive and self-learning. After familiarizing themselves with inductive concordancing skills, students compiled their own specialized corpora to make comparisons between their own writing and expert writing. At the end of the course, they presented their discoveries from the concordancing tasks as a final project, reporting that their rhetorical consciousness was raised and the use of corpora helped build their confidence in writing, not needing to always rely on native-speakers or reference books for checking grammar or expressions.

An interesting finding in Lee and Swales's (2006) study is that the L2 writers were able to make corpus-based investigations by comparing the corpus of their own writing and the specialized corpus of expert writing as non-linguists. Their research includes the fewer use of definite articles in medical research papers, the particular pattern of "V-ing" as in "suggesting that…," and collocates of "...of the study" in education journal articles, and disciplinary differences in the use of reporting verbs in the field of statistics.

In EAP, corpora have been used to teach rhetorical functions of RAs (Charles, 2007) or prototypical move structure in dissertations (Flowerdew, 2015) or grant proposals (Flowerdew, 2016). Receiving positive evaluation from students, it was found particularly helpful to identify prototypical move structure patterning in top-down, genre-based activities when followed by bottom-up corpus tasks to identify useful lexico-grammatical patterns for their rhetorical functions (Flowerdew, 2015). Ultimately, the top-down and bottom-up approaches are suggested to be reconciled in EAP writing materials through a pedagogic approach which combines discourse analysis with corpus investigation (Charles, 2007).

Inspired by the enlightening findings from L2 writers' corpus consultation and its potential use in L2 writing classes, more studies were conducted exploring new avenues for utilizing concordancing activity as writing aid tools. Among many, L2 writers were able to extract verb+prep construction structure via concordancing corpora (Yoon & Hirvela, 2004) or the naturalness of their overall writing improved (Gilmore, 2008).

The next line of EAP genre pedagogy studies have adopted specialized corpora as a writing reference tool, customizing corpus data according to the target genre (Charles, 2014; Chang 2014; Flowerdew, 2015; Kennedy & Miceli, 2017). With regards to the aim of concordancing tasks, learners were found to appreciate and enjoy concordancing more when they were not required to induce any grammatical patterns but to look for lexical chunks that they could use in their own writing, namely adopting an "observe-and-borrow mentality" (Kennedy & Miceli, 2017, p. 111). The utility of self-compiled specialized corpora, in particular, has been advocated by EAP practitioners in that their students valued specialized corpora for its direct relevance to the writing conventions of their discourse community (Chang, 2014), and for raising awareness of rhetorical moves when coupled with top-down instruction (Flowerdew, 2015). Empirical studies also show that consulting a specialized corpus can be beneficial to engineering graduate students, often in highly specialized fields, for following writing conventions in their discourse community (Chang, 2013), addressing feedback on their writing (Chang, 2014) and revising drafts (J. J. Kim, 2020).

Overall, the EAP writing studies adopting top-down and bottom-up approaches to genre features received positive responses and evaluation from students; however, it is still not clear how learners develop their genre knowledge or writing performance over the course of the two-part genre-based instruction and corpus concordancing activities.

2.3.3. Studies of Learners' Genre Knowledge Development

The explicit teaching of has been widely practiced in a branch of ESP focusing on academic contexts, English for Academic Purposes (EAP) programs in response to increasing needs and difficulties of academic writing. Empirical studies have advocated the adoption of genre-based instruction in EAP showing that explicit teaching of facilitates EAP learners' reading and writing in L2, often showing long-term effects (Hyon, 2001), and foster awareness of the interrelationship between disciplinary culture and the genre structure (Swales & Lindemann, 2002).

While most of the genre pedagogy studies are concentrated on proving the efficacy of genre-based instruction on students' writing, several empirical studies have focused on L2 students' genre knowledge development from the learners' points of view. Cheng's (2005) study initiates this body of research examining how learners develop genre knowledge with the focus on learners' awareness. His qualitative inquiry about three L2 graduate students in his genre-based writing class shows how the students identified genre elements through analysis of genre exemplars and textualized them in their own writing. Extending the sphere of research on genre knowledge to the learner dimension, Cheng (2006, 2007, 2008, 2011) finds that most of his ESL graduate students noticed more than just surface textual features, both conventional patterns and non-prototypical features (Cheng, 2006, 2007), understanding the authors' intentions, intertextuality, and rhetorical effects in disciplines embedded in the language features by analyzing example texts in the genre. Another example from Tardy's (2009) empirical study lends support to Cheng's findings in that her ESL graduate students developed rhetorical knowledge by interacting with texts from multiple genres, advocating genre

analysis as a practice that enables learners to make sense of language in its context. The common findings from examining learners' genre analysis reveal that learners are able to interconnect the textual and contextual features of their disciplinary genre texts by engaging in analyzing multiple genre exemplars.

Genre analysis, indeed, has gained attention as an instructional framework and a means to raising students' genre awareness in genre pedagogy (Cheng, 2015, 2018 among others). Genre analysis task can function as a framework for not only analyzing learners' target discourse at the pre-instructional stage for EAP teachers to deepen their genre knowledge of students' target genres, but also for guiding learners to learn EAP writing during instruction (Cheng, 2015). Engaging in genre analysis and discussing rhetorical structure develops learners with an increasing control of metalanguage (i.e., negotiation of knowledge claims, self-citation, metadiscourse) which, in turn, provides a perspective for critiquing their own writing and that of others (Cheng, 2015). Given "pedagogical value in sensitizing students to rhetorical effects, and to rhetorical structures that tend to recur in genre-specific texts" (Swales, 1990, p.213), genre analysis tasks have been incorporated into genre pedagogy.

Adopting genre analysis as an instructional framework, a number of genre learning studies have analyzed L2 learners' genre analysis tasks and self-annotated drafts in an attempt to gain an in-depth understanding of learners' genre knowledge of RAs (Huang, 2014; Kuteeva, 2013; Swales & Lindemann, 2002; Yayli, 2016). Interesting findings suggested that explicit genre instruction may have more effect on L2 students' development of formal and process knowledge than rhetorical knowledge

(Huang, 2014; Kuteeva & Negretti, 2016), leaving inconclusive results of L2 genre users' rhetorical knowledge development in genre instructional settings.

Along with more room for exploring the development of rhetorical knowledge, it is also not clear how explicit instruction helps translate students' genre knowledge into writing performance (Huang, 2014). What links noticing genre features to performing them is claimed to be the activation of conditional genre knowledge, which enables the writer to understand when and why to use genre features appropriately (Kuteeva & Negretti, 2016; Negretti & Kuteeva, 2011). This is because reporting what learners know (declarative knowledge) and how to use it (procedural knowledge) may be different from the ability to know when and why to use those skills and strategies (conditional knowledge) (Negretti & Kuteeva, 2011). In the light of conditional knowledge being part of metacognition, Kessler (2020, 2021) posited that genre learners who displayed more metacognition development related to genre awareness throughout the writing course produced better written output in the genre. As such, previous studies point out that the value of exploring the link between noticing and performing genre knowledge of learners in a genre pedagogy writing class.

To date most of the studies on teaching and learning genre knowledge have been conducted within ESL contexts on genre users in the arts and humanity or social sciences. The genre pedagogy scholarship is especially overdone in applied linguistics (Kessler, 2020, 2021; Swales, 2019), calling for more inquiry into diverse contexts such as in EFL or hard sciences. Among the genre studies conducted in EFL contexts, major genre learning studies have been conducted with advanced English learners (Kuteeva, 2013; Kuteeva & Negretti, 2016; Negretti & Kuteeva, 2011) in Europe, some graduate

students in Asia (Huang, 2014; Li, 2006a, 2006b) and the Middle East (Alinasab et al., 2021).

Previous literature of genre teaching and learning research has constantly called for exploring genre knowledge development of learners outside of the English-speaking world in diverse disciplines with different linguistic backgrounds and L2 proficiencies (Gentil, 2011; Kessler, 2021; Kuteeva, 2013; Tardy, 2009). Navigating these new research avenues would add deeper insights into further understanding genre knowledge development or pedagogy. Among others, more studies are needed in tracing learners' genre knowledge change before and after instruction, especially how they create a research gap in the introduction of a research article genre (Kuteeva & Negretti, 2016).

All in all, there is a dearth of research on genre teaching and learning on learners with less English proficiency outside of the inner-circle or soft sciences, where learners often have more advanced verbal skills. As their language environments require more advanced analytical verbal skills, the overrepresented advanced language learners in the soft sciences conceivably start from a better position to conduct genre analysis and express abstract knowledge or concepts. Thus, genre pedagogy needs to be further tested on under-researched learners outside the soft sciences and ESL contexts to see if genre analysis is approachable to this group of learners as much as their counterparts to reap the same benefits that have been reported.

When it comes to the methodological approach to genre learning studies, the majority of research has taken a qualitative view. Tracing the development of learning, genre knowledge development research has been explored from a qualitative perspective (e.g., case interviews, qualitative text analysis). Adopting different methods,

such as mixed-methods or quantitative analysis of questionnaires gauging genre knowledge development, however, would shed more light onto the lesser known genre knowledge and pedagogy as suggested by Kessler (2021) and Tardy (2009).

Despite existing studies on genre learning, further research should be conducted on genre learning in instructional contexts (Tardy, 2009). In particular, more research is needed on how L2 graduate students with different disciplinary and linguistic backgrounds approach genre-analysis tasks, including educational settings outside the English-speaking world (Kuteeva, 2013). In addition, the debate over the effectiveness of explicit genre instruction remains unresolved due to insufficient empirical research (Carter, Ferzil, & Wiebe, 2004). Results of the effectiveness of genre instruction are yet to be conclusive, especially in relation to how it helps translate students' genre knowledge into writing performance (Huang, 2014; Kuteeva, 2013). Most importantly, studies on genre learners' learning processes or outcomes are insufficient compared to the attention to genre-based writing instruction or ESP pedagogical materials (Cheng, 2005, Jwa, 2015).

As shown in the previous literature review of ESP genre teaching and learning studies, more research calls for inquiring about learners' engagement in their genre analysis with genre learners from diverse disciplines and learning environments to deepen the comprehensive understanding of genre learning from learners' point of view.

While most genre learning and teaching studies have been concentrated on advanced learners in soft sciences and ESL contexts, the current study focuses on learners in hard sciences, examining the feasibility of genre analysis with less advanced EFL graduate students in engineering and exploring their genre knowledge

development.

Contrary to their high demands for ESP courses, Korean engineering graduate students have gained little attention in the genre studies arena. The majority of the studies on this cohort address their communicative needs in English (Cho, 2009; N. Kim, 2010, 2015, Kim, 2017; Shin, 2015). The limited number of instructional studies with these learners are corpus studies introducing specialized corpora as a way of promoting learner autonomy and their awareness (Chang, 2011, 2013, 2014) and use of genre-related features found in the RAs of their disciplines (J. J. Kim, 2020). To the best of the author's knowledge, there is no genre pedagogy study in a Korean EFL context, reporting engineering graduate students' RA genre knowledge development and their own voices on their hands-on experience with genre analysis. In such status quo where genre pedagogy studies are needed, the present study delved into the three understudied aspects of novice genre users' learning of genre features in a genre-based writing class, how the noticed genre features translate into writing (or not), and how the learners perceive the given genre pedagogy as a whole.

The current study was designed to explore how Korean engineering graduate students develop and perform their genre knowledge with genre pedagogy that had them analyze genre exemplars and their own writing of RAs over a 15-week of genre-based instruction. By delineating the students' learning outcomes and their perceptions of the genre pedagogy, the present study attempts to throw more light on the learning process and needs of the understudied Korean engineering students in genre learning and teaching studies.

CHAPTER 3. METHODOLOGY

This chapter reports the methodology and backdrop of the present study. Section 3.1 describes the context where the present study was conducted with the background of the study participants and the instructor-researcher. Section 3.2 illustrates the implementation of the genre pedagogy beginning from needs analysis to the elements of the curriculum. Section 3.3 reports the collected data from eight different sources, mostly qualitative in nature. Lastly, Section 3.4 outlines the data analysis process of both qualitative and quantitative data collected in the study.

3.1. Context of the Study

This section delineates the background of the study context. Section 3.1.1 introduces the academic writing course where the study took place. Section 3.1.2 provides the background of the participants. Finally, Section 3.1.3 declares the subjectivity statement of the researcher-instructor, introducing her background and position in the present study.

3.1.1. The Academic Writing Course

The study was conducted in a 15-week, two-credit course for graduate students in the college of engineering at a research-oriented university in South Korea. The course was entitled *Engineering Research Ethics and Writing Skills,* offered by the

department of mechanical and aerospace engineering at the college of engineering at the time of the study (spring 2019). Limited to aerospace engineering majors to enroll, the course was an elective subject, which was a prerequisite for graduation, catering both master and PhD students in the department. The aerospace major was composed of 15 different specialized laboratories under the supervision of 15 professors at the time of the study. Each lab had different requirements for publications depending on the program or the supervisor.

The course, albeit mandatory for graduation, was offered once a year in the spring semester with two class sections. The enrollment was allowed up to a maximum of 30 students per each class section at the time of the study. Each class section was held once a week for 110 minutes with the same curriculum taught by the same instructor, who was the researcher of the study. The study took place in two class sections, which shared the identical curriculum and class materials.

At the time of the study, the course was recently open to first-year students, thus encompassing students at different points in their programs with different research experience. Of the 39 enrolled students in both sessions (morning session: 21, afternoon session: 18), 29 were master students, 8 in the integrated PhD program, and 2 were PhD students. Although the students were from the same department, their associated laboratories varied as many as ten; in addition, specializations diverged even in the same laboratory. Despite the fact that they were part of the same department, the enrolled students were fundamentally a heterogeneous group in terms of their specializations and research and/or publication experiences.

3.1.2. Study Participants

Prior to the beginning of the term when the study took place, the study was informed to the potential study participants in the course syllabus (See Appendix 1), which was posted online during the course registration period, so that the students could make an informed decision on enrolling in the course or participating in the study. Among the 39 students enrolled in the course, 36 (34 male, 2 female) gave written consent to participate in the study by the second week of the term, which was the end of the add-and-drop period. The course syllabus including the participant recruitment notice and the written consent form had been reviewed and approved by the Internal Review Board at the university where the study was conducted (IRB No. 1902/003-001).

The participation of the study included filling in two survey questionnaires, namely needs analysis and final evaluation, attending two interviews with the researcher-instructor in the midterm and finals weeks, on top of completing all the class assignments. The major graded assignments were analyzing model papers of the students' choices and completing a journal article draft depending on their publishing plans reflected in their needs analysis, which was conducted on the first week. The needs analysis of the enrolled students showed that 11 students were ready to write the first drafts of their own research studies during the term (D for drafting as in Table 1), 11 revising their first drafts written before taking the course (R for revising), and 14 with no immediate publishing plans, thus paraphrasing their model papers as they had no research findings to draft yet (P for paraphrasing). Those with publication experience or plans for publishing RAs (Y for yes) or those who experienced an academic

conference were sorted as the genre-experienced group (GE for genre-experienced) for possible difference in genre awareness or performance compared to their counterparts (genre-inexperienced). The specific background information of the study participants is summarized in Table 1.

Table 1

Background of 36 Participants

Name	Age	Major	Program (Term)	English Proficiency	Publication	Publishing Plans	Group
Heetae	24	RP	I (5th)	Beginner	0	Y (R)	GE
Yongbin	36	AANC	Ph (2nd)	Intermed	6 (Kor), 3 (Eng)	N (P)	GE
Duho	25	RP	M (3rd)	Intermed	0	Y (R)	GE
Hosu	25	HRL	M (3rd)	Intermed	0	Y (R)	GE
Takjin	26	XE	M (3rd)	Intermed	0	Y (R)	GE
Kangtae	23	HR	M (3rd)	Intermed	0	Y (D)	GE
Juha	25	RP	I (3rd)	Beginner	0	N (P)	
Youngsu	27	XE	M (3rd)	Advanced	1 (Eng)	Y (R)	GE
Sooil	25	ASM	I (3rd)	Advanced	0	Y (D)	GE
Jongyun	24	NES	M (3rd)	Beginner	0	Y (R)	GE
Jitak	31	RP	M (3rd)	Beginner	0	Y (R)	GE
Sujong	26	ASD	M (3rd)	Intermed	0	Y (D)	GE
Imju	24	AANC	M (2nd)	Beginner	0	N (P)	
Siwon	25	HR	M (3rd)	Beginner	0	Y (D)	GE
Yunhoo	24	AVD	M (2nd)	Beginner	0	Y (D)	GE

Sutek	24	ASD	M (3rd)	Advanced	0	N (P)	
Dohoon	23	NES	M (3rd)	Intermed	0	Y (D)	GE
Sojin	24	NES	M (3rd)	Intermed	1 (Eng)	Y (R)	GE
Wusung	25	AANC	M (3rd)	Intermed	0	N (P)	
Jihan	26	ASD	M (3rd)	Intermed	0	N (P)	
Juwoon	23	AVD	I (2nd)	Beginner	0	Y (D)	GE
Jogun	23	AR	I (3rd)	Advanced	1 (Kor)	Y (R)	GE
Johan	27	XE	M (3rd)	Advanced	1 (Eng)	Y (D)	GE
Yongjin	23	ASM	M (3rd)	Advanced	0	Y (D)	GE
Jinwoo	25	AR	M (3rd)	Intermed	1 (Kor), 1 (Eng)	Y (R)	GE
Sangwu	23	AVD	M (3rd)	Intermed	0	N (P)	
Junil	26	HR	M (3rd)	Beginner	0	N (P)	
Yongup	24	AVD	I (2nd)	Beginner	0	Y (R)	GE
Sikyong	25	ASD	M (2nd)	Intermed	0	N (P)	
Jongwu	24	ASM	M (1st)	Intermed	1 (Eng)	Y (D)	GE
Sunkil	31	FDC	M (1st)	Intermed	0	N (P)	
Jukyong	26	AVD	M (1st)	Advanced	0	N (P)	
Sangho	25	ASD	M (1st)	Beginner	0	N (P)	
Sihun	26	AVD	M (1st)	Advanced	0	N (P)	
Semu	25	FDC	I (1st)	Intermed	0	N (P)	
Jibum	25	AAM	Ph (1st)	Intermed	0	Y (D)	GE

Out of the total 39 enrolled students, 36 students who participated in the study were randomly assigned pseudonyms. The age of the participants ranged from 23 to 36, with the majority falling in age 24 to 25. Among the 36 participants, there were only

two female students (i.e., Imju, Sojin), which is not a rare gender composition in an engineering program at the university where the study took place. The student population consisted of cohorts at different points of time in three degree programs: 26 master's students from their first to third terms, two PhD students in their first or second terms, and seven integrated PhD students from their first to fifth terms.

The participants were associated with ten different laboratories, which are listed as follows: Aerospace Applied Mechanics (AAM), Aero Acoustics & Noise Control (AANC), Aerodynamic Simulation & Design (ASD), Aircraft Vehicle Design (AVD), Autonomous Robotics (AR), Flight Dynamics & Control (FDC), Hypersonic & Rarefied flow (HR), Navigation & Electronic System (NES), Rocket Propulsion (RP), Extreme Energy (XE).

Participants' English writing proficiency was gauged based on their first draft scores, showing that the group was composed of 10 beginners, 17 intermediate, nine advanced students. The first draft score served as the criteria for academic English writing proficiency based on content, organization, and language use, adapted from Kim and Kim's (2017) scoring rubric for English writing for academic purposes (Scoring rubric in Appendix 2). Following the rubric, two native speakers of English with more than seven years of teaching experience of college-level English graded the students' drafts separately after rater-training sessions given by the researcher. Their scores were discussed until agreement was reached with the inter-rater reliability of 92.1%.

A total of five students had published their works at English-medium journals as first author before the beginning of the study; one student published a Korean article (Jongu) and another did an English article during the term (Youngsu). The rest of the 31

students were novice genre learners without publication experience. Among the 36 participants, 22 students had their own data to write for publishing purposes and 14 students did not. Out of the 22 students with plans for imminent publication, 11 students had completed their first drafts by the beginning of the course, thus engaged in revising their draft throughout the writing course (categorized as (R) in Table 1). The rest of the 11 students drafted their first draft during the term, classified as (D). The 14 students without their own data paraphrased a model paper of their choice, grouped as (P). Out of the 36 participants, 23 students were categorized into the genre-experienced group (GE) for either having prior experience with an academic conference or publication or plans for imminent publication.

3.1.3. Researcher-Instructor and Subjectivity Statement

As one of the validation procedures in a qualitative study, it is essential to address researcher bias and engage in reflexivity (Creswell & Poth, 2016), especially in one like the present study where the instructor of the course is the researcher. I was born in the U.S. and grew up in South Korea, re-locating between the two countries from my early childhood until I obtained my master's. Having majored in English literature at a Korean private university renowned for its global programs for international students, I was given an opportunity to study in Australia as an exchange student, which is when I found myself relishing interactions and conversations, especially in English, with people from different cultures and backgrounds.

After dabbling in a few careers in Korea and the States, I went back to school to pursue a professional degree in education with the belief that the classroom is where I

can make hands-on contributions by sharing my experience and expertise with learners in need and bringing about any positive change in the world through the power of education. My first, enjoyable teaching was with immigrant ESL adult learners from Spain, Russia, and Japan as part of a required teaching practicum during my master's in Applied Linguistics at a private university in a metropolitan city in the States. The multicultural environment where I had studied and worked eventually shaped me into an open-minded conversationalist who values interacting with diverse people.

My official teaching career began in a national university language institute in Korea, where I have had a pedagogical privilege and the most singular opportunity to teach a variety of courses across levels of schooling and proficiency for more than ten years. The learners I have catered to range from young learners (K-12), as well as undergraduate and graduate students, to adult learners with diverse backgrounds, such as university staff members and business executives. The programs I have taught and relished teaching include English conversation and academic writing and presentations, where English is the only medium of instruction. Teaching diverse learner groups with different needs has naturally influenced my teaching approach as having learners' practical and instant needs in their studies or workplaces at heart, which is essentially the ESP approach.

Across different curriculums in the language programs, what I consider most important in my class is interactions with learners. My teaching philosophy is that learners should be provided as much input and as many opportunities to practice the language as output, thus setting my first priority to create a comfortable and enjoyable learning environment by frequently interacting with learners and having them interact

with one another during the class. Also, I have been trenchantly attending to students' needs in the areas of error correction and vocabulary expansion, in particular, utilizing my bilingualism, passion for customized teaching, and understanding of Korean students' expectations of English classes from my Korean schooling experience.

Welcoming the opportunity to challenge myself in teaching, I set out to teach university credit courses at a college of education and later a graduate-level course at a college of engineering after three years of teaching non-credit courses. During the three years of teaching credit courses in a national university in Korea, I taught English conversation and academic writing courses, catering to upper-intermediate and advanced sophomores and juniors majoring in English education. Teaching the graduate-level course for engineering majors, I experienced a cultural difference between the two disciplines and learning environments. While the English education majors were more motivated to learn and interact with me in an English-speaking class, the engineering graduate students seemed to be less motivated for interactions even though the medium of instruction was the learners' first language. In particular, senior graduate students in engineering seemed to be exhausted by their heavy daily research duties and preoccupied by attending to other tasks during the class. The bigger class size of more or less 30 students also made it more challenging to engage in class interactions, and the students expected more meticulous guidelines for assignments and grading criteria than previous learners that I had taught before. Consequently, the more challenging and tense teaching environment naturally pressed me to provide more fruitful class activities and detailed feedback as a way of compensating for the lack of

classroom interaction with learners and subject-matter knowledge as an ESP instructor with no more content knowledge than the students.

While teaching this course, I was in my doctoral course at a research-oriented university in Seoul. During the coursework, I attended to academic writing theories, in particular, on which I could base my teaching and research in preparation for my class instruction. After careful research on writing pedagogy and fruitful discussions with peers and colleague instructors, I have come to learn about the genre school among which the school of English for Specific Purposes suits the engineering graduate students in my research paper writing course. Realizing that genre analysis is at the core of genre pedagogy, a pilot study was conducted in the previous term with the move structure analysis before the onset of the present study to familiarize myself and the target engineering students with genre pedagogy. Ultimately, this study was conducted in the class I was teaching in efforts to benefit my students with their genre knowledge learning through a research-based pedagogy with the best of intentions.

3.2. Implementation of the Genre Pedagogy

This section describes how the given genre pedagogy was implemented. Section 3.2.1. reports the needs analysis administered prior to instruction, including the purpose, items, reliability, and results. Section 3.2.2. outlines the class elements of the genre pedagogy.

3.3.1. Needs Analysis

As a necessary procedure in setting the direction of an ESP course, the needs analysis was conducted on the first day of class. The basis of the needs analysis was on the notion that genre approaches provide an effective writing pedagogy by making explicit what is to be learnt, providing a coherent framework for studying both language and contexts, ensuring that course objectives are derived from students' needs, and creating the resources for students to understand and challenge valued discourses (Hyland, 2007). In short, the purpose of the needs analysis was to maximize language learning and linguistic skills for a specific group (Dudley-Evans & St. John, 1998), which was engineering graduate students in Korea learning English as a foreign language in this study.

The needs analysis survey was partially adapted from Cho (2009), inquiring about students' background information and the areas where the learners needed help during the course. The background information section included students' major, point of time in their program, publication experience either in Korean or English, and whether they have their own data to write about during the course. Questions 1 and 2 asked about the most frequently used language for publications in their fields and any requirement for English publication prior to graduation. The rest of the questions were asked on a 4-point Likert scale, inquiring about to what extent they believe that each of the four domains is important for writing English RAs and to what degree they need help in the four subsets of genre knowledge, following Tardy's (2009) model. Albeit fluid in nature, the domains were further categorized for a more detailed analysis of students' needs and development as in Table 2.

Table 2

Genre Knowledge (Tardy, 2009) Inquired in the Survey

Formal Knowledge	Rhetorical Knowledge	Process Knowledge	Subject-Matter Knowledge
Prototypical Forms and Writing Conventions	Dynamics of Persuasion	Drafting and Revising	
Moves and Steps	A Sense of Audience	Intertextuality	
Lexicogram-matical Features	Positioning as an Author	Exchanging Ideas With Peers or Mentors	

In the survey questionnaire, formal knowledge was categorized into prototypical forms and writing conventions, essential components and content of RAs (moves and steps), and frequently used vocabulary and grammar (lexico-grammatical features). Rhetorical knowledge was presented as the purpose of writing RAs, how to increase persuasiveness (dynamics of persuasion), what readers expect from reading RAs (a sense of audience), and how to set a proper position as an author (positioning). Finally, process knowledge was divided into drafting and revising, understanding the interrelation between previous and current studies (intertextuality), exchanging ideas with peers or mentors, and activities relevant to publications, such as corresponding with journal editors or attending conferences. Among the four domains, subject-matter knowledge development was not the focus of the pedagogy but presented in the needs analysis to show the complete composition of Tardy's (2009) model. Subject-matter

knowledge was not a central part of the analysis because it is difficult to capture the development of the construct when the ESP language instructor is not familiar with the discipline (Huang, 2014).

The reliability of the needs analysis questionnaire was Cronbach's Alpha .867, which was deemed acceptable. The questions asked in the needs analysis can be found in Appendix 3. The major results of the needs analysis showed that the top three areas where the students needed help most were in the domains of formal and process knowledge. The majority of participants voted for the two upper scales, "need help pretty much" or "very much," for lexicogrammatical features (90.9%, $M = 3.61$, $SD = 0.659$), drafting and revising (84.4%, $M = 3.30$, $SD = 0.810$) and essential components of RAs (i.e., move structure) (72.7%, $M = 3.27$, $SD = 0.839$). Consequently, the needs analysis showed that the students in the current study needed to learn about grammar and vocabulary, drafting and revising processes, and the move structure of RAs as the top three target areas in the course.

3.2.2. Class Elements of the Curriculum

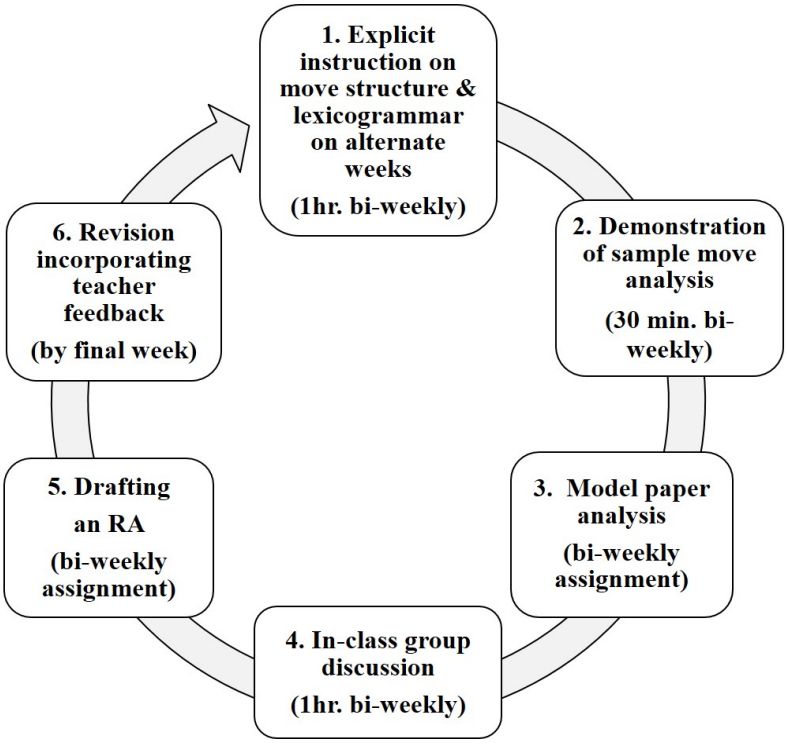
Reflecting the results from the needs analysis, the course was designed to assist the learners with lexicogrammatical features, their drafting and revising, and the basic move structure of RAs, in particular. The students' needs were incorporated into the curriculum devised in the study, which was inspired by the teaching and learning cycle (Rothery, 1994) and Cheng's (2018) genre analysis tasks to provide students with sequenced guidelines for deconstructing model RAs and constructing their own texts in the end.

The class elements were sequenced in the order of the lecture, the model paper analysis, group discussion, drafting or revising, and teacher feedback. Approximately one-hour lecture was given on the move structure and relevant lexicogrammar of the five sections of a research article, respectively, on alternate weeks (e.g., move structure of Methods on week 3, and lexicogrammar in Methods on week 4). The model paper analysis was assigned as a homework assignment every other week after the explicit instruction of move structure, demonstrating a sample text analyzed in class whenever time allowed. More or less one-hour in-class group discussion took place bi-weekly, repeated for the five sections (i.e., Introduction, Methods, Results, Discussion or Conclusion, and Abstract). The class elements arrangement was devised under the guideline for genre pedagogies where sequencing as well as scaffolding enables the complexity of genres to be more approachable to learners (Tardy, 2019, p. 19). Ultimately, the cyclical nature of the curriculum was aimed to inculcate in students genre knowledge while engaging in assignments and tasks on a regular basis throughout the term as shown in Figure 3.

The genre pedagogy in this study is mainly based on Tardy's (2009) genre knowledge, which is also referred to as genre-specific knowledge in her later study (Tardy et al, 2020). The extended model (Tardy et al., 2020) advances the definition of genre knowledge by encompassing genre awareness, recontextualization, and metacognition (See Chapter 2 for the definitions of these notions). Acknowledging the extended definition of their genre knowledge, this study concentrates on learners' development of, which entails understanding the language-dependent knowledge of a specific genre, for the following reasons.

Figure 3

Cyclic Stages of the Curriculum



First, students in the study analyzed model texts and practiced writing within one specific genre. Despite the fact that comparing multiple different genres may raise learners' genre awareness and recontextualization skills (Cheng, 2018), the course initially set out to help students produce a complete manuscript in one target genre, research articles, for realistic reasons. In the given teaching and learning context, having the novice EFL learners analyze more than one genre by practicing unfamiliar genre analysis in addition to drafting a full manuscript in a foreign language was not deemed manageable either to the students or the instructor.

Furthermore, I designed the course with the assumption that the learners would not have much knowledge in the RA genre even in their L1 as this genre is different from daily genres easily exposed to users across languages (i.e., email, recipe). Thus, transfer of genre knowledge from L1 to L2 as in multilingual genre awareness (Tardy et. al, 2020) was not assumed in this study. For these reasons, the pedagogy was aimed to mainly target genre knowledge development, possibly assisted by the metacognitive nature of genre awareness.

3.2.2.1. The Lecture

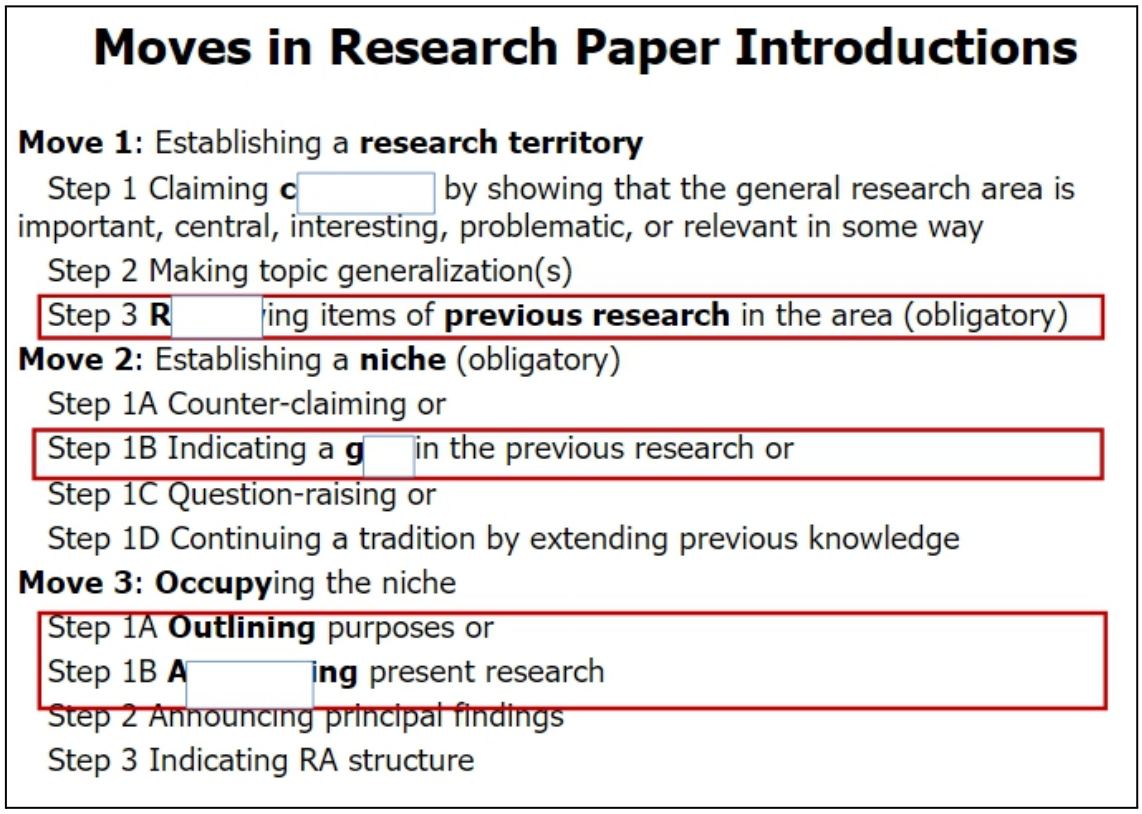
In efforts to foster students' formal, rhetorical, and process knowledge domains, the lecture was composed of explicit instruction of the move structure (formal knowledge), frequently used lexicogrammar in each move with the embedded rhetorical effects (intersection between formal and rhetorical knowledge domains), and finally raising awareness of plagiarism by demonstrating ideal paraphrasing and how to use Turnitin for checking similarity rates (process knowledge).

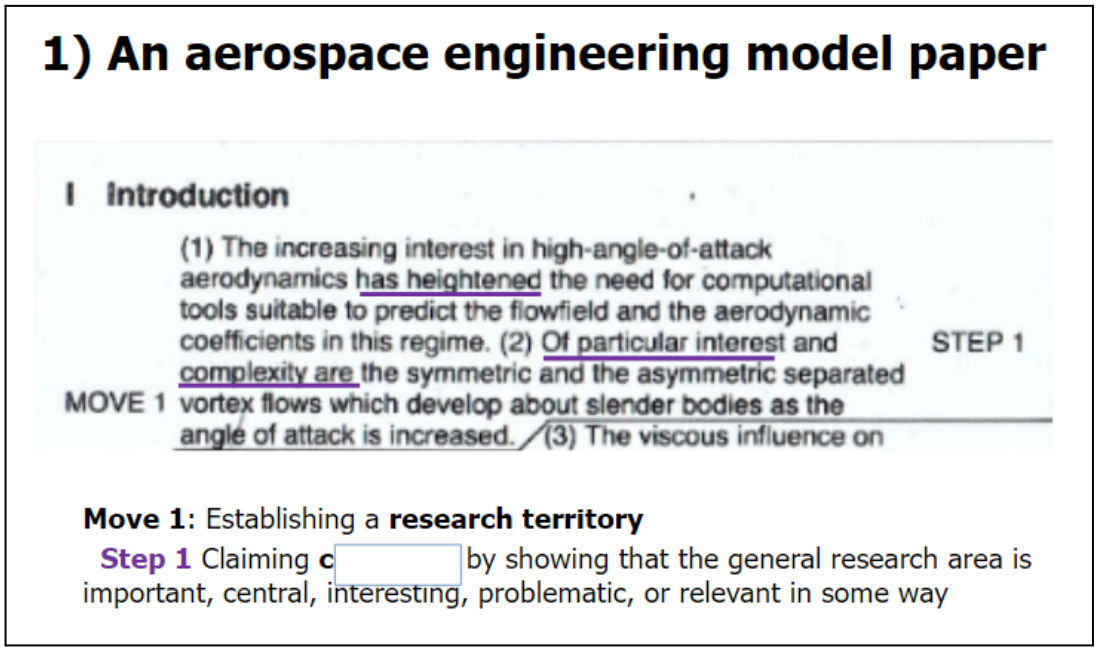
As the first stage of building the context and modeling the text, the typical moves in each section of RAs were explicitly demonstrated to build formal knowledge, followed by deconstructing example RA texts. This practice was grounded on previous research advocating explicit instruction of the top-down move analysis followed by scaffolding of deconstructing a model text (Charles, 2007; Flowerdew, 2015). The main teaching materials were adapted from Swales and Feak (2002) mainly for the move analysis and genre awareness-raising tasks, Cotos et al. (2015) for their furthered move structure framework of the entire RA sections, and Glasman-Deal (2010) for

deconstructing sample texts from scientific research papers in hard sciences. To demonstrate more relatable model texts that could better engage the learners, I added model papers selected and analyzed by students from previous terms to supplement the model texts deconstruction during the lecture. Figure 4 shows example lecture slides used for explicitly instructing the move structure of the Introduction and deconstructing a model text.

Figure 4

Example of Explicit Instruction of Move Structure in the Introduction



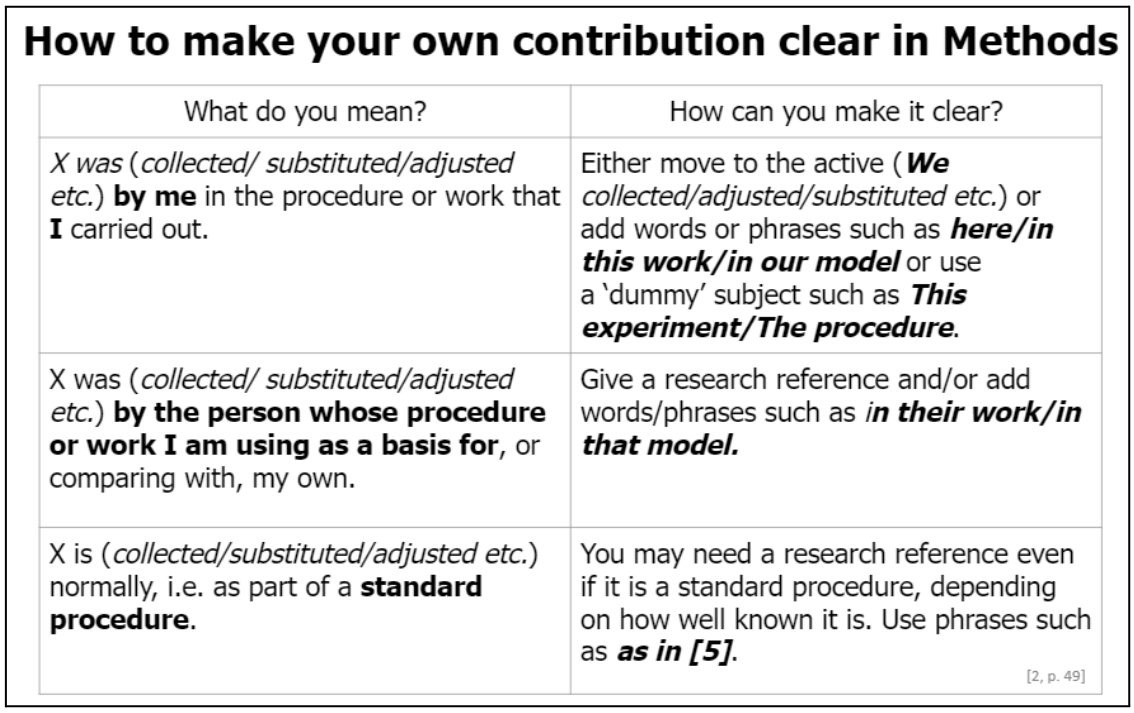


As shown in Figure 4, a typical move structure was first presented with blanks to have the students guess the essential moves or steps (e.g.., *move 1 - step 3: reviewing items of previous research*). Following the explanation of the terms and what each and every move/step denotes, a model text was deconstructed by the move structure with the expressions embedding major moves underlined for highlighting purposes.

As a way of fostering rhetorical knowledge in addition to formal knowledge, grammar and vocabulary lessons were provided with regards to each section of RAs, focusing on their communicative purposes. For instance, tense variation in the Introduction was discussed in efforts to communicate the recency of the research topic or research stream in the form of the present or present perfect tense; change of the voice was dealt in the Methods to indicate whether standard procedures were followed or the researchers attempted novel methods (Figure 5).

Figure 5

Example of Grammatical Lessons in Methods



How to make your own contribution clear in Methods

What do you mean?	How can you make it clear?
X was (*collected/ substituted/adjusted etc.*) **by me** in the procedure or work that **I** carried out.	Either move to the active (***We*** *collected/adjusted/substituted etc.*) or add words or phrases such as ***here/in this work/in our model*** or use a 'dummy' subject such as ***This experiment/The procedure***.
X was (*collected/ substituted/adjusted etc.*) **by the person whose procedure or work I am using as a basis for**, or comparing with, my own.	Give a research reference and/or add words/phrases such as ***in their work/in that model.***
X is (*collected/substituted/adjusted etc.*) normally, i.e. as part of a **standard procedure**.	You may need a research reference even if it is a standard procedure, depending on how well known it is. Use phrases such as ***as in [5]***. [2, p. 49]

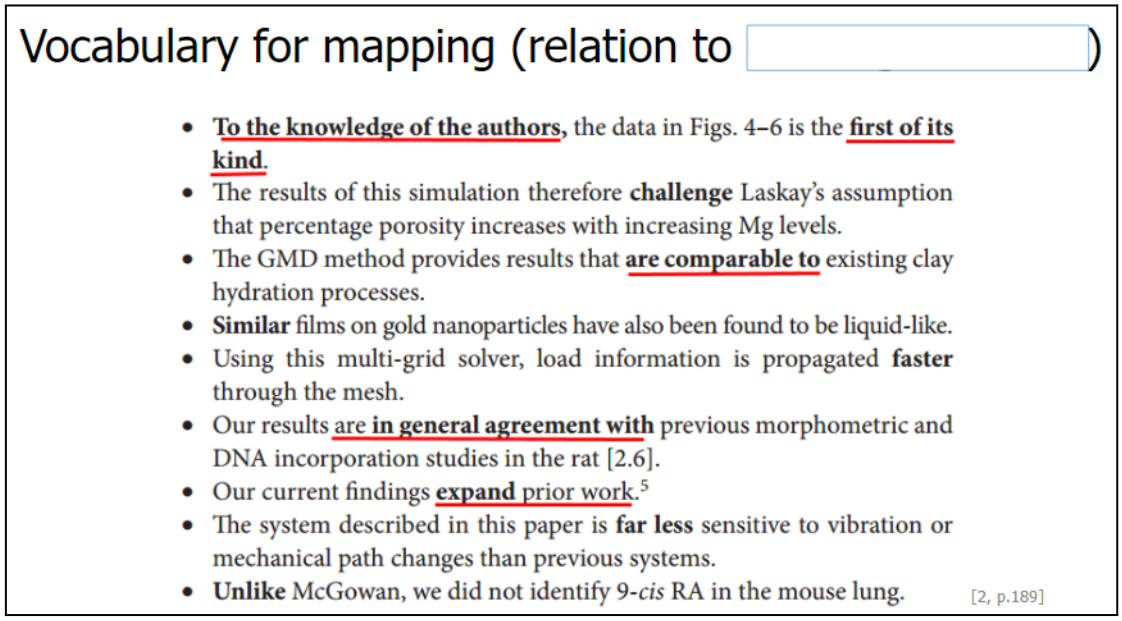
The target grammatical forms, as in Figure 5, were selected from Dudley-Evans and St. John's (1998) key grammatical forms worth drawing learners' attention in ESP courses where learners have difficulty with receptive or productive skills due to grammar (pp. 74-78). Accordingly, the major grammar lessons were taught on the tense, voice, modals, logical connectors, and articles. Lists of useful vocabulary for each section of RAs were also provided in the lecture slides (Figure 6), adapting those from Glasman-Deal (2010) and academic phrasebank (https://www.phrasebank.manchester.ac.uk/).

To better engage students, I often left blanks in the slides as in Figure 6 for them to guess the purposes or communicative intents underlying the frequently used phrases,

so they could connect the form and function of the skeletal phrases. For instance, the underlined skeletal phrases could be adopted to realize an essential move in Results or Discussion relating the current study with previous research (i.e., mapping). These vocabulary lessons aimed to build students' formal and rhetorical knowledge together.

Figure 6

Example of Vocabulary Lesson in Results or Discussion



To further assist their vocabulary expansion, I introduced my students a suite of reference tools that students could voluntarily consult whenever needed during their composition or revision stages: Google Scholar (https://scholar.google.com/), Google Ngram Viewer (https://books.google.com/ngrams), Michigan Corpus of Upper-level Student Papers (http://micusp.elicorpora.info/), and a specialized corpus collected by students in the previous year. The specialized corpus was composed of approximately

200 published engineering journal articles, which was self-compiled by previous students in the same course (J.J. Kim, 2020). The end goal of encouraging students to search or confirm particular lexicogrammatical items with these corpus reference tools was to promote learners' formal knowledge of writing conventions and frequently used lexicogrammar in their fields.

A suite of online reference tools (e.g., Google Scholar) and a free online concordancer called AntConc, required for consulting the specialized corpus, were introduced on week 2. The previously compiled specialized corpus files were shared with the students, who were encouraged to search lexico-grammatical patterns of their choices from class materials to note their rhetorical functions or any questionable phrases to confirm over the course of drafting or revising their manuscripts. The corpus training worksheets were incorporated into the lecture slides on week 10, 12, and 14. The training sessions took place near the deadline for submitting the final draft, so the students would be reminded of utilizing the specialized corpus for fine-tuning their drafts during the revision process, following the writing conventions noted in the corpus. See Appendix 4 for a sample data-driven learning worksheet used in the lecture slides.

The lecture also discussed the interconnectedness of audience, purpose, organization, style, flow, and presentation of academic writing (Swales & Feak, 2012, p. 3) for promoting rhetorical knowledge intersecting with formal knowledge. For example, understanding the target audience (e.g., their familiarity with the topic) was emphasized in relation to the extent of including definitions, background information, and detail in one's writing. Reducing informality in academic writing was also

introduced by comparing stylistic features more appropriate for a formal register and engaging students in exercises replacing informal verbs with more formal counterparts. Additionally, Swales and Feak's (2012) comparison of good-news and bad-news letters were demonstrated to instill in the students that the organization, or placement of the main message, differs by the purpose of writing.

Lastly, the students learned about major citation rules in the engineering field (i.e., IEEE style) and paraphrasing as a way of preventing plagiarism, which was designed to build process knowledge. To address the issues of plagiarism, standards of paraphrasing, and uses of integral and non-integral citations, various materials were adopted. For educating students on the prevention of plagiarism, engineering ethic codes and guidelines (Beer & McMurrey, 2013) were provided and a similarity checker Turnitin (www.turnitin.com) was introduced as the platform where assignments should be submitted. To raise their awareness of plagiarism, students were allowed to resubmit their drafts after checking and addressing any inappropriate similarity detected by Turnitin. Students were also provided with pertinent materials of publishing engineering RAs from lectures and workshops I had attended. Guidelines for paraphrasing were informed with good and bad examples of paraphrasing (Beer & McMurrey, 2013; Swales & Feak, 2012).

On the whole, the lecture attempted to facilitate balanced development of learners' formal, rhetorical, and process knowledge domains. In doing so, a variety of class materials rooted in genre pedagogy as well as engineering educational props were incorporated into the lecture. For reference, the lecture slides used for teaching the Introduction in the present study, edited and formatted for clarity, are available at

https://docs.google.com/presentation/d/1X2j4CcSCRQwcjgCeDecEzmeuI9ttmCL0/edit?usp=sharing&ouid=104283161731269915391&rtpof=true&sd=true.

3.2.2.2. Model Paper Analysis

Based on their learning of typified structure and lexicogrammatical features in sample papers introduced in the lecture, students engaged in analyzing the model papers (RAs) of their selection. The purpose of the model paper analysis task was to get hands-on experience to understand how the rhetorical intent of essential moves are realized in the text by examining lexicogrammatical features in their model papers.

The students initially selected two of their own model papers following the criteria for selecting a good model paper, which were given on the course syllabus in advance to the study, as follows: 1) papers published in a journal where you wish to submit your work in the future, 2) those with the classical structure of Introduction, Methods, Results, and Discussion (IMRD), 3) those written by eloquent scholars or native-speakers of English, and 4) those recently published by a mentor (e.g., your advisor or seniors) with whom you can discuss the writing of the RAs. Considering that the learners would be new with move analysis, one or two papers were seen adequate to begin with the task (Hyon, 2017, p.32). Students were advised to select recently published RAs written by their advisor, seniors or those written by eloquent scholars in the field. The expected effect of selecting RAs written by students' supervisors or seniors was to gain an opportunity to discuss their analysis with content experts to whom they have easier access. Such interactions and discussions with content experts

could supplement what the language instructor may not provide in an ESP class (Johns, 2011).

In an effort to give students sufficient time to select good papers, they were able to make their final choices on the model papers by two weeks after the term. Once they decided on their model papers, they were asked to submit brief reasons for their selection. As the initial process of analyzing model papers, the students highlighted major moves or skeletal expressions reflecting the rhetorical functions of moves in the model paper PDFs, leaving memos of noteworthy moves or lexicogrammatical features.

Before students individually analyzed their model papers, the move analysis on sample texts was demonstrated during the lecture. The model texts were selected from the textbook that guided the organizational structure (refer to the second slide in Figure 4), supplemented by students' model paper analysis samples submitted in the previous term. Sharing previous students' analyses was expected to give a better idea of how to analyze papers in the learners' fields and how move structure overlaps or varies by subfield as it was not feasible to either find or demonstrate model papers representative of all of the students' diverse specializations and topics for practical reasons.

With the aim of providing guidelines for analyzing model papers from a genre-based perspective, a model paper analysis worksheet was devised (Appendix 5) referring to Cotos et al.'s (2015) comprehensive move structure and Cheng's (2018) genre analysis task. Compared to existing genre analysis tasks that require analyzing multiple genres, the aim was to develop a genre task more approachable and feasible for both instructors and genre learners who are either not necessarily familiar with genre analysis or under time pressure to draft and submit their manuscript to a journal during

or after the term. To this end, the genre analysis task was designed to target one genre, RAs, analyzing two papers with an option of adding relevant genres such as short communications or conference papers.

It was also intended to develop a genre task worksheet with more concrete structure and clear guidelines for my engineering students, who are more accustomed to understanding and/or outputting numerical, schematized data than verbose descriptions of abstract, broad ideas from my experience with engineering students. For these reasons, prompts were presented in tables and lists, making it easier for learners to do the task by filling in the tables or listing their responses. Added to the prompt was quantifying the portion of each RA section so they get a clearer overview of the quantity of contents to write in each section.

As a result, the devised model analysis task comprises three integrated activities. The first part of the task is to individually analyze the formal structure and streamline the analyzed move structure referring to the (move) structure models in previous studies (Cotos et al., 2015; Glasman-Deal 2010; Swales, 2004; Swales & Feak 2012). The next part is completed after holding group discussions on their first task, comparing any similar or different move structures across specializations in light of contextual factors (e.g., field-specific features, target audience, purpose of journal). In efforts to bridge receptive skills to productive skills, a sentence-writing task was added to the final part, where learners link the form and rhetorical function of lexicogrammatical phrases of their choices. The sentence composition task was added after the mid-term interviews where students voiced their needs in expanding more vocabulary or practicing more sentence writing.

By engaging in this model paper analysis task, students were able to organize the formal structure of the papers, note commonalities or variations of the move structure across fields, connect the form and its rhetorical function of frequently used skeletal phrases in RAs noticed from the lecture slides or the model papers discussed in their group, and finally practice writing the noticed phrases in their own sentences (See Appendix 5 for a sample model paper analysis worksheet completed by a student).

3.2.2.3. Group Discussion

After the second stage of completing their individual analysis of model papers, students engaged in an in-class group discussion with peers from various fields. During group discussions, students shared their move analyses so they could find any common or differing moves with their functions and discuss any potential reasons for the similarities or differences, reflecting on contextual factors.

The major rationale for adding group discussions to the genre pedagogy was to add another dimension to the individual move analysis by engaging learners with cross-cultural moves comparison, which illuminates variability in move structures (Hyon, 2017). Another reason for devising this class element was because "discussions … in writing classrooms … provide another resource for building genre knowledge" (Tardy, 2009, p. 226) by comparing groupmates' reactions to reading texts and even sharing subject-matter knowledge . Moreover, exchanging opinions with the members of the discourse community, including mentors and peers, contributes to raising learners' genre awareness (Johns, 2011).

In a similar vein, the group discussion element aimed to assist learners with their Zone of Proximal Development (ZDP) (Vygotsky, 1978), where they can learn with guidance from teachers or peers who have more knowledge. Given that the ESP instructor, I, was not an expert in the learners' fields, it was assumed that the students would benefit from learning from their peers who have diverse research or publication experience in their field.

By comparing move structures across related fields in groups, students were expected to learn about flexibility of move structures across fields, consequently heightening their genre awareness, and exchange opinions as part of developing their process knowledge.

3.2.2.4. Students' Self-Annotated Writing

Subsequent to discussing their model paper analyses in groups, students completed the writing assignment that best suited their contingent needs. Since the students were at different points in their programs, they had different needs in writing. For example, some were ready to write down their research findings for publication, while some first year students had not decided on their research topics yet. Therefore, the students were given three choices when it comes to the writing tasks: 1) writing their first draft, 2) revising a previously written draft for publication, or 3) paraphrasing a model paper of their choice. Writing or revising the first draft of an RA served as an authentic task because submitting a manuscript to a journal was the students' immediate goal during or after the term. Those who did not have such plans or requirement of publishing an English RA for graduation were given an option to engage in the

paraphrasing task, aiming to learn by modeling after advanced writers' sentences and move structure while heeding any plagiarism by checking similarity reports from Turnitin.

After completing their writing task, students were asked to review their draft and annotate any genre features they attempted to incorporate, explaining their reasons. Students were required to submit their drafts in the MS word file or PDF, so they could easily leave memos on any noteworthy lexicogrammatical features used to express basic moves or any intended rhetorical effects. A sample self-annotation can be found in Appendix 6.

The purposes of implementing the self-annotation task were threefold. First, it was aimed to raise students' awareness of the move structure in their own writing and evaluate their performance or development. Self-annotation writing enables learners to pay attention to not only the form and function but also their achievements and limitations of their writing, thus raising learners' awareness and autonomy as more effective communicators (Hyland, 2003; Yayli, 2011, 2012). Functioning as a brief self-evaluation tool that shows how learners approach the writing task (Negretti, 2017), students' annotations also serve as a means of assessing learners' language ability or achievement after writing instruction (Hyland, 2003). As such, students' self-annotations on their own writing were believed to enable self evaluation of their writing development as well as facilitating the assessment by an ESP instructor with no clear subject knowledge of the learners' fields. Finally, students' annotations accounting for their use of genre features in their own writing provide insights into the process through which they utilized genre knowledge (Cheng, 2007). Ultimately, examining

students' self-annotated writing was expected to better reveal how the learners develop their overall genre knowledge.

3.2.2.5. Teacher Feedback

The fifth stage of the given genre-based curriculum was revising students' written drafts based on teacher feedback, supplemented by an automatic grammar checker offered by Educational Testing Service (ETS), which was purchased by the university and licensed for free use by the instructors or students. First, the students had their written drafts checked by an automated similarity checker Turnitin, a widely used anti-plagiarism software that identifies either intentional or unintentional sentence borrowing (Stapleton, 2012). The rationale for adopting Turnitin as part of the feedback was to heighten students' awareness of plagiarism and ease the burden of the instructor, who often had to address basic, recurrent grammatical errors in students' drafts. Introducing the software was also aimed to raise students' awareness of plagiarism, closely linked to process knowledge development. Turnitin was associated with an additional grammar checker, that allowed students to check any basic or repetitive grammatical errors immediately, thus offering immediate feedback automatically identified by the grammar checker with a similarity report offered by Turnitin. This element aimed at raising students' formal knowledge and process knowledge together. Finally, students' drafts were reviewed and commented on by the instructor given the essentiality of teacher feedback on top of computer-assisted L2 writing (Min, 2017).

Once teacher feedback was provided, the students were informed to check the feedback on Turnitin, where they were able to check both automated grammar checker results and teacher feedback as in Figure 7.

Figure 7

Snapshot of Turnitin Showing Automated and Teacher Feedback

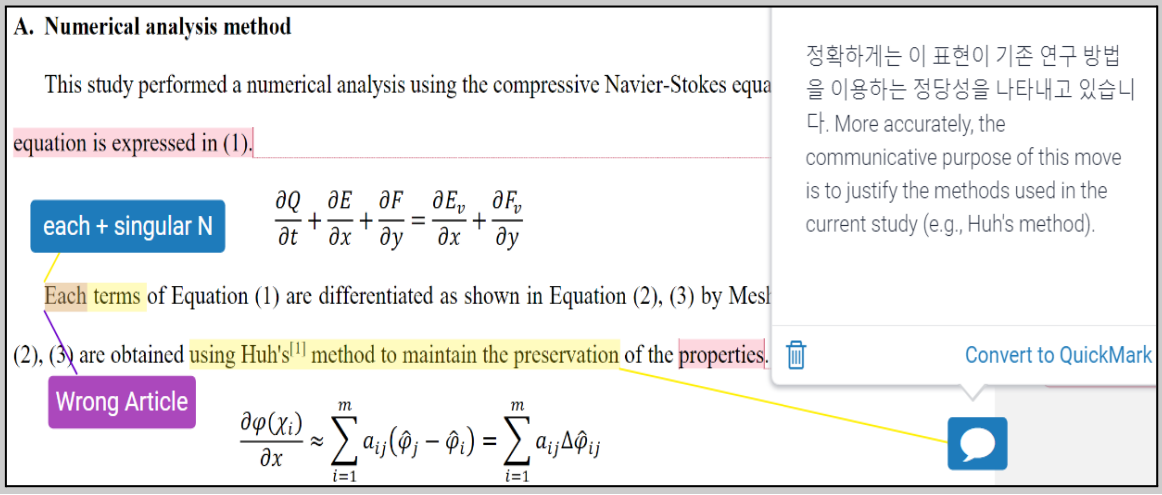


Figure 7 shows the screen where students were able to check ETS automated online feedback (i.e. Wrong Article) and teacher feedback (i.e., each + singular N, comments popped up from the speech bubble) on the class Turnitin website. As the automated grammar checker did not suggest alternatives for the correct use of grammar, I occasionally added lexicogrammatical suggestions (e.g., each + singular N) on top of leaving comments on move structure (e.g., More accurately, the communicative purpose of this move is to justify the method used in the current study), especially when student's annotations of the intended communicative effects or purposes were unclear. Admittedly, it was more clear-cut to provide feedback on lexicogrammatical features

when the technical content in student drafts was not easy to follow as an ESP instructor even though efforts were made to leave comments on organization and move structure. For those who wished to revise their manuscripts multiple times, additional chances were provided to submit revisions on Turnitin before the final project deadline. For limited resources of time and energy, teacher feedback was only provided on students' written drafts submitted by the given deadlines. Finally, students submitted their revision by the end of the term as part of their final project.

Fundamentally, the genre pedagogy was designed to address students' needs in their local learning environment, where English is not practiced on a daily basis and its use is limited to class hours, with the basis on prior genre studies. With the initial focus on the move structure, the curriculum attempted to reflect the learners' needs in polishing vocabulary and grammar by providing ample chances to receive as much input from the lecture by focusing on frequently used grammar and vocabulary in the essential moves of RAs and noting lexicogrammatical features in their model papers.

The overall course rundown is summarized in Table 3. After the needs analysis and diagnostic writing took place in the first week, the course began with lectures on research ethics over the first two weeks, which was required by the department. Following the introduction to online corpus tools for identifying potential useful phrases (week 2) and the overview of research article structure (week 3), the official lectures on each section of research articles were given in the order of Methods, Results, Discussion, Introduction, and Abstract until week 13.

Table 3

Course Rundown

Week	Contents of class	Assignments due
1	Needs analysis, Diagnosis writing, Research ethics and plagiarism 1	
2	Research ethics and plagiarism 2, Using corpus tools to identify potential useful phrases	
3	Overall structure of research articles, Move structure of Methods	
4	Lexicogrammar in Methods, Group discussion 1: sharing model paper analysis_Methods	Analysis of model papers_Methods, Reflection notes on group discussion 1
5	Move structure of Results	Annotated draft_Methods
6	Lexicogrammar in Results, Group discussion 2: model paper analysis_Results	Analysis of model papers_ Results, Reflection notes on group discussion 2
7	Mid-term week: individual interviews	Annotated draft_Results, Revised Methods*
8	Move structure of Discussion & Conclusion	Revised Results*
9	Lexicogrammar in Discussion & Conclusion Group discussion 3: model paper analysis_Discussion or Conclusion	Analysis of model papers_ Discussion or Conclusion, Reflection Notes on group discussion 3
10	Move structure of Introduction	Annotated draft_Discussion or Conclusion
11	Lexicogrammar in Introduction, Group discussion 4: model paper analysis_Introduction	Analysis of model papers_ Introduction, Reflection on group discussion 4
12	Move structure of Abstract	Annotated draft_Introduction

13	Lexicogrammar in Abstract, Group discussion 5: model paper analysis_Abstract	Analysis of model paper_ Abstract, Reflection on group discussion 5, Revised Discussion/Conclusion*
14	Summary of move structure, Course evaluation	Annotated Abstract draft, Revised Introduction*
15	Finals week: individual interviews 2	Revised Abstract*, Final draft & reflection notes due week 16

*: optional assignments for additional feedback

The rationale for beginning the instruction with Methods was to facilitate students' drafting process in that the Methods is one of the feasible sections for those who have completed their research to begin writing even before the study results are obtained for analysis or previous studies are thoroughly reviewed for discussing the results in the Results and Discussion or setting the overall direction of the study in the Introduction. Thus, the genre-based curriculum was implemented in the order of the Methods, Results, Discussion, and Introduction sections. Writing one's draft in this order also allowed students to practice descriptive writing required in Methods and Results sections prior to the more challenging persuasive writing necessary in Discussion and Introduction.

Subsequent to the final instruction on Abstract, serving as the summary of the previously learned RA sections, the course ended with the review of the entire move structure in each section and students' course evaluation in the form of the final survey questionnaire and individual interviews with the instructor on the final week.

3.3. Data Collection

This section reports the data collection procedure and describes each data source used for analysis. All of the data were collected from the participants enrolled in the class in Spring 2019 (IRB # 1902/003-001) and the data were produced as a result of the pedagogical activities and class assignments, amounting from eight sources. Each section reports about the respective data source: needs analysis questionnaire (Section 3.3.1), learners' L2 and L2 writing history (Section 3.3.2), statement of reasons for selecting their model papers (Section 3.3.3), model paper analysis reports (Section 3.3.4), students' self-annotated drafts (Section 3.3.5), student interviews (Section 3.3.6), final student survey questionnaires (Section 3.3.7), and students' final reflection notes (Section 3.3.8). The collected data are presented in the order they were implemented in the class as they were the outcome of the class elements designed in sequence as part of the genre pedagogy.

3.3.1. Needs Analysis Survey Questionnaire

The needs analysis survey questionnaires were collected on the first day of class (N=39). The survey results showing students' needs in formal and rhetorical knowledge domains served as the basis of the genre pedagogy. The student background information provided in the survey, such as publication experience and expectations of the course, served as references during the triangulation of data analysis.

3.3.2. Learners' L1 and L2 Writing History

On the first day of the class, students wrote a short statement, reflecting on their own L1 and L2 writing histories and practices (Belcher & Connor, 2001). They were given 30 minutes in class to write about their L1 and L2 writing history in approximately 200 words. The instructions included, but not limited to, writing about any previous learning experience of writing, the most frequent type of text they have written in recent years, how often they have been writing in the language in recent years, the general process of writing in each language, and strategies mainly used when writing a research paper (or any academic text) in each language. These reflective statements served as background information of the participants when it came to analyzing the main data sources: student interviews, written product, and survey questionnaires.

3.3.3. Statement of Reasons for Selecting Model Papers

After selecting their own model papers, students submitted a brief statement explaining the reasons for selecting the papers. This was to ensure that students carefully select good papers to serve as models, which would guide them throughout the term. The statements included which of the given criteria for model papers, provided in the course syllabus and reminded in class, the selected papers meet and any other good reasons to model after the papers. These statements served as a reference for understanding participants' motivation for the model paper analysis during my review of the model paper analysis.

3.3.4. Model Paper Analysis Reports

Students analyzed and submitted each of the four sections of their model papers bi-weekly, following the lecture on the relevant section, from week 4 to 14. The aim of the model paper analysis report was to integrate their knowledge on contextual factors influencing move structures across fields by noting any general or field-specific genre features in the text. The model paper analysis activity was divided into individual and team tasks, so students were able to discuss any similarities or differences in groups based on their individual analysis. The individual task was designed to serve as the preparation for the group discussion and the team task as reflection after group discussion. The individual task included the file name, numbers of paragraphs or sentences, and the streamlined move structure of the pertinent section in their model papers; the team task section entailed any similarities or differences among the teammates' individual tasks and learned lessons related to any field-specific features, audience, or purpose of the journals. After the group discussion, students recorded at least three essential or useful skeletal phrases learned during the discussion with the corresponding communicative purposes of the phrases. Finally, students wrote their own sentences using those phrases so that they could better internalize the expressions by actually writing them on their own. A sample worksheet can be found in Appendix 5.

The sentence-writing task, in fact, was added after communicating with the students who attended the mid-term interview, where they voiced their higher needs and interest in vocabulary expansion over group discussion. Taking it as an extended needs analysis, a continuous process of modifying the course after learning more about the learners (Hyland, 2006), I added the task of writing their own sentences using the

learned vocabulary. Students were allowed to spare more time on sharing useful vocabulary from the model papers and writing sentences during their group discussion session after the mid-term interviews.

The total amount of the collected model paper analysis reports amounted to 184 reports from 36 students. All of the participants' analyses were thoroughly read multiple times across each student's portfolio and student groups. Any noteworthy student analyses were recorded in a spreadsheet, later categorized by codes and overarching themes from individual codes. The lexicogrammatical phrases the students recorded as useful vocabulary in their reports were later searched in their drafts one at a time to trace any correct or incorrect use of the noticed phrases and their functions.

3.3.5. Students' Self-Annotated Drafts

Given that the students enrolled in the course had different writing needs according to the needs analysis, they were given choices to select the writing task contingent on their publication plans. In an effort to engage students in the most authentic and useful writing tasks, they could either draft or revise their own manuscript in the course. For those who have no research topic or data of their own, they paraphrased their model papers, which they analyzed by the move structure and skeletal phrases, for the general audience, so they could heighten their sense of audience.

Out of the total 36 students, 11 students drafted and revised their own manuscripts, respectively, while 14 paraphrased their model papers throughout this course. The students submitted at least two drafts; one as the first draft of each section of the paper (IMRDA) bi-weekly from week 5 and another as the final draft of the entire

paper by week 16. The rationales for setting multiple deadlines for completing the first draft were twofold: 1) to provide students with an opportunity to reflect on what was learned from the previous week into their writing with fresh memory, and 2) to provide regular feedback on their performance. They submitted their drafts on Turnitin (www.turnitin.com), where they were allowed to check similarity any unintended plagiarism and resubmit multiple times by the deadline. Using this platform was expected to raise students' awareness of plagiarism. Consequently, the total amount of writing produced by the 36 students was at least 294 drafts, including the first and final drafts of the four RA sections, which were subject to the main analysis.

3.3.6. Student Interviews

I conducted semi-structured interviews with the students in person during the midterm (week 7) and finals (week 15), when no lecture was scheduled for them. The purpose of conducting student interviews was to hear about participants' genuine experience with the pedagogy, including any difficulties on their end, any questions on the class assignments, and any change of genre knowledge after the first and final cycles of the curriculum. The interviews were conducted in participants' L1, Korean, to elicit more genuine responses (See Appendix 7 for the translated interview questions).

By the time of the first interview, the interviewees had gone through the first cycle of the curriculum. Scheduling the first interview at this point was to address any questions or areas of improvement with the given pedagogy after they had experienced one cycle. The final interviews were conducted as soon as the term was over to document participants' experience from their fresh memory. The interviewees reported

how they perceived the overall course, what they had learned, and what they would suggest for the future course.

In an attempt to ease the participation, the interviewees were given a choice to choose the most convenient time and place for their in-person interviews. The individual interview time ranged from 9am to 9pm, allowing for their convenience, and the interview venu was in the classrooms in the same building where the students' laboratories were. The classrooms were not only convenient but also a familiar environment for the interviewees to talk about their genuine experience because they had taken classes there or utilized them for extra-activities after class. The classrooms were air-conditioned, properly lighted, and completely empty during each individual interview, ensuring comfort and privacy. To create a relaxing atmosphere in the classroom, I often put on delightful jazz music before the interview started whenever possible.

All of the interviews were audio-recorded with my smartphone in flac file, which has higher audio quality than mp3. The interviews were held in person with the students, except for a couple of phone interviews with those who were attending an overseas conference at the end of the term. The participants were allowed to have a pair interview with a peer from the same group as talking in a group may lower interviewees inhibition and sharing any different opinions in a group could make an interesting comparison of their experience with the same pedagogy. Each interview lasted at least 20 minutes per person and the longest one took 50 minutes, depending on the flow of the interview. The total recorded interview time was 779 minutes 91 seconds.

3.3.7. Final Student Survey Questionnaires

The final survey was administered and the questionnaires were collected on the last day of class (week 14), so the students were able to report about their full-fledged experience with the genre pedagogy. Among the total 40 questions, 36 were 4-point Likert Scale items among which of the first 30 were about Tardy's (2009) four genre knowledge domains and the remainder on three other variables, namely writing skills, corpus use, and change of perceptions. The final survey questionnaire form can be found in Appendix 7. The reliability of the 37 Likert Items in the survey questionnaire was Cronbach's Alpha .903, which is considered reliable.

The 4-point Likert Scale was adopted to survey specific student opinions on the given class activities so their experience can be recorded in a more definite fashion at the risk of forcing a choice when the student has a neutral stance. This decision is grounded on the argument that an even number option is more effective for encouraging respondents to express a clear opinion as respondents are likely to select the mid-point on an odd number scale, not expressing their opinions explicitly or giving clear responses (Brown, 2001). Also, omitting a midpoint option is recommended when the students are under social desirability pressure (Johns, 2005), which could be the case in the present study context, where the students took the survey evaluating the course taught by the course instructor. Finally, the neutral option was taken out because the respondents may opt for a midpoint option when they find the survey items unfamiliar or ambiguous (Chyung et al, 2017), especially with those who might not necessarily be familiar with the items inquiring about genre knowledge, a relatively abstract subject compared to their major engineering. To address any ambiguity, the respondents were

given a chance to ask any questions and clarify their opinions when the given options did not exactly represent where they stand in the open-ended questions, which were added next to each Likert item. Table 4 summarizes the final survey questionnaire items.

Table 4

Final Survey Questionnaire Items (N=41) Grouped by Variables

Variables	Content	Question no.
Formal knowledge	Prototypical forms and norms, and writing conventions of a journal article;	1-3
	basic moves or steps and their communicative purposes;	4-6
	frequently used linguistic and grammatical features in a journal article	7-9
Rhetorical knowledge	Purpose of writing a journal article and dynamics of persuasion;	10-12
	understanding the audiences' purpose and expectations;	13-15
	how to position yourself as an author	16-18
Process knowledge	Drafting and revising a journal article;	19-21
	the purpose and role of citation;	22-24
	exchanging ideas and opinions with mentors or peers	25-27
Subject knowledge	Subject knowledge required for writing a journal article	28-30
Writing skills	English composition skills required for writing a journal article	31-33
Corpus use	Frequency of using corpus search tools for drafting or revising	34-36
Change	Overall perception, knowledge, and skills of writing English journal articles	37-39
Opinion	Favorite or least favorite parts of the course	40

Questions 1 to 33 were given to see how each of the three class elements helped develop respondents' four genre knowledge domains, which were broken down to three subgroups, respectively. Question 34 asked about how often the respondents used the

corpus search tools, introduced in week (no.), followed by a multiple-response question for those who have answered 2 (somewhat used) or above on a 4 point scale (Question 34-1). Question 35 is an open-ended question asking for the purpose of having used the corpus tools or reasons why they were not often used. In the form of a multiple-response question, Question 36 inquired about the most helpful class component that improved the respondents' knowledge of English journal articles or writing skills. Questions 37 to 39 were asked to find out how the given class changed respondents' perception and their knowledge of research papers and writing skills. Finally, Question 40 invited the students to share their opinions about the best part of the class and any areas of improvement in an open-ended form. A total of 35 questionnaires were submitted and subject to analysis.

3.3.8. Students' Final Reflection Notes

By week 16, students submitted their reflection notes as part of the final portfolio, which includes all of their written works and analyses completed throughout the term. After reviewing their previous model paper analyses and revising their draft, they reflected on the three improvements they had made and three further improvements they wish to make in the future. Reflecting on their own performance as such, students tap into their metacognition, which is also accessed when talking about difficulties of any tasks or monitoring their own decisions (Negretti, 2012) as what the students have done in the interviews with me and annotating their own drafts. Given that use of metacognition could be hardly separable from genre knowledge development (Gentil,

2011; Tardy et. al, 2020), collecting these data were expected to reveal developmental aspects of students' genre knowledge.

To sum up the data collection procedures, the collected data are outlined with the corresponding research questions and collection points of time in Table 5.

Table 5

Research Questions and Pertinent Data Sources With Collection Points

RQs	Focus of Question	Data Sources	Point of Collection (week)
RQ1	How learners develop and perform their genre knowledge of research articles in a given genre pedagogy	● Model paper analysis reports	4, 6, 9, 11, 13
		● Students' self-annotated first and final drafts	5, 7, 10, 12, 14, 16
		● Midterm and final interviews	7, 15
		● Students' reflection notes	16
RQ2	How they perceive the genre pedagogy	● Final student survey	14
		● Midterm and final interviews	7, 15
		● Students' reflection notes	16

Multiple data sources were collected for triangulation purposes. Five different sources of data were collected and analyzed to answer the first research question, how learners develop and perform their genre knowledge of research articles in a given genre pedagogy. Three types of data were collected towards the end of the course, except midterm interviews with the students, to address the second research question, how learners perceive the genre pedagogy. All in all, diverse perspectives from different data

sources were subject to data analysis to explore learners' development of genre knowledge and their experience in the given genre pedagogy in-depth.

3.4. Data Analysis

This section recounts the data analysis procedures germane to the two research questions. Section 3.3.1 illustrates the coding process during the qualitative analysis of the data showing how learners build their genre knowledge (RQ1). Section 3.3.2 reports the process of qualitatively and quantitatively analyzing the open-ended and Likert scale responses from the final survey questionnaire, which inquires about how learners perceive the genre pedagogy (RQ2). The purpose of the data analysis in the study was to capture any features of participants' developing genre knowledge and their evaluation of any class elements that possibly assisted their development,

3.4.1. How Learners Build Their Genre Knowledge

In an attempt to address how learners develop genre knowledge over the course of the genre pedagogy, multiple data sources were crystallized in search of overarching themes from a qualitative perspective. The major data sources used to inquire about how learners develop their genre knowledge (RQ1) were model paper analysis reports, which include their reflection after group discussions, students' self-annotations in their writing, student interview transcripts, and student reflection notes. The data subject to

analyses totaled 36 students' model paper analysis reports, students' self-annotations, student interviews and reflection notes.

The qualitative data analysis in this study was guided by the constant comparative method (Glaser & Strauss, 1967; Strauss & Corbin, 1998). First, every participant's data were read through in the sequential order of collection points multiple times, marked with annotations line-by-line in an attempt to describe major actions and assumptions underneath what the data shows. The annotated data was then individually compared for any similarities or differences to extract codes. Once the codes were formed, those with commonalities were grouped together to form subcategories, which were later merged into bigger categories on a spreadsheet. Next, the data under each category were compared across students and data sources, respectively. Finally, the identified categories in each student were compared with Tardy's (2009) genre knowledge model, which constructed the major themes guiding RQ1. Any other emerging themes were applied to the data again for an iterative, spiraling analysis until further details were identified and an overall theoretical understanding of the data could be achieved. This process was repeated several times with months between each round to validate the analysis; only the consistent analysis is reported. The overall coding process is summarized in Table 6, adapted from Kuteeva and Negretti (2016).

To demonstrate a simple instantiation of the coding process, Datum 3.1 was initially coded as *explaining one's own move and step,* Datum 3.2 as *noting common moves across fields* during the open coding stage. These initial codes were grouped together as subcategory labeled *move structure* and then later into category A, where other formal aspects of subcategories were compared across students and data sources

before identified as formal knowledge (FK) in Tardy's (2009) genre knowledge model. The data is translated from Korean, the original language in which it was written by the students.

Table 6

Coding Procedures

Data Source	Open Coding	Axial Coding	Selective Coding
- Model paper analysis - Student interviews -Students' self-annotations on their drafts -Reflection notes	Identify statements referring to formal aspects (A), rhetorical aspects (B), process aspects (C), and intersection (D).	Compare all coded examples under four categories A, B, C, and D. Cross-compare the data collected under all categories for each data source and student. Select examples from each student for verification.	Leave notes for each student across data sources with examples of all four categories. Compare identified categories in each student with Tardy's (2009) model: A: formal knowledge B: rhetorical knowledge C: process knowledge D: intersection

Datum 3.1. Move 2. Occupying the niche

Step 1. Presenting figures and results (Yongup, first draft self-annotation)

Datum 3.2. The common ground is that even if it is the results section, the method used to make such a result is explained again. (Sangho, model paper analysis)

Datum 3.3. The present tense is used to express the results revealed in this study in an effect similar to a general truth. (Johan, final draft annotation)

Datum 3.4. Accepting the feedback on addressing the improper colloquial expression "there is no need to doubt [the credibility and accuracy]" in a journal article, I deleted the phrase and revised it as follows: "the credibility and accuracy of the solution is also *ensured*" (Sujong, final draft annotation, brackets added for clarification)

Any codes overlapped with multiple categories of genre knowledge aspects were placed in the separate category named Intersection (INT). This category reflects the complex, integrated nature of genre knowledge, which eventually indicates extensive expertise on the genre, as Tardy (2009) claims. For instance, Datum 3.3 not only analyzes the grammatical feature, tense, but also the rhetorical effects of using the present tense for expressing the results of the study with “an effect similar to general truth.” This datum was not only coded as formal knowledge (FK) but also rhetorical knowledge (RK), thus finally categorized into intersection (INT_FK+RK). In a similar vein, Datum 3.3 was placed into the intersection because it displays process knowledge (PK) for incorporating feedback during the revision process and rhetorical knowledge (RK) for adopting proper formality for the genre (INT_PK+RK*)*, showing the overlapped genre knowledge domains. The elicited codes for RQ 1 are provided in Table 7.

Table 7

The Coding Scheme

Category	Explanation	Code
Formal knowledge (FK)	Addressing lexico-grammatical features, move structures, and writing conventions	Word choices, tense, voice, article, verb, move structure, field-specific features
Rhetorical knowledge (RK)	Analyzing intended rhetorical effects or contextual factors around the text	Audience, purpose, register, repetition, booster, hedging
Procedural knowledge (PK)	Commenting on writing procedures or strategies	Planning, drafting, revising, asking questions on drafts, discussing with peers or mentors, using citation
Intersection (INT)	Deal with more than one aspect of genre knowledge, linking multiple categories	rhetorical function of moves, citations, or linguistic choices

After developing codes and sorting them into four categories of genre features, the drafts of students who wrote their own data were reviewed multiple times to note how the genre knowledge features coded in students' data sources were performed in their drafts. To identify any overall differences between the two drafts of these students, an online text comparison tool (www.diffchecker.com) was used, which highlights any different parts of two texts with the number of additions and deletions provided. This tool has been used in a previous study on tracing genre knowledge development in

learners' written products (Sommer-Farias, 2020), thus deemed reliable for my qualitative text analysis of students' writing. The highlighting function of Diffchecker allowed detecting any changes between the drafts not only from the word or sentence level but to the move levels.

To evaluate students' development as a more mature writer, their writings and self-annotations were analyzed from a qualitative perspective based on Bereiter and Scardamalia's (1987) knowledge-transformation model. Following their model, the standard for judging students' growth was whether they made revisions beyond word-level changes after they "reconsider a decision or make a new decision on the basis of evaluating what they have already done" in the first draft (p.247).

These criteria are grounded on Bereiter and Scardamalia's (1987) findings that expert writers engage in a dual problem-solving process interacting between content and rhetorical problem spaces, which involve self-reflection, resulting in revisions at the global level (knowledge transforming); novice writers are limited to making local-level changes, separating text and knowledge processings on the belief that knowledge remains intact and writing is merely a matter of conveying it (knowledge telling).

Thus, students whose annotations included self-reflective comments (e.g., those including their plans, questions, intents) followed by above word-level changes in their revised drafts were considered more mature; those whose revised drafts were confined to word-level changes were interpreted as less mature in terms of writing taken place during the study.

3.4.2. How Learners Perceive the Genre Pedagogy

To find out how learners perceived the given genre pedagogy (RQ2), qualitative analysis was carried out on student interviews and open-ended questions in the final student survey, supported by the quantitative analysis of the 4-point Likert scale and multiple responses questions in the final survey questionnaire. The data subject to analyses included midterm and final interview transcripts, responses to 40 open-ended questions, and final reflection notes from 36 students.

Both deductive and inductive coding (Paltridge & Phakiti, 2015; Polio & Friedman, 2017) were used when it came to coding data for RQ 2. As the class elements of the genre pedagogy were designed prior to data collection as preconceived ideas, data regarding the class elements were coded deductively; any idiosynctatic student comments in the data were coded inductively to capture their authentic views on the pedagogy. At the initial stage of inductive coding, the qualitative analysis software Nvivo pro was used to capture recurring keywords and patterns. Using the autocoding function in Nvivo pro, keywords from the entire data sets were first extracted and then refined multiple times until they were saturated.

Following Saldaña's (2015) manual, evaluation coding was adopted in the initial coding process, supplemented by in vivo coding to honor and capture the participants' voices. The rationale for employing evaluation coding method was that the evaluative nature of the final survey suits the context of evaluation codes, which stem from the researcher's or participants' evaluative viewpoints or comments (Saldaña, 2015, p. 141). In addition, evaluation coding is considered suitable for answering the research question about the perspectives of the participants on the genre pedagogy as "the coding system

must also reflect the questions that initiated and structured the evaluation in the first place" (Pitman & Maxwell, 1992, p. 765 as cited in Saldaña, 2015, p. 141).

The evaluation coding served as initially categorizing comments into negative or positive. For example, a comment, “having no one in the same specialization caused inconvenience in engaging in the activity” was coded as a negative evaluation of group discussion (- GD) whereas “The group discussion gave the effect of reading many papers even if I didn’t read them.” as positive (+ GD). Next, major comments representing the evaluation codes were selected from each class component and their key words were put in quotation marks for in vivo coding. If a representative negative evaluation on the group discussion was “we all have the same knowledge level, so it was not as helpful for learning than other activities,” the key words “the same knowledge level” was captured as an in vivo code.

To ensure the reliability of the codes and the coding process, a qualified second coder, a PhD candidate in English Education with prior data coding experience, was invited. Each class component was explained to the second coder to clear any misunderstanding or confusion while coding the data. Next, 20% of the data items were selected from each class component to crosscheck them and sent to the second coder. After a training session of coding a few items one by one together, the same data items were independently coded. Once independent coding was completed, the coding results were compared and discussed until agreement was made on every item. The intercoder reliability was 93.9%, which is considered high. The rest of the data was coded by the researcher.

Lastly, the responses to the 4-point Likert scale and multiple questions in the final survey questionnaire were analyzed to obtain the respondents' general view on the genre pedagogy. The descriptive and inferential statistics were analyzed by IBM SPSS Statistics 26. The rationale of adopting Likert scale, as opposed to items, was because a single Likert item is not sufficient to gauge respective genre knowledge domain, which is multilayered in nature. Each response was, thus, assumed to be interval and subject to parameter analysis. The mean and standard deviation of the responses were expected to provide the general tendency of the respondents' perception of the usefulness of the given genre pedagogy, complementing the qualitative analysis of students' comments from their interviews, reflection notes, and open-ended responses in the final survey. A one-way repeated measures ANOVA was conducted to note any statistically significant differences among the genre knowledge domains.

CHAPTER 4. BUILDING GENRE KNOWLEDGE

This chapter illuminates noteworthy indications of learners' integrated genre knowledge in their artifacts and how the revealed genre knowledge was performed in their written products. Section 4.1 describes the integration of multiple genre knowledge domains present in student artifacts. Section 4.2 delineates how some of the presented genre knowledge is performed and some not in students' written products.

In tracing the learners' genre knowledge development and performance, multiple student artifacts were crystalized: students' model paper analysis reports, comments shared in their interviews, their self-annotated drafts, and reflection notes. Whenever necessary, other data sources were used to supplement the crystallization (e.g., L1 and L2 writing history, statement of reasons for selecting model papers).

4.1. Integrating Genre Knowledge Domains

This section showcases learners' development of genre knowledge intersecting among formal, rhetorical, and process knowledge domains. Section 4.1.1 delineates students' understanding of how move structure can be flexible across fields, showing the most typical intersection between formal and rhetorical knowledge observed from their artifacts. Section 4.1.2 shows enhanced understanding of citing purposes, intersecting rhetorical and process dimensions of genre knowledge. Finally, Section

4.1.3 captures how students' audience awareness affected their reading practices as an example of heightened rhetorical knowledge and formal knowledge.

4.1.1. Variability of Move Structure Across Discourse Communities

This section expounds on the most commonly recurring theme from students' model paper analysis reports, variation of the move structure across specialized fields and types of studies. With no teacher feedback provided on their model paper analysis, all of the students who engaged in group discussion were able to discover non-prototypical move structures, which differed from what was learned in the lecture. Students' own findings were later discussed and confirmed in group discussions. Their analyses are reported by the four sections of the RA: the Introduction (Section 4.1.1.1), the Methodology (Section 4.1.1.2), and the Results and Discussion (Section 4.1.1.3), and the Conclusion (Section 4.1.1.4).

4.1.1.1. The Omission of Establishing a Niche in the Introduction

One of the essential moves in the Introduction across disciplines in Swales' (1990) CARS model is Move 2 *establishing a niche.* This move is often realized by four options from the stronger to the weaker knowledge claims: counter-claiming, indicating a gap, raising a question or making an inference, and continuing a tradition (Swales & Feak, 2012). One of the most widely used options is *indicating a gap* between previous and current studies, implying that "something is missing" (Swales & Feak, 2012, p.348),

which often involves either explicit or implicit criticism of previous body of research (Bloch, 2003) as opposed to continuing a tradition at the other end of knowledge claims.

Students' model paper analysis reports revealed that not all papers included Move 2 *establishing a niche* in the Introduction. Their interpretations of the missing or weakened move were also divergent, drawing on the variability across research types or subfields. The overall shared view was attributing the difference to type of studies, which is epitomized in the following:

Excerpt 4.1 As for theoretical papers, highlighting problems [from previous studies] was always included, but in the case of experimental papers, this part was often absent. This seems to be because in the case of experimental papers, different experimental methods do not necessarily lead to problems, but have their own pros and cons. Instead, the commonalities and differences from the previous papers were emphasized. (Jibum, model paper analysis)

As a first-term PhD student with a background in physics, essentially a theoretical discipline, Jibum articulated the contextual reasons for different move structures between theoretical and experimental studies. He explained that the tendency of finding a more neutral tone of indicating a gap in experimental studies was because "different experimental methods do not necessarily lead to problems," instead having "their own pros and cons." Thus, there is no need to criticize other works for adopting

different methods as opposed to theoretical studies, where problematizing previous findings is more prevalent.

For another instance, Heetae, a fifth-term integrated PhD student revising his own experimental paper, noted that the analyzed model papers "immediately moved onto the introduction of this study without mentioning the deficiencies in previous studies" (Heetae, model paper analysis). Showing no research gap in the Introduction was also echoed by a groupmate of Heetae's. A third-term master student, Duho, who was revising his own experimental paper, reported that "certain papers did not explain the differences from previous studies separately. In general, it is presumed that this is because it was natural considering the order in which research was conducted in the field" (Duho, model paper analysis). Judging from the comments from Heetae and Duho, whose specialization is in the highly technical rocket science, readers of RAs in particular engineering fields may be assumed to predict the next sequence of a follow-up study, thus not necessitating creating a research space due to the technicality of engineering papers.

The omission of Move 2 (establishing a niche) observed in these students' model papers is worth attention as this move serves the purpose of creating research space in the Introduction, which is considered an essential move across fields of studies (Swales, 1900). Omitting Move 2, however, could be seen as a reflection of field-specific features, such as being pioneering fields (Ahmad, 1997) where competitiveness for publication is less fierce, or the nature of continuing the tradition of the same strand of research as found in some model papers in this study. When there is a common goal of expanding the cutting-edge research area in a smaller discourse community, it would not

be necessary to find faults with previous research. Consequently, it would seem as a face-threatening act to criticize works done by predecessors (Ahmad, 1997).

Admitting the tendency of omitting the move in many papers in his field, another groupmate, Juha, from the same laboratory with Heetae and Duho, shared an interesting personal view of problematizing the lack of establishing a niche in the Introduction. A third-term integrated PhD student who paraphrased an experimental model paper, Juha viewed the exclusion of the move as not sufficiently justifying the value of the study:

Excerpt 4.2 The papers showed similar introductory forms, such as introducing controversial and active research areas in the current or practical fields. After that, they began by introducing the detailed background or motivation of the study. However, there were many papers that lacked the justification of the experiment. Justification and the background may be seen as the same, but I thought the content of "justification" is important in that it shows the value of the experiment. Personally, this is a part where I must think about when writing my thesis later. (Juha, model paper analysis)

The comments in Excerpt 4.2 show that Juha sees value in establishing a niche even though the majority of papers analyzed in his group omit that move. From a critical point of view, he describes the papers without the move as "lack[ing] the justification of the experiment" and considers justification "important in that it shows the value of the experiment." Moreover, he considers including the move in his future

papers as he did not have his own results to write during the course. These comments hint that Juha is aware of the purpose or merit of establishing a niche, thus willing to add the move into his own writing. Taking an initiative instead of following the move structure in other papers indiscriminately implies that he understands the flexibility of move structure.

The exclusion of establishing a niche in the Introduction was also noted by Takjin, a third-term master student from a different lab, who also analyzed and revised experimental papers. It is also worth noting that he was able to learn about the fact that there is variation in move structure after comparing his model papers and papers written by his laboratory seniors, which he called “lab papers” as in the following Excerpt 4.3:

Excerpt 4.3 When I checked my lab papers, there wasn’t much establishing a niche in them. So I was going to go in that direction [, not adding the move in my draft], but the move was definitely found in the two of my model papers (Takjin, final interview).

Learning about the variability of the move in the Introduction put Takjin in the position to reconsider his decision of excluding the move. He eventually added the move establishing a niche in his Introduction, implying a global change as a more mature writer, which is later discussed in Chapter 5.

4.1.1.2. The Multivarious Methodology

Different types of research varied in their move structures, especially in the Methods section, where students had the most challenge in analyzing and comparing the moves in their model papers. One of the major reasons for this challenge would be attributed to various subfields at the department as many as 14. Moreover, this variability is compounded by different methodological approaches within each subfield, namely experimental, simulation, and numerical types of research.

Given the diversity of subfields and research types, a practical pedagogical decision had to be made by focusing on the most classical move structure, that of experimental studies. Those who analyzed simulation or numerical papers, therefore, underwent difficulty, in particular. For example, Sangho, a first-term master student who paraphrased a simulation paper, found the analysis not easy because he felt "puzzled whenever the order of the moves in the model paper was different from that learned in the class" (Sangho, final interview).

At the expense of the challenge, students were generally able to verbalize the similarities or differences of the move structure among fields in their model paper analysis reports, possibly due to the group discussion, where collaborative learning often occurred as they were able to share their analyses from different viewpoints.

A typical example of a model paper analysis report was found from Jihan, a second-term master student who selected group discussion as the most helpful class component during his final interview:

Excerpt 4.4 As much as our research topics were diverse such as experiments, computer simulation applications, and numerical studies, I learned that the composition of the papers is different from each other. Although the method section in each field was mostly devoted to explaining the experimental and simulation techniques, numerical research, for instance, devoted background knowledge more than computer simulation applications. As for experimental papers, there were many references to the experimental instruments and experimental conditions used. (Jihan, model paper analysis)

Although he had no experience of writing an RA or taking an English writing class, Jihan was able to display an organized understanding of differing move structures across fields after comparing analyzed model papers in his group as indicated in Excerpt 4.4. Describing differing move structures across fields was the most typical analysis found in students' model paper analysis. Noting the variability of move structures across fields or research types was interpreted as implying students' formal knowledge.

While most of the model analyses were descriptive in nature, as in Excerpt 4.4, an interesting example was found from Sangho, a first-term master student who shared his struggle with analyzing simulation RAs that were structured differently from experimental RAs. Despite the difficulty, he was able to complete a model paper analysis report, drawing on what he learned from other groupmates on the method section, as in Excerpt 4.5:

Excerpt 4.5 The representative lesson that I learned from the group discussion is that I was able to learn the characteristics of a specific academic journal. This is what I heard from a senior in the same lab who is in the same group. When it comes to papers published in the Journal of Computational Physics (JCP), the method section accounts for a much larger proportion than that of other journals. In fact, some of the group members selected the papers published in the JCP as model papers, and through the analysis of the number of people, it was confirmed that the papers published in JCP have long method sections. Through this, I was able to think that JCP may be an academic journal centered on readers who want specific details on the method section in the paper. (Sangho, model paper analysis)

From the analyses shared in his group discussion, Sangho learned that "the method section [of papers in a particular journal] accounts for a much larger proportion than that of other journals" as in Excerpt 4.5. Although this is what he did not discover on his own, learning about the fact that the particular journal has a lengthy method section allowed him to think about the purpose and readers of the journal, which he reasoned as targeting those "who want specific details on method section in the paper" as in Excerpt 4.5. Linking the formal structure and its purpose or audience via exchanging information with seniors with more experience in the discourse community was seen as an example of the interplay between formal, rhetorical, and process knowledge domains.

On the other hand, those done by more experienced students, often later in their programs, included more analytical comments, linking the observed commonalities or variability of move structure to contextual features or rhetorical aspects:

Excerpt 4.6 Engineering papers are usually divided into three [research types]. To take an example of simulation studies, there are a lot of papers to prove that their own code analysis fits well with the theoretical and experimental results. Since experiments are more reliable because they literally show the actual situation, more confident and reliable nuance was observed. Since I'm in the field of ****, the development of the content changes completely depending on whether you study **** only through theory or simulation. (Heetae, midterm interview)

In Excerpt 4.6, Heetae showed a more deepened understanding of the move structure by addressing the rationales behind its variability across research types. He was able to explain that the different structures (formal knowledge) are linked to the purpose of research type and dynamics of persuasion (rhetorical knowledge), depending on the type of methodology used in the studies.

4.1.1.3. The Missing Interpretation in the Results and Discussion

The next RA sections that differed in the move structure were Results and Discussion, which of the two are often integrated by fields or journals. First, the move structure in the Results showed variation in terms of where the methods were restated, how the findings were presented, and whether they were further discussed or not. Next,

Discussion or Conclusion in some fields did either interpret the findings or discuss limitations or future directions.

To instantiate students' divergent approaches to analyzing model papers, one group is selected to showcase individual groupmates' reports differing. A typical example of a simply descriptive model paper analysis was found in Sutek's report. A third-term master student who paraphrased a numerical paper, Sutek plainly summarized the similarities and differences of the move structures in the results and discussion section as follows:

Excerpt 4.7

- Similarities: The description of the validation is always found in front of the results rather than in the methods. Typically, there is one or more validation problems and the structure of invitation to view results – reporting specific results – comparing results – accounting for results is repeated over and over again.
- Difference: Numerical experiments always present analysis of experimental results, but experiments often simply present results without analysis. (Sutek, model paper analysis)

Excerpt 4.7 shows that Sutek simply described the superficial commonalities and differences noted during the group discussion without furthering the possible reasons for the typically observed features, such as validation preceding results in the same section instead of the previous methods section. In contrast, Excerpt 4.8, from another

groupmate Sikyong, includes more contextual factors in relation to the different move structures.

Excerpt 4.8 The structure and components differed greatly depending on the nature of the journal and field. In the case of the experimental papers, the result data were presented without the moves of approaching or construing [the niche], whereas in the case of the optimization papers, the results section included discussion, and all the steps presented in the example were shown except for two steps. In addition, there was a form in which only Move 2 was repeated, starting with Move 1, and there was a paper consisting only of Move 2 and 3. Depending on the nature of the field, there was a strong tendency to analyze only the results from the experiment as for experiment papers, and in the case of scheme development, there was a process of comparing them with other results. When it comes to design papers, all moves tend to appear, perhaps because they deal with a wide range [of scope]. (Sikyong, model paper analysis)

Although generally descriptive, Sikyong adds his analysis to the observed differences across the fields. He attempts to explicate the reason for design RAs including all moves for "they deal with a wide range [of scope]" as in Excerpt 4.8.

The noted field variations were also reported by Sangho, a first-term master student who paraphrased a simulation RA, and Sujong, a third-term master student who drafted his own work during the course, other two group members. Although these two students worked in the same group, they also showed different depth in their analyses.

One was limited to describing the different move structures and the other furthered the analysis to the possible reasons behind the differences.

Sangho learned about the difference in discussing the results by type of research for the first time. Prior to his model paper analysis and group discussion, he thought that all RAs validated their results; he realized that "through this group discussion, it was confirmed that the existence of validation was different by papers" (Sangho, model paper analysis). He specified that while experimental papers did not entail specific validation in the process of analyzing the results, theoretical papers, especially those with a newly developed scheme, included a detailed validation analysis followed by the results of the new scheme. Despite not being able to elaborate on the reasons for such difference, Sangho's formal knowledge could be seen as enhanced as he was able to learn about different manners of presenting research findings in the result and discussion sections across different research types.

By contrast, Sujong, a third-term integrated PhD student, was able to verbalize possible reasons for different move structures, reflecting his rhetorical knowledge. For instance, he analyzed an underlying reason for the move occupying the niche more dominant than construing the niche in experimental studies as "some experimental studies hold great importance of the experiment itself," thus "focus[ing] on presenting the result data obtained in the experiment rather than analyzing the experiment results and the author's opinion." He supported his analysis by the writing practices in experimental research: "We write a series of papers, focusing on presenting experimental data in paper 1 and then analyzing and validating them in various ways in paper 2." The experimental paper discussed in his group did not spare much on

construing the niche because it was the initial paper "written that all the validation parts of the experiment results [would] be conducted in the future work" (Sujong, model paper). As such, Sujong's more analytic comments explaining the variation of the move structure indicates that his genre knowledge is more layered with formal, rhetorical, and process aspects of writing experimental RAs compared to the other groupmates' descriptive ones.

The multiple move analysis reports from an identical group implies that there are individual variations in analyzing the identical features noticed, possibly depending on their experience in the program, gap between familiar and unfamiliar knowledge, and interest in the task, among many other reasons.

4.1.1.4. No Limitations or Application of the Study in the Conclusion

A common feature of the conclusion section noted by students in their model paper analysis reports was that it could be short as one paragraph, and the inconsistent move in the section was the limitation of the study. Those who found no limitations in their model papers interpreted the possible rhetorical effects as "maximizing the reliability of the research by minimizing the limitation or not mentioning it at all" (Heetae, model paper analysis) or "appealing [to the audience] that the results could be used sufficiently without limitation if the results were less assumptious and came out clearly" (Sihun, model paper analysis). An explanation for finding no limitations or future directions in some engineering papers is that it is writers' tendency to keep the ongoing questions about the study themselves so that they can carry out follow-up studies (Berkentokker & Huckin, 2016).

Additionally, some students found in their model papers no moves indicating the applicability of the research findings, which is generally regarded as an important move in engineering. As shown in Excerpts 4.9 and 4.10, more experienced students in their program were able to analyze the reasons why, drawing on field-specific features in more detail:

Excerpt 4.9 Since the algorithm is basic mathematics, the description of the application is important, so the content was included in the conclusion, but the experiment itself did not have a separate section in the conclusion as the application. (Siwon, M3, model paper analysis)

Excerpt 4.10 Depending on the paper, there was a difference to the extent that the future direction of development or the applicability of the research was presented. This is because some academic journals are wary of expanding interpretation of research to some extent, and if the application field is limited, such as numerical interpretation, only the results are given because it is not right to expand it to find meaning in other fields. (Duho, model paper analysis)

As such, students recorded about the variability of move structures across different discourse communities after analyzing their papers and sharing their analyses in groups. The variation of the move structures students noted lend support to previous findings reporting move structure differences not only between relevant fields

disciplines (Samraj, 2002), but also between sub-fields of a single discipline (Ozturk, 2007) as in the cases of the current study.

On the whole, those who displayed more layered genre knowledge when analyzing contextual reasons for different move structures were mostly in their later terms of the program working on their own manuscripts. This could imply that the more experience gained in the program, the more genre awareness gained naturally. The following excerpt encapsulates what the overall students discussed and learned during their group discussions:

Excerpt 4.11 Judging from the similarities and differences [of the move structure discussed in my group], I confirmed that the papers had a similar structure in a large frame, but the manner of presenting the content or highlighted content differ by specific fields. I believe it is important to follow the content and format required in the specific field of research or the target journal by referring to previously published papers. (Duho, model paper analysis)

As noted in Excerpt 4.11, understanding the general commonality and variability of move structure (i.e., "similar structure in a large frame, but the manner of presenting the content or highlighted content differ by specific fields") seemed to allow Duho foster a better sense of following writing conventions in his discourse community or target journals (i.e., "it is important to follow the content and format required in the specific field or the target journal). The ultimate goal of comparing different move structures across sub-fields or research types was so the students understand that move

structure is something not fixed but flexible depending on the purpose of the research or discourse community. As evidenced in the students' model paper analysis reports, students apparently learned that move structure can be flexible across different discourse communities.

4.1.2. Understanding Intertextuality

The next fundamental theme found in the data was heightened understanding of the rationale behind citing other works. Only a few genre-experienced students reported positive changes in clarifying the purpose of the Introduction and why they add citations in the section, which imply process knowledge intersecting with heightened rhetorical knowledge. For instance, Sojin, a master student in her third term revising her own manuscript, raised a question about the proper amount of citation in the Introduction during her mid-term interview. When I asked if her earlier inquiry was addressed in the final interview, she was able to verbalize what she had learned about using and arranging citations:

Excerpt 4.12 There are some studies that can support my paper when I'm not confident [about my arguments], and in the Introduction, I need to justify what I want to say. That seems to be when I need to put in other studies. When I was doing that, I was confused about how much I had to write and explain and how much I had to quote in the introduction. But now, as I get to look up more articles and analyze model papers, it helped me a lot to understand how to set the flow of the introduction by presenting old information at the beginning, as in the

old-to-new information flow [learned in class], or finding limitations of previous studies like you explained in the lecture. (Sojin, final interview)

The comments in Excerpt 4.12 show that Sojin gained a clearer purpose of using citations to strengthen her argument with a clearer flow of presenting past research in the Introduction by the end of the course. Knowing the whys and hows of intertextuality can be seen as interweaving the domains of process and rhetorical knowledge based on Tardy's (2009) genre knowledge model. As in Excerpt 4.12, analyzing multiple model papers and learning about effective information flow in the lecture apparently assisted the promotion of rhetorical and process knowledge.

Another outstanding example of heightened rhetorical and process knowledge comes from Jibum, who experienced a complete change of his understanding of citation during the course. He used to hold misconceptions of citing multiple sources in the Introduction in the engineering field, coming from a different major. Jibum was in his first term of the PhD course at the time of the study and made a transition of his major from physics to engineering. He had majored in physics in his undergraduate and master's before changing his major into engineering after mulling over his career path at the end of his master's. At the time of the study, he was going through the process of adjusting his genre knowledge in physics to genre features appropriate in engineering on his own. In describing the recontextualization process, he accounted for his previous genre knowledge of physics papers, where citations of previous studies are not found as many as in the Introduction of engineering papers:

Excerpt 4.13 It depends on the field of physics, but my field was physical experiment, a field called particle physics experiment. And, in fact, there have been no new results for almost a few decades… There are many theories but no experimental results, so everyone knows about the problems and theories, but nothing new has come out. So that's perhaps why not many citations are seen [in physics RAs] and so is the move of reviewing previous studies. (Jibum, final interview)

Coming from a physics background, Jibum recounted his initial negative view on long introductions in engineering papers before understanding the purpose of reviewing previous studies and described how he eventually got to understand the rhetorical contexts for citing multiple previous works:

Excerpt 4.14 In fact, it [having a physics background] was why I didn't like it at first when I saw many citations simply listed in the Introduction [in engineering papers]. It was before taking this class, and now I recall the papers I had read were written by those who are not good writers. So, that's why the papers looked like just a compilation of studies collected by year or topic with no storyline at all. That made me think that those papers cited studies just to increase the length and fill in the pages-- I heard from my supervisor that engineering papers need at least 20-30 cations. But this time, I was able to compare a model paper in engineering and another in physics [for the model paper analysis task]. This engineering model paper was well-written while reviewing many studies. The flow goes like who started this research topic and how it developed, what their

lab studied and lacked in their previous paper and how they were going to improve the problem. The historical flows could be seen from the beginning, so I thought, many times, that I should model after that. (Jibum, final interview)

Jibum's recounts of his recontextualization process in Excerpt 4.14 merits attention in relation to the influence of genre analysis on process knowledge development. His engaging in the model paper analysis, a form of genre analysis task in this study, enlightened him with realizing the purpose of citing previous studies, which is to provide the history or background of the study to be introduced. Comprehending the purpose and role of citation (i.e., intertextuality) is a part of process knowledge as it is knowledge required during one's writing process (Tardy, 2009). In this sense, Jibum's change of perception on multiple citations in engineering papers can be seen as development in his process knowledge.

Apparently, Jibum's awareness of the rhetorical effect of citation was fostered during the study by analyzing model papers as a class component. It was not until he selected and analyzed model papers following the guidelines for selecting good model papers in this class when he fully understood the purpose of intertextuality. He recalled his past reading experience as reading RAs "written by those who are not good writers" before the class as in Excerpt 4.14. In his statements for selecting his model papers, he explained that he had chosen recent papers on familiar topics from his target journals, written by an inspiring native speaker of English scholar in the field and an acquainted scholar with whom he could discuss the paper for having collaborated with him recently. Among many other factors, selecting and analyzing well-written model papers

for genre analysis may have played its part in heightening Jibum's genre awareness of intertextuality.

Finally, a paragon of intersecting multiple genre knowledge domains was found in Jibum's reflection notes. His overall experience in the genre pedagogy is encapsulated in his reflection notes, showing the overlapped genre knowledge:

Excerpt 4.15 The biggest change seems to be in writing the Introduction. Previously, I thought that the Introduction section was too long to read and only used to add the number of pages in the paper probably because I hadn't properly analyzed a well-written paper before. But through this class, I realized that introduction is where you precisely state the problems and future research areas of previous studies, needs for the current study, and improvements made in the field, so readers who are not familiar with the topic can fully understand the importance of the study and classify related materials by topic and time. So not only readers but also I found that I get to organize my study once again and understand it more intuitively as a writer. (Jibum, reflection notes)

His comments succinctly represent an ideal integration of the three genre knowledge dimensions under examination in this study. Understanding what to write in the Introduction as in Excerpt 4.15 (i.e., "introduction is where you precisely state the problems and future research areas of previous studies, needs for the current study, and improvements made in the field") speaks to a clearer formal knowledge. His change of view on the purpose of writing the Introduction and sensitivity to readers in "so readers

who are not familiar with the topic can fully understand" hint at burgeoning rhetorical knowledge. In consequence, Jibum's sensitized rhetorical knowledge empowers him as a writer promoting his agency as in "I get to organize my study once again and understand it more intuitively as a writer," which indicates his engagement with process knowledge while reviewing his own writing.

4.1.3. Readerly Writers and Writerly Readers

In the genre-experienced group, those who were working on their own manuscripts displayed heightened reader sensitivity with its positive influence on their view of writing while their counterparts in their early terms paraphrasing model papers showed mixed hints at the awareness of readers and its connection to writing practices.

Among the students who worked on their own drafts, nearly half of them revealed reader sensitivity as a writer and potential for an experienced reader to writer's intention. For example, Yongup, a second-term integrated PhD student who revised his experimental paper, represents the aspects of readerly writer and writerly reader (Hirvela, 2004):

Excerpt 4.16 After [taking] this course, I realized, above all, that "How will the reader accept this part when reading it?" is also very important in addition to how to explain what I know. I think I was able to learn about not only providing rigorous content but also how to consider easing readers' reading. [For example, by adding phrases such as] "as follows:" or "1) to 4)" and briefly explaining the content in advance and making it concrete…. My expression of words seems to

be getting richer. Above all, when I read my thesis in the future, I think I can read it not only [focusing on] the content but also with the mindset of "Why did the author write this word in this part?". (Yongup, final reflection notes)

Excerpt 4.16 reveals Yongup's extended perspective of writing from writer-oriented to reader-oriented by the end of the course, when he reflected on his learning and writing over the term. With readers in mind, he learned about adding phrases that facilitate reading, especially before introducing a numbered list. The extended view of considering the readers as a writer eventually puts him in the position of a reader pondering over any rhetorical effects of the author intended in word choices. The examples of his heightened reader sensitivity were also observed in his final draft (His excerpts are analyzed in Chapter 5.2).

In a similar vein, reader sensitivity was found in Jibum's comments, displaying his genre knowledge intersecting between rhetorical and formal dimensions as manifested in the following:

Excerpt 4.17 Before I took the class, I'd paid a lot of attention to what topics to put in my thesis and what [content] to deal with in the paper, but I've been thinking more about how to express this as I've taken the class. In the past, I kept looking for what I should do and things like this, but these days, I think about how I should express them in order to make [my audience] understand. (Jibum, final interview)

Excerpt 4.17 indicates Jibum's encouraging shift from writer-oriented approach to reader-oriented perspective. Paying attention to his lexical choices with the readers in mind (i.e., "but these days, I think about how I should express them in order to make [my audience] understand") can be seen as formal knowledge coupled with rhetorical knowledge as his sensitized reader awareness guides his lexicogrammatical choices.

A different type of reader sensitivity was captured in Heetae's annotations, where he reminds potential readers of crucial information for emphasis purposes: "[Adding 300 Hz] is a reminder for the readers because the first time it was mentioned that the first mode corresponds to 300 Hz was far before the current location. The same goes for 1000 Hz" (Heetae, final draft annotation). This indicates that his sense of audience is manifested in the formal features of the text. The repetition of content was driven by his intention of referencing again the information worth remembering for the readers. Heetae's example is interpreted as rhetorical knowledge interplaying with formal knowledge in this study.

Another example of experiencing the change of reading from the writer's point of view in the genre pedagogy was noted in the interviews with Takjin, a third-term master study revising his experimental paper. He shared in his interviews that the model paper analysis he engaged in not only instilled in him a sense of authorship but also a new habit of reading, locating essential moves and with more attention to rhetoric embedded in textual features:

Excerpt 4.18 Compared to taking this class before, I've thought about something I didn't think about when I was reading or writing an RA, which was really good.

> For example, I used to read or write a paper only to acquire information, but now I have to check the structure of my writing…. As I do that, I feel that I have developed the ability to grasp more details or the author's intention when I read a paper. (Takjin, midterm interview)

As evidenced in his midterm interview, gaining awareness of the move structure was a big change for him, enabling him to pay attention to the rhetorical structure of RAs. Being able to read the author's intention through the structured moves is a reassuring development of rhetorical and formal knowledge. This change was consistent throughout the term as Takjin shared similar view during his final interview as follows:

Excerpt 4.19 While taking this class, I've changed a lot. Honestly, I didn't check moves or steps or anything before. From the perspective of an engineering student, I thought the most important thing was to quickly grasp what the author wanted to say in this paper and what methods were used. I didn't think about moves or steps...Through this opportunity, I learned how the RA is formed. I think I got to know about which parts I should focus on reading (Takjin, final interview).

When he was asked which parts he would read selectively, Takjin said he would read the establishing the niche move in the Introduction, where the value of the paper is shown. He used to read the entire section of the Introduction, but he can save the time and trouble of going through the entire section now that he knows where essential

moves are usually located, thus being able to scan for the gists he is looking for more promptly. This change of reading strategy implies Takjin's enhanced understanding of the reading practice of the genre users, which is an example of heightened process knowledge.

While the transition from scanning for information to analyzing author's intents provided insight into writerly readers for students like Takjin, it did not seem to be an easy process for students with less reading experience in the program. Reading for content information is naturally what novice readers do as echoed by Jihan, a second-term master student paraphrasing a simulation paper. Without having much knowledge in the subject-matter content, it was not likely to be easy for him to fulfill both purposes of acquiring content knowledge and analyzing rhetorical intents embedded in the move structure during the model paper analysis:

Excerpt 4.20 When I read a paper, I focus on the content rather than the expression. But while doing the [move analysis] assignment, in some ways, I don't get to pay attention to the content and just look into [lexicogrammar in the moves]. While doing so, I realized that there were a lot of times in the past when I didn't know the words or expressions and things like grammar [while reading] and just moved on to the next. And it occurred to me many times [doing the move analysis assignments] that it wouldn't really help me to keep reading in the old way when I want to write a paper in the future. (Jihan, midterm interview)

For Jihan, noting the major moves with the relevant lexicogrammar as part of the genre analysis apparently cost him “not paying attention to the [subject-matter] content” although he came to the realization that reading for information without noting lexicogrammar “wouldn’t really help [him]...when [he needs to] write a paper” as in Excerpt 4.20. In other words, he seemed to learn that it would be more beneficial to adopt a writerly reader stance for his writing purposes. Another student, Sutek, a second-term master student who paraphrased a numerical paper, recounts his reading practice before and after the genre pedagogy as follows:

Excerpt 4.21 I am actually in my master’s, so I engage in reading papers more rather than writing one. When I read English RAs, I read them roughly because it's English, and I read the keywords, focusing on acquiring information. Besides that, after learning about grammatical expressions [from the class], I think I was able to see where the writer was stressing and things like that more efficiently. (Sutek, final interview)

Excerpt 4.21 suggests that the lexicogrammar lesson Sutek learned in the course equipped him with an added perception of grasping rhetorical intentions of the writer to his usual reading practice, skimming for main ideas by following the keywords.

Insufficient subject-matter knowledge and academic experience in the field may also complicate understanding the shared conventional practice in one’s discourse community. Reflecting on the difficult process of analyzing model papers, Sangho, a first-term master student who paraphrased a simulation paper linked his experience as a

reader to writing a more reader-friendly text. When he was asked about how he would use technical terms in his own RAs in the future, he shared an interesting view:

Excerpt 4.22 I'll try to write mine easily to understand. That would be convenient for the readers. Even if they have expertise, wouldn't it be easier to read if explanations are added? Considering that, I don't think I'll write [my future papers] too dry because I had a very hard time reading [the model papers] as a reader. It was a good experience though. (Sangho, final interview)

Reflecting on his own experience as a novice reader in the field, Sangho remarks that he would not write his future papers "too dry," including technical jargons without explanations of them, as in Excerpt 4.22. Putting himself in the novice readers' position could be seen as an indicator of audience awareness. What needs to be noticed is, however, Sangho's comments actually imply the hardship of reading, not to mention analyzing, model papers, serving as the impulse to writing future papers with more explanations added to technical terms. This may hint at his unclear understanding of his discourse community practice, where jargons are usually assumed for journal article readers.

Ultimately, the dominant themes across student artifacts were found in the intersection between formal, rhetorical, and process knowledge domains. At the intersection between formal and rhetorical knowledge were the understanding of move structure variability and audience awareness, which often guided students' reading practices and attention to word choices or information allocation in writing. The overlap

between rhetorical knowledge and process knowledge was also observed from students' heightened intertextuality and citation practice.

4.2. Performing Genre Knowledge

This section qualitatively delineates students' writings in line with their integrated genre knowledge previously reported in Section 4.1. Beginning from the most dominant aspects of students' genre use in their text, Section 4.2.1 illustrates how students' awareness of register and audience affected their approach to grammar and word choices as the manifestation of heightened rhetorical knowledge and formal knowledge. Next, Section 4.2.2 demonstrates students' attempts to enhance coherence of their text to be more reader-friendly. Section 4.2.3 showcases encouraging changes in students' drafts with regards to supplemented move structure, displaying the integration of formal and rhetorical knowledge dimensions. Section 4.2.4 captures noteworthy use of citations avoiding plagiarism and attention to citation form and function. The ideal cases are also compared with the most typical cases and those showing the gap between noticing and performing genre features wherever applicable.

4.2.1. Lexicogrammar and Register at the Language Level

One of the most prevalent aspects of genre knowledge reflected in students' writing was found at the intersection between formal and rhetorical knowledge domains. All of the 36 participants were able to address their use of lexicogrammar, such as tense,

voice, and frequently used skeletal phrases in RAs, in their annotations. The vast majority of them attended to lexicogrammatical features with local-level changes made in their final drafts.

Among the participants, four genre-inexperienced students (i.e., Imju, Semu, Sutek, Sihun) and four genre-experienced students (i.e., Duho, Takjin, Sujong, Jibum) were particularly concerned about using lexicons appropriate for the formal register of the RA genre. The formal and rhetorical aspects of genre knowledge were clearly pervasive in these students' annotations, accounting for the rhetorical functions or intent of the lexicogrammar they used in their writing. For example, questions about lexicogrammar choices in relation to formality were occasionally raised in the annotations as in "I think the expression *presented here* is grammatically correct, but I wonder if it can be used in a research article" (Imju, first draft annotation).

In this study, students' attention to lexicogrammar was interpreted as budding formal knowledge; comments or questions regarding formality or rhetorical intent (e.g., boosting, hedging) as rhetorical knowledge; and citation practice and exchange of ideas with the instructor for feedback over drafting as process knowledge. Students' excerpts are demonstrated from the most typical to the most noteworthy examples in this section.

The first example epitomizes the most common local-level annotations students left in their drafts with regard to the use of tense and voice. As each section of the RA was given as a separate writing assignment bi-weekly and due by the week following lexicogrammar lessons, most of the students were able to apply the learned lessons to their writing with fresh memory. Those who paraphrased a model paper, in particular, might have naturally adopted the correct tense and voice from the published articles.

Consequently, most of the students made the correct choices on the tense and voice in their first drafts, thus not necessary to change them in the revision. Table 8 shows an example of a 1st-term integrated PhD student Semu's correct use of tense and voice based on a clear understanding of their usage, which is boldfaced and annotated by the student as follows.

Table 8

Excerpt From Semu's Draft and Annotation on Tense and Voice

Final Draft	Annotation
Introduction	
Recently, fixed-wing unmanned aerial vehicles (UAVs) **have been widely used**[SL1] in military, civil, and scientific areas for the purposes of surveillance, localization, and mapping [1], [2]. In most outdoor conditions, a robust control system is required to maintain stable flights of UAVs. Among many advanced control techniques, proportional-integral derivative (PID) controller [*sic*] **is**[SL2] one of the most commonly used controllers in autopilot because of its implementation simplicity and low computational demand [10], [11]. Research shows that it is suitable for small scaled embedded processors used for UAVs (Move 1: Establishing a territory) .... Wind tunnel tests and computer simulation **are performed to validate**[SL3] the effectiveness of the proposed method (Move 3: Occupying the niche).	[SL1] The present perfect tense was used to reveal that research has been actively conducted. [SL2] The present tense was used because it reveals general academic facts. [SL3] It was not a new methodology that the authors proposed independently, but rather followed the existing methodology, so I used the passive voice.

Although not as genre-experienced as his seniors working on their own manuscripts, Semu was able to describe the rhetorical functions of the tense and voice as evidenced in his annotations. For instance, he was able to explain the use of passive voice for following a standard method, implying that the active voice is used when the researchers wish to express themselves as the agent who conducted the research in their own particular ways as in "[SL3] It was not a new methodology that the authors proposed independently, but rather followed the existing methodology, so I used the passive voice."

The next example represents the most typical and basic changes that students made at the sentence level, replacing informal word choices with more formal counterparts. As a result, the register becomes more appropriate for the RA genres as can be seen in the excerpt from the final draft of Sutek's, a third-year master student who paraphrased a numerical paper. His initial word choices in the first draft are crossed out and edited in the boldface in his revised draft as in Table 9.

Table 9

Excerpt From Sutek's Draft and Annotation on Word Choices

Final Draft	Annotation
Introduction	[SK1] Used the present tense because it is a fact
The finite volume method (FVM) is commonly used[SK1] for solving flow problems in real life ~~thanks to~~ **because of**[SK2] its robustness and geometrical flexibility. Recently, Barth [1], and Harten and Chakravarthy [2] have successfully established[SK3] some high-order schemes in FVM framework	[SK2] I seem to overuse *due to*, so replaced the phrase with *thanks to*. Does it sound okay? It doesn't sound formal enough for me. [SK3] Used the present perfect for it is a recent previous study

[*sic*] on unstructured grid [*sic*] in order to meet growing demands for more than second-order of accuracy [*sic*].…	
Results	
… It should, however, be noted that the logarithmic plot from Fig.2 ~~tells us~~ **indicate** [*sic*] that high order elements are necessary to obtain an accurate solution in the small region extending up to x/L = 0.01 downstream from the leading edge of the plate.[SK4]	[SK4] Expressions that explain the meaning of the experimental results

As shown in the boldfaced revisions in Table 9, Sutek attended to changing informal word choices to be more formal in general. For example, he replaced *thanks to* with a more neutral expression *because of* and substituted the informal expression *Fig. 2 tells us* with *Fig. 2 indicate*. Aside from the grammatical error of subject-verb disagreement, these revisions imply that Sutek paid attention to the register during the revision process. In particular, the annotation[SK2] that he left questioning the properness of using *thanks to* in Table 9 suggests his incipient awareness of register. After receiving a few alternatives to the phrase in question as teacher feedback (e.g., *because of* for a more neutral voice, *owing to* usually before negative reasons), Sutek later changed his initial word choice *thanks to* to *because of*, which brings a more objective tone appropriate for the RA genre.

Unlike Sutek, however, when teacher feedback was not specified with alternatives for students' informal word choices, most of those students' final drafts did not address word choices inappropriate for the register. For example, Yongbin, a second-term PhD student who paraphrased a model paper, used the word bad effect

instead of *harmful* because "it feels like it causes fatal damage" (first draft annotation). His final draft does not address the informal word choice, which I pointed out to replace with another word in my feedback. Ultimately, he did not address my feedback and kept the sentence the same without any particular annotation explaining the reason: "As large amplitude of incident and reflection wave have [*sic*] a bad effect to [*sic*] a tunnel design, the results of this research could be a good solution" (Yongbin, final draft). This example shows that teacher feedback suggesting concrete plays a direct role in students' writing performance as well as awareness of appropriate registers.

On the other hand, a positive language-level change implying the integration of multiple genre knowledge domains was observed in a genre-experienced student's writing. Sujong, a 3rd-term integrated PhD student who drafted his own manuscript, made more formal word choices in his final draft than the first draft. Table 10 shows the more formal word choices Sujong attended to, which he underlined or boldfaced in his final draft.

Table 10

Excerpt From Sujong's Draft and Annotation on Tone and Formality

Final Draft	Annotation
Results **… Despite the excellent results from the global optimization assisted by Kriging-EI, the huge computational cost and difficulty of parallel computing were revealed as the inherent problem of our method**[SC1] (Step 4: Acknowledging limitations[SC2]). ~~However, regrettably, for the global~~	[SC1] I changed the expression, using a concession clause in consideration of the feedback that the tone of the sentence sounded too strong for the role of the sentence (presenting a limitation of the study). [SC2] Step 4: Acknowledging limitations, I described the limitations (disadvantages) that can be drawn when analyzing the calculation results.

~~optimization assisted by Kriging-EI, the results were excellent, but in terms of calculation time, the inherent problem of our method was revealed, and additional shortcomings: difficulty of parallel computing also appeared in the calculation process~~. Conclusion … For instance, by selecting extremely nonlinear and noisy test function [*sic*] as a target problem, the performance of numerical method introduced in this study is definitely verified in severe conditions, and by reducing assumptions during calculation algorithm, ~~there is no need to doubt~~ **the credibility and accuracy of the solution is [*sic*] also ensured**[SC3].	[SC3] Reflecting the feedback, I deleted the colloquial expressions inappropriate for use in the research article and revised them as the following sentences.

In the excerpt from the Results in Table 10, Sujong acknowledges the limitation of the method used in the study. However, his first draft was written with an inherently negative tone (*regrettably*), improper repeated negations (*However, but)*, and too much emphasis on the limitations of his own study with the word choices and the colon bringing more focus onto the listed limitation (*additional shortcomings: difficulty of…*). Later, Sujong refined the part by reflecting my feedback: "Sounds too strong. How about using a concession clause? *Despite X is Y, Z was revealed to be the inherent problem*." and "If you use a colon to introduce the limitation of your research method, the downside may get too much emphasis" (teacher feedback on first draft). Working as a catalyst, teacher feedback played a role in raising his awareness of using the proper register for an RA and later his performance of writing formal expressions.

In the Conclusion as shown in Table 10, Sujong removed from his final draft the colloquial expression, *there is no need to doubt*, after receiving my feedback, "Very colloquial and strong expression. Alternative: the accuracy of the solution was achieved/guaranteed" (teacher feedback on first draft). Incorporating the feedback, he replaces the informal phrase with the verb phrase *is ensured*, a more genre appropriate word choice. The change of word choice reflects his improved understanding and use of register, facilitated in the process of exchanging memos with the instructor in the form of feedback.

The final example indicates the interweaving of the multiple genre knowledge domains, demonstrated in Duho's drafts and annotations on his intention of employing a rhetorical question. In his earlier annotation on the first draft shown in Table 11, he expressed uncertainty of raising a rhetorical question in a research paper, asking for a second opinion if it would be an appropriate register. After reading teacher feedback, he decided to keep the rhetorical question in his final draft and dropped the pronoun *we*, sounding less informal. Reflecting on his final draft, Duho left an annotation explaining his use of the rhetorical question as signaling the solution for the research question, thus keeping the readers engaged.

Table 11

Excerpt From Duho's Drafts and Annotations on Rhetorical Question

	Draft of Introduction	Annotation
First	Then how could we separate two spray characteristics and investigate for each effect on combustion characteristic [*sic*] of pintle injector?	I intentionally wrote this part in a colloquial style to emphasize it. Does it sound okay?

Final	Then how could two spray characteristics be separated and investigated for each effect on combustion characteristics of pintle injector?	This is a question informing the readers that the solution proposed in this paper will be provided. It serves as an attention getter.

Teacher Feedback on First Draft
If what you mean by "a colloquial style" was a rhetorical question, I think it would be a matter of personal preference: Some reviewers might like it and others may not. I don't think I've often seen rhetorical questions in engineering papers, but sometimes seminal scholars write their papers with a more casual tone as if they were giving a lecture. I personally felt that putting the question at this point was quite original. However, if the subject of the question is "we," the reader may get the feeling of being summoned by the author, so how about writing the question in the passive voice? I also suggest that you look at the trend of using rhetorical questions with the search term *?* in the specialized corpus.

The process leading up to Duho's output in the final draft shown in Table 11 involved the interplay among a couple of genre knowledge domains. First, he had to tap into his formal knowledge for selecting this linguistic device, rhetorical questions, wondering about its appropriateness in the genre, implying initial rhetorical knowledge. He then interacted with the instructor in the form of annotation and feedback for exchanging opinions about the linguistic choice. After better learning about the context and purpose of rhetorical questions, he confirmed his choice of rhetorical question and dropped the pronoun *we* by which he intended to address the readers. He later reviewed his revision and accounted for the intended effect of the rhetorical question he used (rhetorical knowledge) in his annotations. During the process of annotating his own draft reflecting on his textual choices, his metacognition was also presumably at play, thus tapping into genre awareness after all.

Duho's case serves as a good example of integrating genre knowledge during the process of annotating his own writing and interacting with the instructor. This case shows how he used the rhetorical question as a linguistic device (formal knowledge) to express his rhetorical intention (rhetorical knowledge), which was negotiated after all in the process of exchanging opinions via teacher feedback. Consequently, this whole process of interplay between multiple genre knowledge domains fosters Duho's awareness of a more genre appropriate register.

4.2.2. Coherence and Reader-Friendliness

The next sentence-level change made by more than half of the students was addressing the coherence of the text. In this study, improving the coherence in writing was seen as enhanced audience awareness as a result of a positive effect of genre instruction following Yasuda (2011). Also, the students of the present study often referred to coherence as "reader-friendliness (*gadoksung*)" or "how easy [for the readers] to read the sentences and find information from tables or figures" in their needs analysis (Youngsu, Dohoon, and Yongup, among others). Less than half of the students who addressed coherence in writing, however, succeeded in enhancing smoother connections between sentences or paragraphs as shown in Sutek's excerpt in Table 12.

Table 12

Excerpt From Sutek's Drafts Showing Enhanced Coherence

First draft	Final draft
… The "slope limiting" strategy**,** which aims to restrict the deviation of numerical	~~… The "slope limiting" strategy**,** which aims to restrict the deviation of numerical~~

solution, imposes the TVB property of RKDG method. Cockburn et al [9, 10] have recently proposed second-order and third-order operators for RKDG method [*sic*].	~~solution, imposes the TVB property of RKDG method.~~ Cockburn et al [9, 10] have recently proposed second-order and third-order operators for RKDG method**, which aims to restrict the deviation of numerical solution with the "slope limiting" strategy imposing the TVB property.**

Sutek, a 3rd-term master student paraphrasing a model paper, created a better coherence by making connections between the new information, *the "slope limiting" strategy,* and the old information *RKDG method*, which was introduced earlier. In his first draft, his sentence began with the newly introduced information, *the "slope limiting" strategy*, which makes it difficult to process for the readers; in his final draft, he moves the new information towards the end of the following sentence after the previously introduced information "RKDG method" is stated. Considering that this change creates a better coherence of the writing, it makes it easier to process information on the readers' end.

The improved coherence shown in Sutek's writing was seen as contributing to his integrated genre knowledge, providing that changing formal features of the writing to ease the readers' understanding implies the interplay between formal and rhetorical knowledge domains. Among many reasons for making the positive change, following the old-to-new information flow for enhancing coherence could be at play, which was included in teacher feedback on his first draft and also stressed during the instruction when analyzing model texts or critiquing commonly made writing mistakes.

Contrastively, the next example shows a discrepancy between the student writer's intended rhetorical effect and his sentence writing skills. Apparently, Sihun, a first-term master student paraphrasing a model paper, attempted to apply what he learned about varying sentence lengths according to the nature of the information or rhetorical purposes. During the class, students were instructed to write important messages in concise sentences rather than complex sentences for better emphasis. Without understanding that dependent clauses with the subordinating conjunction *because* cannot stand alone, however, Sihun commits a mistake of producing an ungrammatical sentence as shown in Table 13.

Table 13

Excerpt from Sihun's Draft and Annotation on Intended Emphasis

Final Draft	Annotations
Methods	
… An ideal hybrid airfoil design for icing wind-tunnel testing generates[SS1] the same full-scale ice accretion. hybrid airfoils maintain the same leading-edge geometry of the full-scale airfoil and replace the aft section with a redesigned chord which is reduced. Because ice accretions primarily occur on the leading edge[SS2]. The upper and lower leading-edge extents define the portion of the full-scale leading-edge geometry that is maintained in the hybrid design.	[SS1] Since it refers to the characteristics of a general ideal hybrid airfoil, it was generalized using the active voice. [SS2] Since it mentions an important reason, it was emphasized by separating it from the original sentence and writing it in a new sentence.

As shown in his annotation in Table 13, Sihun's intention of curtailing the *because* phrase, presumably mistaking it as an independent clause, was to emphasize the

information in it. This implies that Sihun possibly did not have the basic understanding of the difference between dependent and independent clauses. In fact, examples like Table 13 were not hard to find in other students' writings, not necessarily limited to genre-inexperienced students, which calls for teaching basic sentence writing skills as argued in previous studies on Korean engineering graduate students (Cho, 2009; N. Kim, 2020; Shin, 2015).

The final example demonstrates a possible gap between the intention to revise the text to be more reader-friendly and the actual performance that aggregated the quality of the text. Yongup, a second-term integrated PhD student who was revising his own paper, attempted to better the structure of his introduction, where problems and solutions were alternating in the first draft as recounted in his following annotations:

Excerpt 4.23 The structure has changed from the previous draft. Beforehand, it was written as Problem 1, Solution 1, Problem 2, and Solution 2. However, this composition may make it more difficult for readers to read, as I learned in the class, so I rearranged the organization in the revision by briefly stating the problems and solutions at the beginning, so the readers can anticipate what follows. (Yongup, final annotations)

Consequently, Yongup made 54 removals from the first Introduction and 48 additions to the final Introduction by reorganizing seven paragraphs into two long paragraphs. As can be seen in Table 14, the end results did not seem to meet the goal of a reader-friendly text after all. His plan of providing the main idea at the beginning of

the paragraphs was not realized as the first sentence of each paragraph does not represent the entire paragraph, which, in fact, contains more than one main idea. The two paragraphs contained too many sentences, 17 and 10, respectively.

Table 14

Excerpt From Yongup's Drafts and Aggregated Change of Paragraphing

First Draft	Final Draft
Introduction	Introduction
1 … First, measuring behavior may contaminate the state of bead [*sic*], which is a near-liquid phase to coalesce each other [*sic*]. Therefore, a non-intrusive technique should be used in measuring the early stage of beading. 2 Icing measurement method [*sic*] can be divided into 3D laser scanning, mold and casting, and photographic analysis. However, 3D laser scanning [16, 17, 22] and mold and casting [14, 15] are hard to be applied for this study due to its intrusive nature.; 3D laser scanning can be regarded as an intrusive method because highly reflective material should be applied before scanning [22]. On the other hands [*sic*], photographic analysis [13] is a non-intrusive method and can be used in the present research. However, it also has uncertainty problem [*sic*] that subjective interpretation is involved when the user detects the boundary of microscopic objects [13]. Therefore, the user uncertainty problem should be alleviated to use photographic analysis as a measurement method. 3 In the present study, several efforts were done to solve this problem. First, the experiment was conducted under low-speed icing condition [*sic*] so that the	1 … First, there are difficulties in the data measurements of initial bead growth. As a method to measure accreted ice, three-dimensional (3D) laser scanning, mold and casting, and photographic analysis is generally used. Of these methods, 3D laser scanning [16, 17, 22] and mold and casting [14, 15] methods are categorized as the intrusive methods; 3D laser scanning can be regarded as an intrusive method in that the accreted ice should be coated with highly-reflective paint before scanning [22]. As beads are a near-liquid phase in the early stage of icing, however, intrusive nature [*sic*] of the methods may contaminate the state of beads during measurement. On the other hands [*sic*], the photographic analysis approach is categorized as the non-intrusive method, which does not have any problem to contaminate [*sic*] beads. Therefore, photographic analysis can be used as a measurement technique in the present study. However, a photographic analysis may introduce the subjective interpretation by researchers when detecting the boundaries of microscale objects [13]. Therefore, this user uncertainty problem should be

bead growth proceeded at a relatively macroscopic scale. This is due to the fact that the slower the flow, the larger the critical size [19]. On the other hand, the generality of the results could be complemented by the fact that the droplet growth has a self-similarity [23]. Self-similarity implies that the part resembles the whole so that the drop distribution is the same regardless of scale. Therefore, assuming that the self-similarity characteristic is also applied in the icing environment, the similarity can be expected between different speed condition [*sic*].

4 Also, there are difficulties in data analysis. Data analysis proceeds by presenting the bead distribution with icing variables, which is closely related to the bead growth process. However, it is not an easy task since the bead grows at a different rate along the distance from the stagnation and the distribution pattern changes in the process.

5 In order to simply represent the bead distribution, characteristic parameters concept [*sic*], frequently used in water droplet growth studies, was employed [23, 25]. Characteristic parameters are defined as drop distribution moments. It is well-known [*sic*] parameter that could represent the characteristics of liquid drop growth such as surface coverage and drop distribution [23, 25]. In the present study, the fact that this feature can be applied in the initial bead growth was verified through acquired data, and the parameter was used to simply express the bead distribution.

6 After that, the scaling method [26] was used to obtain the correlation of bead distribution which was represented by the characteristic parameter. Scaling method is frequently used in roughness experiment studies, as an approach to express roughness as an icing variable

considered when using photographic analysis as a measurement method. In this study, a number of approaches were implemented to mitigate this problem. First, the experiment was conducted under low speed icing condition [*sic*] so that the beads grow at a macroscopic scale. This is because the slower the flow, the greater the critical size [19]. Meanwhile, the generality of the results could be complemented by self-similarity, which is a characteristic of droplet growth [23]. Self-similarity implies that the part resembles the whole, meaning the drop distribution is the same, regardless of scale. Therefore, assuming that the self-similarity characteristic is also applied in the icing environment, similarity can be expected between different speed conditions. Second, the image process technique was employed in bead identification to exclude subject interpretation. Detecting the boundaries of beads and calculating bead size and position were conducted by image processing technique (Move3 – Step2: Methodology to reach the purpose of the present study 1).

2 On the other hand, there are also difficulties coupled to [*sic*] the data analysis. In this study, the correlation between the bead distribution and icing variables will be investigated through data analysis. However, this is a complex task, as the beads grow at different rates along the distance from the stagnation point, and the distribution pattern changes in the process. In order to address the problem, the characteristic parameters concept was employed, which is common [*sic*] approach in liquid droplet growth studies [23, 25]. It is well-known that the parameter could represent the characteristics of liquid drop growth such as surface coverage and drop distribution [23, 25]. In the

[11,15-17]. Among them, McClain et al. [16, 17] approach, which is able to express the temporal and spatial evolution of surface roughness, was used in the present study. In the process, the approach was slightly modified to reflect the initial bead growth characteristics of varying surface coverage.

7 In the present study, experimental investigation on initial bead growth and distribution was conducted to provide the physical insights and the quantitative data, which is needed in the modeling of roughness formation. The non-intrusive photographic analysis was selected as a measurement method, considering the near liquid state of the bead. The experiment was conducted under relatively low-speed icing condition [*sic*] in order to compensate uncertainty [*sic*] problem. The obtained bead images were converted into data through image processing code. In the data analysis process, characteristic parameter concept, which was borrowed from droplet growth studies, was used to simply express bead growth properties such as surface coverage and bead distribution. Through the obtained experimental data, it was verified that this concept can be applied for initial bead growth study. Then, the bead properties, which was represented by the parameter, was correlated with an icing condition using the scaling method. McClain et al. [16, 17]'s [*sic*] approach was employed because it is able to express the temporal and spatial variance of roughness. In the process, the approach was slightly modified properly for the present study, and the improvement of the correlation was confirmed. present study, it was verified that this feature can also be applied in the initial bead growth through acquired data, and the bead distribution was simply expressed by the parameter. The scaling method [26] was then used to obtain the correlation of bead distribution. The scaling method is commonly used to express roughness as an icing variable in roughness experimental studies [11,15-17]. Of these, the approach suggested by McClain et al. [16, 17] was used in this study, considering its ability to express the temporal and spatial evolution of surface roughness. In the process, the approach was slightly modified to consider the initial bead growth characteristic, which surface coverage changes continually (Move3 – Step2: Methodology to reach the purpose of the present study 2).

What Yongup could have done instead is to split paragraph 1 into two paragraphs addressing problem 1 and 2 and repeat the same for paragraph 2 to discuss the relevant solutions 1 and 2. This example suggests Yongup's newly noticed reader sensitivity as an important part of genre knowledge was possibly compounded by limited understanding of paragraphing or paragraph writing skills.

4.2.3. Move Structure at the Discourse Level

Compared to the previous local-level changes, discourse-level changes were infrequently observed in students' final drafts. Although all of the students left annotations on their drafts, marking their own intended moves or steps, only a handful of students were able to realize move-level changes. The discourse-level change with the move structure was observed in seven students (i.e., Heetae, Takjin, Juha, Jibum, Dohoon, Yunhoo, and Johan, who made major move-level changes for changing the direction of his research during the term when the study took place).

These students were viewed as having potential for being matured writers compared to those who were limited to making local-level changes in the lexicogrammar. This section portrays representative changes these students made on their move structure at the discourse level, beginning from the example of a basic to a more global change.

The most basic move-level change was found from Juha, a 3rd-term integrated PhD student who paraphrased a model paper without prior publication experience or imminent plans for publishing. He simply added a sentence or paragraph to supplement an insufficient or missing move instead of rearranging moves in a global-level. Table 15

shows an added introductory paragraph at the beginning of Juha's Results and Discussion section.

Table 15

Excerpt From Juha's Draft and Annotation on Added Move

Added Move in Final Draft	Juha's Annotations
Results and Discussion	
The partially premixed flame has it's [*sic*] own unique characteristics. Even many of the contemporary gas-turbines operates [*sic*] in partially premixed state, the study of it is not well confirmed[J1]. This study focused on partially premixed flame configuration with different Re number[J2] [*sic*]. With various measurement [*sic*], the flame was investigated and compared with existing premixed/non-premixed flame experiment results [J3].	The content of move 1 was judged to be insufficient in the previous draft, so this part has been added. [J1] Move 1-3: Justifying study subject. [J2] Move 1-2: Restating study specifics. [J3] Move 1-1: Providing general orientation.

Another case from a genre-experienced group shows a simple paragraph-level improvement contributing to a more organized move structure. A 5th-term integrated PhD student Heetae revised his Introduction, where move 1 *establishing a territory* and move 2 *establishing a nich*e had been muddled in the same paragraph, to attain a clearer move structure. Table 16 displays the rearranged paragraphs in Heetae's final draft, showing a more organized move structure.

Table 16

Excerpt From Heetae's Drafts Showing Organized Move Structure

First Draft	Final Draft
1 In the rocket-engineering field, one of the most important problem [*sic*] is considered to be combustion instability. The combustion instability is the phenomenon where the flame in a combustion chamber becomes unstable due to the interaction among acoustics resonance, heat release perturbation and uneven mass distribution of propellants. This combustion instability can decreases [*sic*] the efficiency of the engine, or even damage the system. 2 Among three factors triggering the combustion instability, the uneven mass distribution stems from atomization and evaporation of propellants; the characteristics of the spray. And the spray characteristics can be influenced by the geometry of the injector. In this [*sic*] reason, several works have been conducted to study the spray characteristics of propellants based on the geometry of the injector. 3 In his book, Lefebvre wrote about the Sauter Mean Diameter (SMD), one of the characteristic parameter [*sic*] of droplet size, using the Rosin-Rammler relationship [1]. When the SMD and the MMD (mass median diameter) of the spray are close to the equality, the spray can be considered to be ideal, where all droplets have the same diameter. Bazarov observed the self-pulsation phenomenon in liquid-centered swirl coaxial injector [2]. Analyzing the tendency of the self-pulsation based on the velocity of the propellants, they confirmed that the minimum velocity of the propellants for self-pulsation became higher as the chamber pressure increased. Park	1 In the rocket-engineering field, one of the most important problems is considered to be combustion instability. The combustion instability is the phenomenon where the flame in a combustion chamber becomes unstable due to the interaction among acoustics resonance, heat release perturbation and uneven mass distribution of propellants. Combustion instability can decrease the efficiency of the engine or even damage the system. Among three factors triggering the combustion instability, the uneven mass distribution stems from atomization and evaporation of propellants: the characteristics of the spray, which can be influenced by the geometry of the injector. (Move1, Step1: Claiming centrality or making topic generalizations.) 2 For this reason, several works have been conducted to study the spray characteristics of propellants based on the geometry of the injector. In his book, Lefebvre wrote about the Sauter Mean Diameter (SMD), one of the characteristic parameter [*sic*] of droplet size, using the Rosin-Rammler relationship [1]. When the SMD and the MMD (mass median diameter) of the spray are close to equality, the spray can be considered to be ideal, where all droplets have the same diameter. Bazarov et al. observed the self-pulsation phenomenon in liquid-centered swirl coaxial injector [2]. Analyzing the tendency of the self-pulsation based on the velocity of the propellants, they confirmed that the minimum velocity of the propellants for self-pulsation became

investigated the static and dynamic characteristics of gas-centered swirl coaxial injector [3]. When conducting experiments with perturbation of gas, he observed an certain [*sic*] instability phenomenon due to resonance in gas feed line [*sic*] as shown in Fig. 1. He defined this phenomenon as "periodic breakup". [*sic*]	higher as the chamber pressure increased. Park investigated the static and dynamic characteristics of gas-centered swirl coaxial injector [3]. When conducting experiments with perturbation of gas, he observed a certain instability phenomenon due to resonance in gas feed line [*sic*] as shown in Fig. 1. He defined this phenomenon as "periodic breakup". [*sic*] (Move1, Step2: Reviewing items of previous researches [*sic*])

In his final draft, Heetae rearranged paragraphs by combining the first two paragraphs dealing with the general topic (move 1), combustion instability, and relocating the last sentence of paragraph 2 in the first draft to the topic sentence of paragraph 3 in the final draft, reviewing previous works done on the characteristics of the spray triggering combustion instability (move 2). By doing so, move 2 establishing a niche begins from a new paragraph, instead of extending over a paragraph dealing with move 1 establishing a territory.

Since the first sentence in paragraph 2 of the final draft (i.e., *For this reason, several works have been conducted*…), introduces several works done in the field, it makes a better topic sentence for move 2 than the original topic sentence (i.e., *In his book, Lefebvre wrote about the SMD*…). Consequently, this paragraph-level revision improved not only cohesion but also the move structure in Heetae's introduction.

A more encouraging change in the move structure was captured in Takjin's drafts. Having written two extended abstracts for international conferences before, Takjin described himself as "a pretty advanced English writer compared to other engineering students," but he still found writing research papers "so difficult no matter

how much I work on it," displaying his frustration (Takjin, mid-term interview). With a goal of submitting his manuscript to an SCI journal, Takjin had roughly drafted his paper over the vacation before the term started, so he could submit his manuscript by the end of the term. When I asked if he made any change in his first draft after learning about the move structure, he described how he changed his Introduction, among many, after realizing that he had written his first draft "indiscriminately" without any "flow" (Takjin, final interview):

Excerpt 4.24 I changed [my draft] a lot. For example, the most important thing in the Introduction is establishing a niche, but that was missing in my first draft. You said that's the most important thing, but the reason why I was weak in that part was because I thought novelty in my paper was weak, so I wasn't confident. So I thought about that part. While doing move analysis, I realized this part was in model papers, and other papers all have the move. They didn't think that the novelty of their work was incredibly good, but they tried to find a gap and present it. It was an opportunity for me to check that out and think about the move [establishing a niche], too. (Takjin, final interview)

As in his testimonial in Excerpt 4.24, Takjin gained awareness of an essential move in the Introduction, *establishing a niche* (Swales, 1990), while doing move analysis, which followed the lecture on move structure and was compared with his groupmates' analyses of different model papers. Consequently, the combination of the

class elements may have brought about the synergy of noticing the new genre feature and applying it to his own writing.

When Takjin's first and final drafts are compared, it is clear to see that the final draft displays improved paragraphing with the added move, *establishing the niche,* which is served by paragraph 4 in Table 17.

Table 17

Excerpt From Takjin's Drafts Showing Improvement by Adding Move

First Draft	Final Draft
Introduction	Introduction
1 Predicting the effects of explosions is an important task for prevention against blast. Characteristics of blast waves in various conditions have been researched by many physicists for several decades. When the impact is externally given to a high explosive, a short reaction zone propagates rapidly (6-10 km/s) due to shock waves generated within the explosive materials. This results in a highly condensed gas with extreme [*sic*] amount of enthalpy. When such a detonation occurs in the air, the hot product gases [*sic*] compress the surrounding air and initially move outwards with velocity similar to that of detonation. The impulsive energy released quickly reaches equilibrium with the environment by the expansion in the air while producing multiple shock waves in the form of blast waves. The blast waves travelling in a space follow a Friedlander waveform: instantaneously increasing to a maximum peak pressure well above the ambient pressure and then decaying exponentially away from the	1 When an impact is externally given to a high explosive, a short reaction zone propagates rapidly (6-10 km/s) due to hot temperature zone [*sic*] behind shock waves generated within the explosive materials. This results in a highly condensed gas with extreme [*sic*] amount of enthalpy. When such a detonation occurs in the air, the hot product gases [*sic*] compress the surrounding air and initially move outwards with velocity similar to that of detonation. The impulsive energy released quickly reaches equilibrium with the environment by the expansion in the air while producing multiple shock waves in the form of blast waves. The blast waves follow a Friedlander waveform: instantaneously increasing to a maximum peak pressure well above the ambient pressure and then decaying exponentially away from the source of explosion. To get the blast wave information such as arrival time and peak pressure etc., previous works in blast wave provided an empirical equation for predicting peak

source of explosion. [1]

2 In addition, when the blast waves contact with [*sic*] the obstacles, reflected waves are generated. The incident blast wave peak pressure can be amplified by a reflection factor which is determined by its own way where the shock wave encounters an object. The reflection factor is generally highest for normal incidence and reduced with the angle relative to incident wave source. As a result of the reflection, the waves finally coalesce and make a third shock wave separated from the wall, which is Mach shock wave. The Mach shock wave propagates faster by [*sic*] the incident wave and finally catches up the original shock front. Through these processes, a high pressure zone is created up to triple point which is a point where the fronts of waves meet. Many theoretical and experimental researches of the wave reflection in various geometric scenarios have been conducted. For example, Baker et al. [2] and Kinney [3] have described the process of reflection in detail. Benselama et al. [4] numerically analyzed the sequence of propagation and reflection of the blast wave in tunnel [*sic*], changing the initial position and aspect ratio of the high explosive. Larcher et al. [5] have adopted a larger scale approach to discuss the impact of blast from high explosive in complex structures such as railway carriages structures. Previously, Clutter and Stahl [6] analyzed the interaction of blast waves generated by explosions in highly complicated configurations and geometries like industrial environments. They proposed a new approach to express explosive reaction source term [*sic*] using enthalpy formulations.

3 In this study, two types of explosive's detonation in different terrains are numerically and experimentally pressure using explosive weight and standoff distance. [1, 2]

2 Additionally, when the blast waves contact obstacles, reflected waves are generated. The incident blast wave peak pressure can be amplified by a reflection factor which is determined by its own way where the shock wave encounters an object. The reflection factor is generally highest for normal incidence and reduced with the angle relative to incident wave source. Because of the reflection, the waves finally coalesce and make a third shock wave separated from the wall, which is the Mach shock wave. The Mach shock wave propagates faster by [*sic*] the incident wave and finally catches up the original shock front. Through these processes, a high-pressure zone is created up to triple point a point [*sic*] where the fronts of waves meet. (Move 1: Establishing a territory, Step 1: giving background fact)

3 Many researches of the blast wave in various geometric scenarios have been conducted. For example, Baker et al. [3] and Kinney [4] have described the process of reflection in detail. Benselama et al. [5] numerically analyzed the sequence of propagation and reflection of the blast wave in tunnel [*sic*], changing the initial position and aspect ratio of the high explosive. Larcher et al. [6] have adopted a larger scale approach to discuss the impact of blast from high explosive in complex structures such as railway carriages structures. Previously, Clutter and Stahl [7] analyzed the interaction of blast waves generated by explosions in highly complicated configurations and geometries like industrial environments. They proposed a new approach to express explosive reaction source term [*sic*] using enthalpy formulations. (Step 1: summarizing previous works)

investigated, 1) a spherical RDX based charge is detonated on the height 1.8m in an open space and 2) a spherical HMX based explosive charge explodes in a 2 room structure. The explosives used in the experiment are the same as the explosives in the Baek et al. [7] The composition and properties of explosives are shown in Table 1. To accurately simulate and predict the effects of blast wave propagation pertaining to specific environments, a large-scale integrated hydrodynamic simulation that can handle very large spatial dimensions is required. For the first case, as short discontinuity from the blast wave spreads out extensively, thus the necessary mesh refinement suitable for blast wave propagation must be considered into one's numerical method. Also for the both case [*sic*], to minimize computational load in tracking interface [*sic*] between hot product gas and ambient air, the integrated equation of state that considers both materials must be developed.	4 In this study, two methods have been devised to accurately calculate the blast wave but reduce the calculation time efficiently. First, as short discontinuity from the blast wave spreads out extensively, the mesh refinement method suitable for blast wave propagation was considered into one's numerical method. Also, to minimize computational load in tracking interface [*sic*] between hot product gas and ambient air, the integration of equations of state for both materials was developed. (Step 2: summarizing methods (gap with the other paper)) (Move 2: Establishing a niche) 5 To validate these methods, the explosions of two types of explosives in different terrains are numerically and experimentally investigated: 1) a spherical RDX based charge is detonated on the height 1.8m in an open space and 2) a spherical HMX based explosive charge explodes in a 2 room structure shown as in Fig. 1, 2. The explosives used in the experiment are the same as the explosives in the Baek et al. [8]. The composition and density of explosives are shown in Table 1. (Move 3: presenting this paper)

To begin with the paragraph-level change, the Introduction in Takjin's first draft initially had three paragraphs, where the second paragraph was lengthy for dealing with two different topics (background facts and previous studies); this paragraph is divided into two in the final draft, thus totalling in five paragraphs showing improved paragraph organization (Table 17). This change suggests that his understanding of organizing information in paragraphs became more solidified as each of his paragraphs represents one topic in the final draft in the end.

When it comes to the move-level change he made, Takjin added an essential move establishing a niche in the Introduction in paragraph 4, following writing conventions in his laboratory. Negotiating between what was learned in the course and what was observed in his model papers, Takjin adopted the strategy of e*xtending previous studies* over pointing out what is *missing or done wrong in previous work*, a widely practiced step in establishing a niche (Swales & Feak, 2012). Takjin explained the reasons as "because [he] was not able to see the part where shortcomings of previous works were presented [to establish a niche] in papers published by [his] laboratory seniors. Instead, [he] briefly introduced distinctive methods used in [his] work for differentiation" (Takjin, annotation on his final draft).

Such strategy is reflected in his word choices in the new topic sentence of the added paragraph 4 in his final draft: "In this study, two methods have been devised to accurately calculate the blast wave but reduce the calculation time efficiently." He opted for adding positive words, such as *accurately* and *efficiently*, to promote his methods as opposed to criticizing previous methods for being inaccurate or time costly.

Takjin's addition of the move is worth noting in that it speaks to interweaving formal and rhetorical knowledge dimensions. First, he based his decision of not criticizing previous works on the fact that he was not able to find such tone in papers written by his laboratory seniors. This can be seen as following writing conventions in his discourse community, which is part of formal knowledge. Next, his careful or respectful attitude towards previous works accomplished by more experienced scholars implies his attempt to avoid face-threatening acts (Brown & Levinson, 1987) while it could be also interpreted as his positioning as a novice scholar, which is a subset of

rhetorical knowledge. When writers "independently reconsider a decision or make a new decision on the basis of evaluating what they have already done," it is seen as a "hopeful sign" of promoting the development of mature composing strategies (Berkenkotter & Huckin, 1987, p. 247). Consequently, the move-level change Takjin made and his rationale behind it are encouraging as they can be seen as heightened genre knowledge, showing an instantiation of the interconnection between formal knowledge and rhetorical knowledge.

Lastly, the most substantial change to the move structure was observed in Jibum's writing. The comparison of his first and final drafts shows a remarkable addition of moves and further examination of paragraphs reveals his polished way of reviewing previous studies in the final draft, "creating a storyline" as what a good introduction entails according to Jibum's remarks from his final interview. A total of 15 removals and 24 additions were detected in the two Introductions, shown in Table 18.

Table 18

Excerpt From Jibum's Drafts Showing Global Change in Move Structure

First Draft	Final Draft
Introduction	Introduction
1 The Hemispherical shell(HS) [*sic*] has long been used for various fields including architecture, engineering, and physics because it produces lower stress concentration under a given investment of materials and maximizes internal volume for a given surface[1, 2]. For the reason [*sic*], vibrations of the perfect shell structure has [*sic*] been studied for a long time. However, reality is a bit more	1 [move1: Establishing the territory] Sphere is one of the ideal shape [*sic*] producing lower stress concentration under a given investment of materials and maximizing internal volume for a given surface [1, 2]. It also has uniform curvature at any point on its surface (step1: Providing general background). For these reasons, the sphere is used in many fields such as condensed matter

complicated. Every structure generally includes imperfections such as small attached or detached fragments, and it is well-known that the perfect shell model is up to several times different from the experiment in practice. It makes a great need to analyze the structures with defects. Therefore, this work presents vibration trends of in-extensional deep shell [*sic*] for the HS model.

2 There are many shell theories to illustrate the linear thin shell, such as Byrne[3], Flugge[4], Goldenveizer[5], Novozhilov[6], and Niordson's shell theories[7] [*sic*]. Among them, Soedel reported that Love's shell theory[8] is relatively practical and simple [*sic*] than the others, which originally neglects transverse shear strains, and consequently shear deflections[9] [*sic*]. This theory treats stretching and bending effects of a shell and is known to fit well with the deep shell. Therefore, Love's approach to the shell with free boundary conditions is adopted in this analysis.

3 Unfortunately, this theory alone is hard to find the explicit solution, except for some special cases… Based on this assumption, Love's theory with free boundaries can be used to describe the local displacement components of the structure of which the detailed derivation is written in Ref. [13].

physics and molecular science to analyze how the curvature affects onto [*sic*] physical properties [3, 4]. Especially in engineering, a wine-glass shell, which is a part of the spherical shell, is more applicable without loosing [*sic*] the advantages of spherical structure because of its inherent high Q-factor [5]. For example, it has been studied as a candidate of micro-electro-mechanical systems (MEMS) devices [6, 7] (step2: Claiming centrality).

2 [move2: Establishing a niche] This axisymmetric structure generally includes defects from small attached or detached fragments to structural faults (step1: indicating a gap). These imperfections cause big differences between theoretically perfect models and experimental data. Rahman et al. presented that the numerical results assuming a perfect micro hemispherical shell can have about 4 % errors between the experimental results even for wineglass modes, in spite of their inherent rejection capacity to the fabrication imperfections [8]... Duwel et al. also argued that the effect of imperfections which is represented by anchor damping in his analysis is an indispensable factor for thermo-elastic damping problems to design MEMS resonant sensors, because of its large contribution on the quality factor [10] (step2: Highlighting a problem). Therefore, there is an increasing need for studying the splitting effect due to the geometrical imperfections (step3: Raising general questions).

3 For example, Wang et al. studied a chemichal [*sic*] etching method to eliminate the split in the hemispherical resonator gyroscope (HRG) because the performance of sensors, which are often used in a navigation system, is

maximized when the frequency split is eliminated [11]...

4 To illustrate the linear thin shell, many theories are established by Byrne, Flugge, Goldenveizer, Novozhilov, and Niordson. Among them, Soedel reported that Love's shell theory [13] is relatively practical and simple [*sic*] than the others, which originally neglects transverse shear strains, and consequently shear deflections [14]. This theory treats stretching and bending effects of a shell and is known to fit well with the deep shell. Therefore, Love's approach to the shell with free boundary conditions is adopted in this analysis.

5 Unfortunately, the theory alone does not give explicit solutions, except for some special cases… Based on this assumption, Love's theory with free boundaries can be used to describe the local displacement components of the structure of which the detailed derivation is written in Ref. [18].

6 After constructing the displacements, natural frequencies of the defect-free shell are obtained from the strain potential and kinetic energies using Rayleigh's quotient [18, 19]. This method gives an exact frequency only if the exact mode-shape is given. However, Love demonstrated that an extension of the middle surface is necessary for the free boundary conditions of structures with rotational symmetry [13]. Fortunately, the extension is negligible in the case of small mode numbers and Soedel presented that the principle at least set an upper limit to the natural frequencies [20].

7 The effect of imperfections has been studied using the perturbation method by many authors. Wedel-Heinen makes a systematic study of vibrations for beams, plates, and axisymmetric shells by handling the geometrical imperfection

	through the perturbation theory with virtual work principle [21]... As a result, the imperfections fix the datum position of the node, which can be denoted as a single parameter, namely a shift angle, and cause a split of the natural frequency in each mode…
	8 At the end of this paper, mode shapes and numbers are obtained for perfect and imperfect wine-glass models. The results are in good agreement with numerical results obtained by a COMSOL MULTIPHYSICS . [*sic*] Split frequencies can be re-merged by adding or reducing small masses at specific points.

In his final draft, he added three more paragraphs (i.e., para. 2-4) for establishing a niche by reviewing previous studies "in an attempt to create a more sophisticated storyline by summarizing more previous studies" (Jibum, final draft annotation). Following his supervisor's advice on including at least 20 citations in the introduction, Jibum added more previous works in this move. A more in-depth review of previous studies found in his revision implies Jibum's added rhetorical and process knowledge possibly through analyzing a good model paper with a clear streamline in the Introduction shown in Chapter 4.1.2 and discussing with his supervisor. As a result, he was able to recontextualize his genre knowledge on intertextuality appropriate to the engineering field.

After presenting a research gap and announcing his current study descriptively in paragraph 3 in the final draft, Jibum added more reviews of previous works, related to the past studies on the methods adopted in his study. As for the rationale for reviewing past methods, he remarked the following: "This may be a part that goes in Section 2

[Methods], but as Section 2 has a lot of formulas, I figured it would not get attention enough. That's why I wrote it in the Introduction in a way to emphasize the justified foundation of this paper" (Jibum, annotation in the final draft). The new organization structure that he devised shows his flexibility of modifying the move structure according to his rhetorical intent considering the field-specific features of presenting numerous formulas in the Methods.

All in all, global changes students made with the move structure in this study were predominantly found in the Introduction section. This lends support to previous findings showing that Introduction was one of the most revised RA sections where the move structure changed by learners in a genre-based writing class (Alinasab et al., 2021). Given that the Introduction is one of the RA sections where the author's rhetoric skills are most required, it is encouraging that these students showed noticeable difference in the moves between their first and final drafts. Moreover, extending the revision from micro to macro level demonstrates their knowledge transformation (Bereiter & Scardamalia, 1987). Ultimately, the transformation of knowledge sets an ideal example of enhanced genre knowledge occurring during the genre pedagogy.

4.2.4. Use of Citations

The last genre-related theme found in students' final written products was their citation practice coupled with understanding of plagiarism and the purpose and rhetorical effect of citations. Although this theme was not prevalent in the cohort, it was deemed noteworthy to report exceptional cases as the understanding of intertextuality and citation practice are an integral part of genre knowledge. Among the ideal examples

of students whose drafts showed changes with regards to citation practice, one case shows heightened awareness of plagiarism, another exhibits an unclear understanding or use of citation types, and the final case implies a more deepened understanding of citation forms and functions.

An ideal example of rectified citation practice following heightened awareness of plagiarism was observed in Siwon's drafts, where multiple citations were added with the proper in-text citation notation in his last draft. Siwon is one of the students who submitted three drafts, showing considerable addition and change from his first draft to the last. Not only did he add more examples of previous works in the move structure where previous works are reviewed in the Introduction, he gradually added proper in-text citation notations at the end of the cited works on his later drafts.

In his first draft, he only wrote one paragraph realizing the move of reviewing previous research as in Excerpt 4.25:

Excerpt 4.25 In order to reduce this resonance phenomenon, several researches on flow characteristics in the cavity and flow control techniques were done by many researchers. However, unsteady flows, including moving objects such as internal store separation, still have a lot of difficulties. (Siwon, first draft)

In his second draft, Siwon added 12 sources in ten more sentences over two paragraphs, improving the move reviewing previous works, which shows more content and rhetorical development. Yet, there is still room for improvement on properly citing findings from other sources in the text, where some in-text citations were missing. His

final draft reflects Siwon's refined practice of citation as the properly notated in-text citations are added after presenting specific numerics from factual information and findings that were not from his own study. The relevant sentences are underlined and the added in-text citations are bold faced in the following Excerpt.

Table 19

Excerpt From Siwon's Draft Added With Proper In-Text Citations

Second Draft	Final Draft
Introduction	Introduction
1 Since the mid-1950s, interest in installing stores inside aircraft was increased [*sic*] with the development of supersonic aircraft. The importance of internal store [*sic*] has been increased as the installation of external store [*sic*] causes drag and aerodynamic heating of up to 30%. … A resonance occurs in open cavity [*sic*] by this unstable feedback. 2 The cavity flow characteristics were studied by experiments of Rossiter [5], Heller [4] , and Krishnamurty [6]. Afterwards, open cavity flow characteristics were revealed through numerous experiments and numerical analysis, and flow control studies were conducted to suppress this unstable flow. In particular, Rossiter and Heller suggested that the dominant oscillation changes by mode depending on the flow structure and flow conditions.	1 Since the mid-1950s, interest in installing stores inside an aircraft was increased [*sic*] with the development of supersonic aircraft. The importance of internal store [*sic*] has been increased as the installation of external store [*sic*] causes drag and aerodynamic heating of up to 30% **[1]**. ... A resonance occurs in **an** open cavity by this unstable feedback **[2]**. 2 The cavity flow characteristics were studied by experiments of Rossiter **[3]**, Heller **[4]**, and Krishnamurty **[5]**. Afterwards, open cavity flow characteristics were revealed through numerous experiments **[2,7]** [*sic*] and numerical analysis**[9.10]** [*sic*], and flow control **[6,8]** [*sic*] studies were conducted to suppress this unstable flow. In particular, Rossiter **[3]** and Heller **[4]** suggested that the dominant oscillation changes by mode depending on the flow structure and flow conditions.

In his final third draft, Siwon added four in-text citations accurately [1-4], and new references with proper in-text citations [6-10], which indicates the development of his process knowledge over time. One thing notable in the added in-text citations is, though, that he did not attend to the order of reference numbers when adding new references. The citation numbers should follow the order of appearance in the manuscript according to major engineering journals (e.g., IEEE, AIAA). Aside from the numbering order of the in-text citations, Siwon's writing generally showed improved practice of citation.

Siwon's progress in citation practice, in fact, was preceded by discussion on the standard of citing during his mid-term interview. Siwon raised a question about the standard of plagiarism, which was rather unclear for him because "some examples from published papers that [he] read did not cite certain methods from other works" (Siwon, midterm interview). In his Introduction, Siwon wanted to point out a weakness of a method that was once discussed in another paper, but was not sure if it was necessary to cite the source "because the point made was from the Introduction, not the findings of the study, which one usually cites" (Siwon, midterm interview). I advised him to cite the source if the idea is not his own, and by doing so more credibility could be added to the point that he wanted to make in line with previous discussion on the weakness of a certain method. Following the midterm interview with the instructor were more in-text citations added in the Introduction of his final draft, displaying his heightened awareness of plagiarism and citation facilitated by mentoring interaction.

Not an ideal yet interesting case of changing citation type was found in Sujong's Introductions, which show changes from integral to non-integral citation with an

unexpected reason explained in his annotation. In class, the students learned about the different effects of using two types of citations. That is, integral citations are used for placing emphasis on the researcher while non-integral citations bring more focus on the research. Sujong's annotation on the change of citation types, however, does not seem to reflect any intended effects of citation types as shown in Table 19.

Table 20

Excerpt From Sujong's Draft and Annotation on Change of Citation Type

Final Draft	Annotation
Introduction	
… In the computer based numerical optimization method[SC8] , every optimization process including initial DOE planning, mathematical calculation, geometrical deformation and optimal shape selecting was conducted based on numerical algorithms by using automatic computing devices. ~~According to the previous research conducted by Henderson et al[3], Yi and Yim et al[1,2],~~[SC9] **Since shortcomings of the existing old design method relied upon manpower were cured [1,2]**[SC10] , [*sic*] nowadays engineers can obtain much accurate and consistent results in a shorter time [1].	[SC8] Step2: Making topic generalization [SC9] I deleted [the researchers' names], thinking there was no need to write an additional phrase "according to." That's because the "since" clause explaining the reason comes afterwards, [and since clauses are] where old information that the reader already knows is presented first. Also, I immediately added in-text citations [at the end of the sentence]. [SC10] Step3: Reviewing items of previous research

In his first draft, Sujong initially used an integral citation (i.e., *According to the previous research conducted by Henderson et al[3], Yi and Yim et al[1,2]* [*sic*]) to begin reviewing items of previous research after making topic generalization as noted in [SC8]. The reason for changing the citation type to non-integral in his final draft given in [SC9] ,

however, does not relate to any rhetorical effect of the revised citation type; instead, Sujong was more focused on presenting old information after the *since* phrase, which begins the sentence. This example suggests that Sujong may not be fully equipped with employing citations with a clear purpose of their rhetorical effects in the text.

Although different uses and effects of integral and non-integral citations were introduced during the instruction, they might not have been precisely noticed or internalized by students in general. The fact that not many examples showed diverse citation types or relevant comments explaining the rhetorical effects in students' artifacts is in line with previous findings showing limited citation types adopted by non-native speaker novice writers (Mansourizadeh & Ahmad, 2011; Thompson & Tribble, 2001).

The final examples representing proper citation use were found in Jibum's annotated texts. Although it was the annotations that were added to the final draft, with no change in the text per se, the added annotations were deemed worth the attention as they reflect his clarified awareness of citation use. Table 20 shows one annotation from the Introduction and another from the Methods in Jibum's final draft, showing his attention to citation use and its rhetorical effect.

Annotation[JL1] from Jibum's Introduction in Table 20 reveals his attention to different citation forms (i.e., *written in Ref. [18]*) that he noticed from his model papers, and how he applied it to his own writing. This kind of observation was not recorded in other students' artifacts, which makes Jibum's notice of citation forms outstanding.

Table 21

Excerpt From Jibum's Draft and Annotations on Citation Effects

Final Draft	Annotation
Introduction	
… The only choice is the bending approximation proposed by Lord Rayleigh, assuming that the model is in-extensional, which can be used when the transverse wavelength is much smaller than the surface dimensions [17]. Based on this assumption, Love's theory with free boundaries can be used to describe the local displacement components of the structure of which the detailed derivation is written in Ref. [18] [JL1]...	[JL1] In general, when adding a citation, it often ends with a [#] after a sentence, but I found that the expression "write (deserved) in Ref. [#]" was used more directly [in the model paper] when the content or value was actually used in the paper. Although detailed derivation is not in this paper, a more direct citation was made because the results will be taken from the source as they are.
Methods	
… According to Fox [24], the imperfections specify radial anti-nodes (orientation of a given mode), which can be represented as shift angles, Z, so the displacements are expressed as X equals Y [JL2].	[JL2] I have seen many times that the justification of an RA was solidified by citing a seminal scholar's paper, and that strategy was used here.… I wanted to emphasize Fox's theory as much, so I kept the phrase "according to" in front of the sentence instead of putting it behind.

Annotation[JL2] from his Methods also indicates his sensitized awareness of citation use and rhetorical effects, using citations to justify or solidify the legitimacy of the method used in his study. Although it may not have occurred to other students to annotate what they are aware of citation practice or forms, the fact that Jibum voluntarily verbalized in the annotation what he noticed makes him a more attentive, if not advanced, learner with regards to noticing and performing genre features in writing.

Although not all students were able to perform what they had noticed and verbalized in their genre analysis tasks, the general changes made on their texts were sentence-level revisions addressing lexicogrammar for more appropriate register and more reader-friendly coherence. A few students who wrote their own drafts and made discourse-level revisions with the move structure and citation practice needed more skillful use based on clearer understanding of the rhetorical effects of different citation types. Given the nature of writing, however, students' knowledge may not lead to immediate writing performance within a short period of time (Bereiter & Sacrdamalia, 1987) as much as they noticed genre features.

CHAPTER 5. PERCEIVING GENRE PEDAGOGY

This chapter summarizes students' overall perception of the given genre pedagogy by reporting the final survey results (Section 5.1) and illustrates learners' pains and gains in the genre pedagogy extracted from the qualitative data, student interviews and final reflection notes triangulated with the responses to the open-ended questions in the final survey questionnaire (Section 5.2).

5.1. Learners' Perception of the Genre Pedagogy

The main purpose of administering the final survey was to obtain students' evaluation of the main class elements of the given pedagogy in assisting their genre knowledge of research articles and English writing skills. The questionnaire consisted of 34 Likert scale items ranging from 1 (not helpful at all), to 2 (somewhat helpful), to 3 (pretty helpful), and to 4 (very helpful). To avoid any possible confusion from the descriptors, the students were advised to assume that the four scales have an equal gap between one another.

This section outlines the results from the final survey questionnaire relevant to the research questions by question types. The results from the 4-point Likert scale questions and the germaine open-ended responses are reported by three genre knowledge domains under examination (Section 5.1.1) and perception on students'

English writing skills (Section 5.1.2). Next, the open-ended responses to the most and least favorite parts of the pedagogy are summarized in Section 5.1.3.

5.1.1. Genre Knowledge Development

In an attempt to provide a more concrete idea of what denotes genre knowledge in the survey, the variables were divided into formal, rhetorical, process, and subject-matter domains of which the first three were subject to analysis in this study. All interconnected to one another in nature, each of the three genre knowledge domains were presented in the survey into three sub-elements, respectively, following Tardy's (2009) model for a more in-depth analysis. Under each of these variables listed three major class components subject to evaluation: 1) model paper analysis and group discussion (MG), 2) self-annotated writing (AW), and 3) online feedback (OF), which includes teacher feedback, similarity checker, and automated grammar checker provided on Turnitin. The entire raw frequency and descriptive statistics of the 4-point Likert scale data from the final survey results of 35 respondents are provided in Table 21.

To highlight noteworthy results, the overwhelming majority of the students found online feedback pretty helpful (22.9%) or very helpful (65.7%) for learning about the drafting and revising process, totalling 88.6%; lexicogrammar pretty helpful (34.3%) or very helpful (42.9%), amounting to 77.2%; and prototypical forms or writing conventions pretty helpful (42.9%) or very helpful (34.3%), adding up to 77.2 % of the respondents. Another well-received class component was self-annotated writing, which the majority of the learners evaluated as pretty helpful (65.7%) or very helpful (31.4%)

for understanding move structure, equalling 80%, and drafting and revising pretty helpful (34.3%) or very helpful (42.9%), corresponding to 77.2 % of the respondents.

Table 22

Raw Frequency and Descriptive Statistics of the Final Survey Results (Q1-27)

N = 35

Variable	Class Element	Likert Scale (%)					
Formal Knowledge		Not Helpful	Somewhat Helpful	Pretty Helpful	Very Helpful	Mean	SD
Prototypical Forms and Writing Conventions	MG	3 (8.6)	16 (45.7)	14 (30)	2 (5.7)	2.43	.739
	AW	0	10 (28.6)	17 (48.6)	8 (22.9)	2.94	.725
	OF	0	8 (22.9)	15 (42.9)	12 (34.3)	3.11	.758
Moves and Steps	MG	4 (11.4)	15 (42.9)	12 (34.3)	4 (11.4)	2.74	.651
	AW	1 (2.9)	6 (17.1)	17 (48.6)	11 (31.4)	3.09	.781
	OF	3 (8.6)	8 (22.9)	15 (42.9)	9 (25.7)	2.86	.912
Lexico-grammatical Features	MG	2 (5.7)	15 (42.9)	12 (34.3)	6 (17.1)	2.63	.843
	AW	2 (5.7)	6 (17.1)	17 (48.6)	10 (28.6)	3.00	.840
	OF	3 (8.6)	5 (14.3)	12 (34.3)	15 (42.9)	3.11	.963
Sum		18 (6)	89 (28)	131 (42)	77 (24)	2.88	.432
Rhetorical Knowledge							
Dynamics of Persuasion	MG	8 (22.9)	17 (48.6)	7 (20.0)	3 (8.6)	2.14	.879
	AW	2 (5.7)	11 (31.4)	12 (34.3)	10 (28.6)	2.86	.912
	OF	3 (8.6)	13 (37.1)	14 (40.0)	5 (14.3)	2.60	.847
Sense of Audience	MG	8 (22.9)	17 (48.6)	7 (20.0)	3 (8.6)	2.14	.879
	AW	6 (17.1)	17 (48.6)	7 (20.0)	5 (14.3)	2.31	.932
	OF	8 (22.9)	10 (28.6)	12 (34.3)	5 (14.3)	2.40	1.000
Positioning as Author[a]	MG	3 (8.8)	18 (52.9)	8 (23.5)	5 (14.7)	2.37	.942
	AW	2 (5.9)	10 (29.4)	13 (38.2)	9 (26.5)	2.77	1.003
	OF	5 (14.7)	9 (26.5)	14 (41.2)	6 (17.6)	2.54	1.039
Sum		45 (13.0)	123 (38.1)	104 (32.2)	51 (15.8)	2.46	.597
Process Knowledge							
Drafting/Revising	MG	8 (22.9)	12 (34.3)	10 (28.6)	5 (14.3)	2.34	.998
	AW	2 (5.7)	6 (17.1)	12 (34.3)	15 (42.9)	3.14	.912
	OF	0	4 (11.4)	8 (22.9)	23 (65.7)	3.55	.701
Intertextuality	MG	7 (20.0)	20 (57.1)	5 (14.3)	3 (8.6)	2.11	.832
	AW	1 (2.9)	16 (45.7)	10 (28.6)	8 (22.9)	2.71	.860
	OF	5 (14.3)	17 (48.6)	9 (25.7)	4 (11.4)	2.34	.873
Exchanging Ideas	MG[b]	1 (2.9)	8 (23.5)	12 (35.3)	13 (38.2)	3.00	1.000
	AW[c]	9 (27.3)	9 (27.3)	8 (24.2)	7 (21.2)	2.26	1.221
	OF[d]	10 (30.3)	12 (36.4)	7 (21.2)	4 (12.1)	2.03	1.098
Sum		43 (13.9)	104 (33.54)	81 (26.1)	82 (26.5)	2.61	.509

Note. Model paper analysis & group discussion (MG), Self-annotated writing (AW), Online Feedback (OF), including teacher feedback, similarity checker, and automated grammar checker provided on Turnitin.

[a - d] Incomplete responses were treated as missing data and excluded from the calculation, resulting in the following case numbers: positioning as author[a] (n = 34), MG[b] (*n*=34), AW[c] (n=33), and OF[d] (n=33)

None of the respondents found teacher feedback and self-annotated writing not helpful in terms of learning about prototypical forms or writing conventions, a subset of formal knowledge. The rank order of the helpfulness of the class components provided by the 35 respondents is presented in Figure 8.

Figure 8

Helpfulness of Class Components (N = 35)

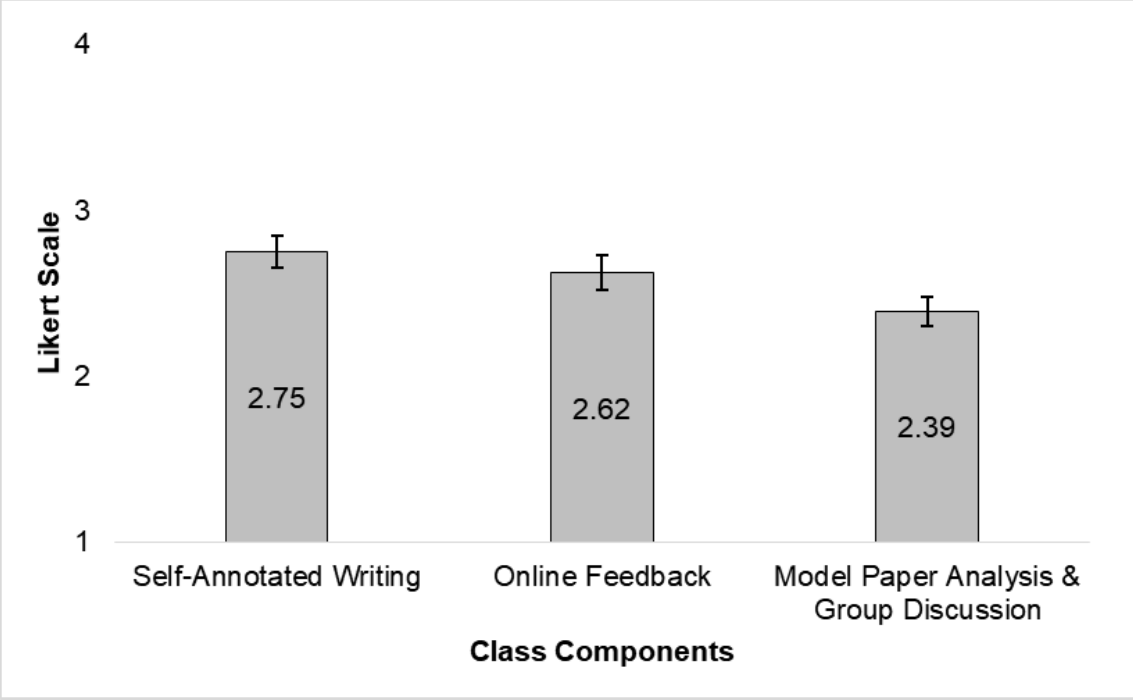


Figure 8 compares the averaged mean scores of the three class components that the respondents rated on their helpfulness of developing genre knowledge on a 4-point Likert scale. Among the three major class components, self-annotated writing received the highest mean score ($M = 2.75$, $SD = .582$), followed by online feedback ($M = 2.62$, $SD = .608$), and model paper analysis and group discussion, coupled as one interconnected component ($M = 2.39$, $SD = .509$).

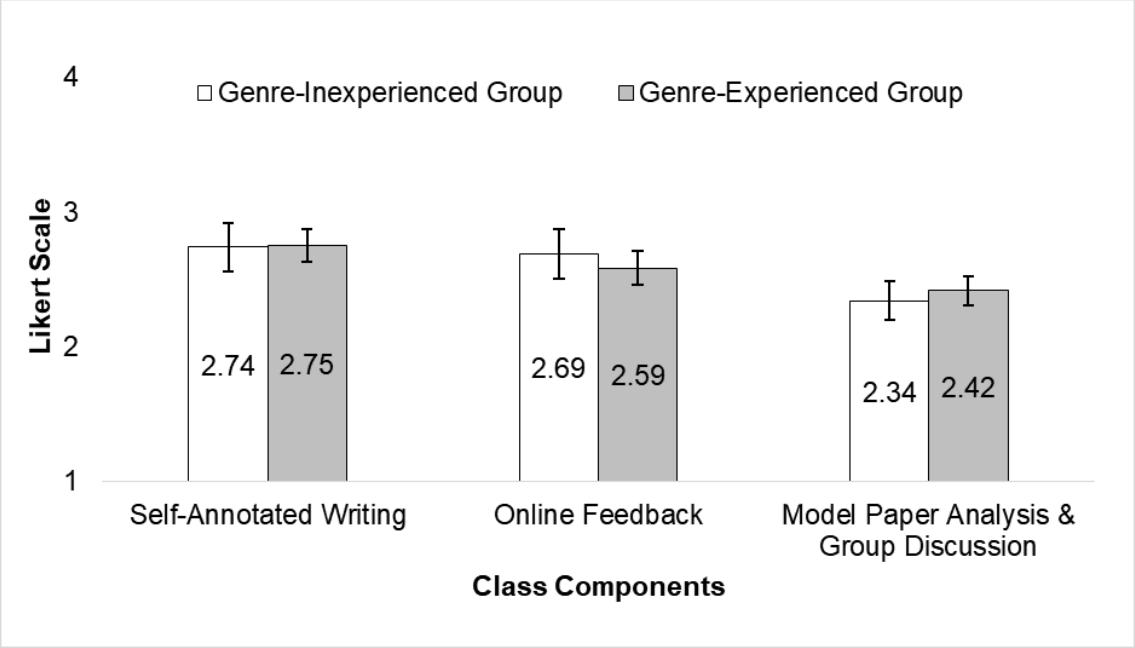
To note any statistically significant difference among the means of the three class components, a one-way repeated measures ANOVA was performed. As a result, there was a statistically significant difference among the three mean scores [$F(2, 68) = 5.955$, $p = .004$]. According to the post hoc comparisons using the Bonferroni adjustment, the mean score of self-annotated writing ($M = 2.75$, $SD = .582$) was significantly higher than that of model paper analysis and group discussion ($M = 2.39$, $SD = .509$, $p = .004$). The difference between the means of self-annotated writing and online feedback was not statistically significant ($p = .494$). Neither was the difference between the means of online feedback and model paper analysis coupled with group discussion ($p = .193$). The results suggest that the students perceived that self-annotated writing was more helpful than the class component of model paper analysis and group discussion.

When the mean scores of the class components were compared by two student groups, the genre inexperienced ($n = 12$) and experienced ($n = 23$), the rank order of the class components remained the same as in Figure 9. Both student groups rated self-annotated writing the highest and the model paper analysis and group discussion

component the lowest, implying that students' prior genre experience was not at play when it comes to valuing the helpfulness of the class components.

Figure 9

Helpfulness of Class Components by Students' Genre Experience

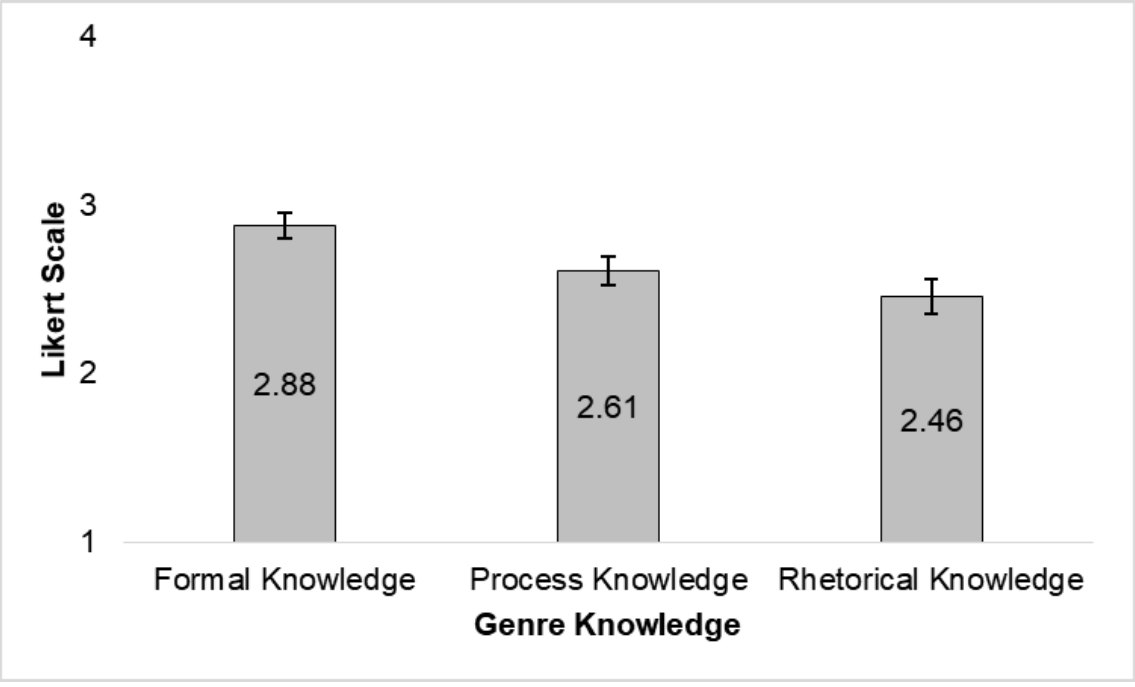


As Figure 9 shows, self-annotated writing was rated virtually the same by both the genre-inexperienced group (M = 2.74) and experienced group (M = 2.75) while the component of model paper analysis and group discussion was rated slightly higher by the genre experienced group (M = 2.42) than the genre inexperienced group (M = 2.34). When it comes to online feedback, the genre-inexperienced group gave a higher mean (M = 2.69) than their counterparts (M = 2.59).

To compare students' perceived development across genre knowledge domains, the mean scores of the three sub-elements under each of the three genre knowledge domains were averaged. Figure 10 exhibits the descriptive statistics of 35 respondents, indicating that the genre knowledge domains evaluated as most developed are formal knowledge (M = 2.88), followed by process knowledge (M = 2.61) and rhetorical knowledge (M = 2.46). This order is in line with the rank order that the students needed assistance most in the needs analysis conducted at the beginning of the course, which suggests that the genre pedagogy under evaluation was perceived to meet students' needs after all.

Figure 10

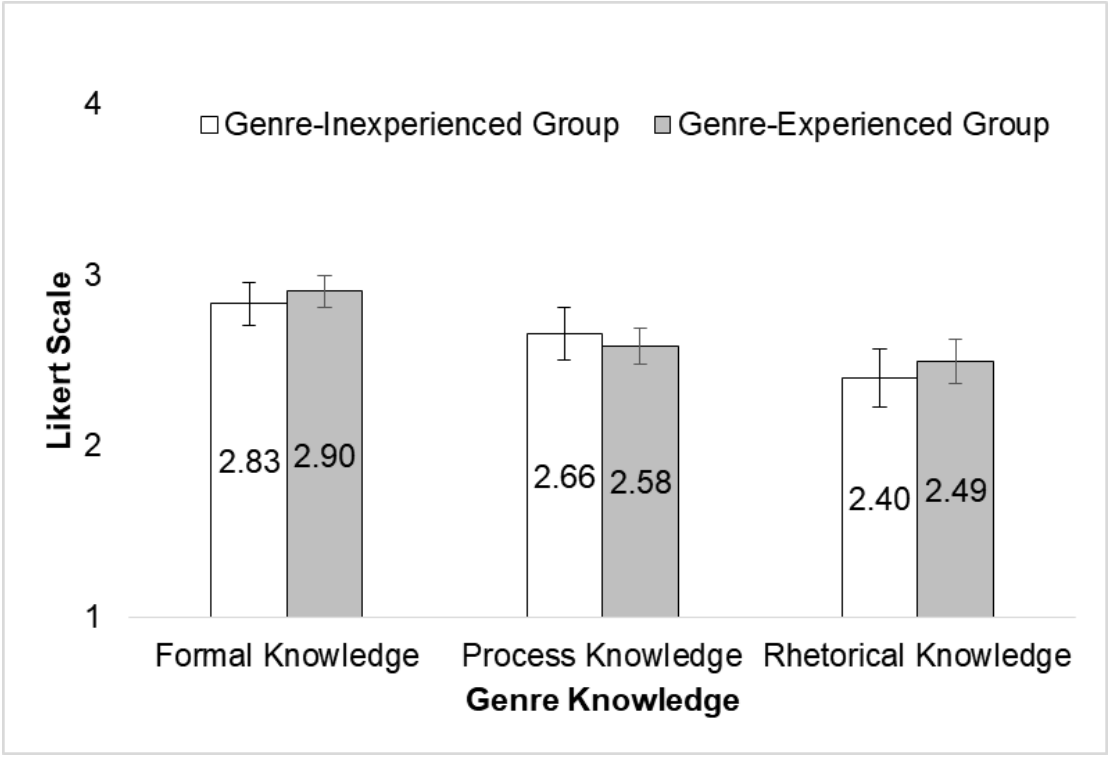
Perceived Genre Knowledge Development With Class Elements



To compare the difference among the means of the three genre knowledge domains, a one-way repeated measures ANOVA was performed. The results indicated that there was a statistically significant difference among the mean scores of the three genre knowledge domains [F (2, 68) = 13.472, p = .001]. Post hoc comparisons using the Bonferroni adjustment revealed that the mean score of formal knowledge (M = 2.88) was significantly higher than those of process knowledge (M = 2.61, p = .001) and rhetorical knowledge (M = 2.42, p = .001). The difference between the means of process knowledge and rhetorical knowledge was not statistically significant (p = .256). The results suggest that the students perceived that their formal knowledge was assisted by the genre class components more than their process knowledge or rhetorical knowledge.

Figure 11

Perceived Genre Knowledge Development Across Genre Experience



When the means of the three genre knowledge domains were compared by students' genre experience, the rank order remained identical between the two groups as can be seen in Figure 11. Once again, prior genre experience was not a factor when it comes to the overall rank order of students' perceived genre knowledge development. As much as formal knowledge was ranked the highest, followed by process knowledge and rhetorical knowledge, formal knowledge (M = 2.90) and rhetorical knowledge (M = 2.49) were rated slightly higher by the genre-experienced group while process knowledge received a somewhat higher mean score (M = 2.66) by the genre-inexperienced group on a 4-point Likert scale.

Based on the above major results, the following sections report in more detail about the interplay between each genre knowledge domain and three class components by supplementing respective Likert scale results with their follow-up open-ended responses. Each section depicts the class components that particularly assisted the formal aspect of genre knowledge (Section 5.1.1.1), process domain (Section 5.1.1.2), rhetorical dimension (Section 5.1.1.3) and their reasons why provided by the students. The sections are presented in the order of genre knowledge that received the highest averaged mean scores according to the presented final survey results.

5.1.1.1. Formal Knowledge

Among the three genre knowledge domains, formal knowledge was rated the highest when the mean scores of the 4-point Likert scale were averaged. For an in-depth analysis, formal knowledge was presented in the questionnaire as comprising three elements, following Tardy's (2009) framework. When the mean scores of the three

subset elements were averaged, the results show that the 35 respondents, after excluding one missing data, perceived that their formal knowledge was developed most in the order of 1) lexicogrammar, 2) writing conventions, and 3) move structure.

Figure 12

Perceived Formal Knowledge Development Across Class Elements

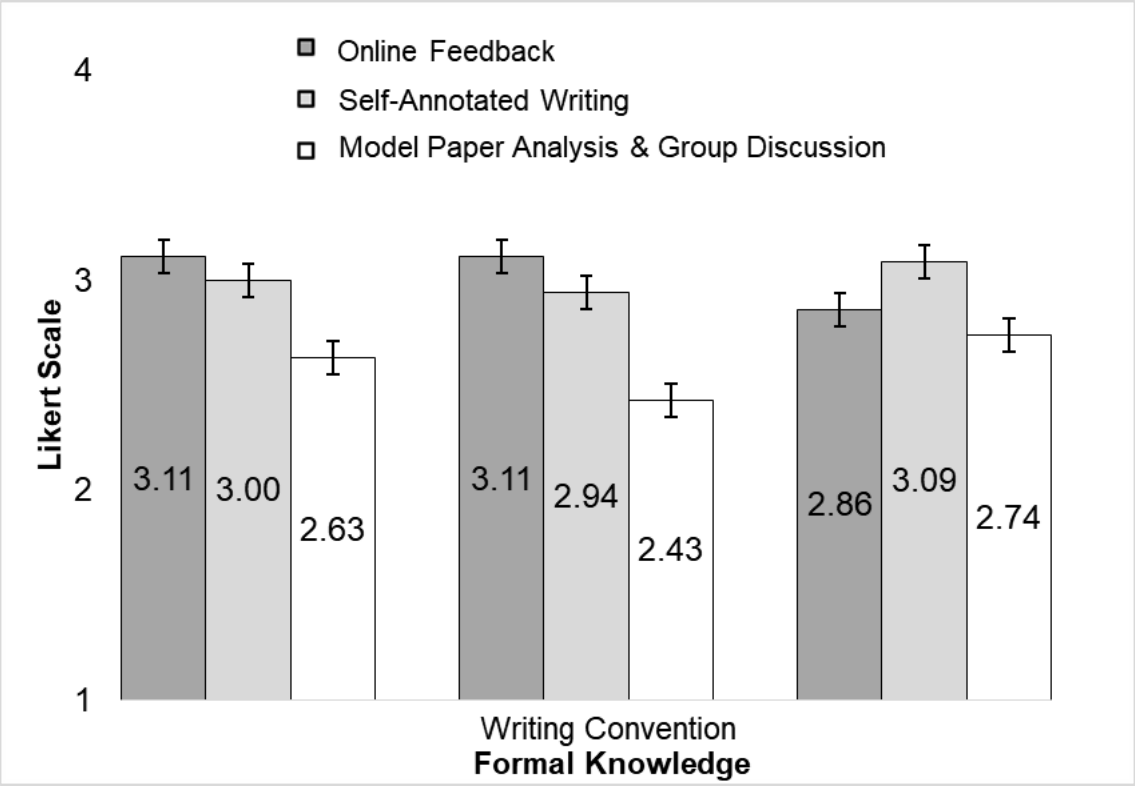


Figure 12 shows that two class elements that received the highest mean scores on average are online feedback and students' self-annotated writing. Online feedback received the highest averaged mean scores for assisting students' lexicogrammar (*M* = 3.11) and understanding of writing conventions, prototypical forms and norms (*M* =

3.11). Self-annotated writing received the highest mean score of 3.09 for its utility of understanding move structure.

Among the reasons for selecting lexicogrammar assisted pretty and very much given by students who specified their reasons included learning new or frequently used vocabulary in model papers (n = 9), applying the learned features in actual writing practices on their own (n = 5), and detailed teacher feedback, which complemented the blind spots from a non-engineering perspective (n = 5).

5.1.1.2. Process Knowledge

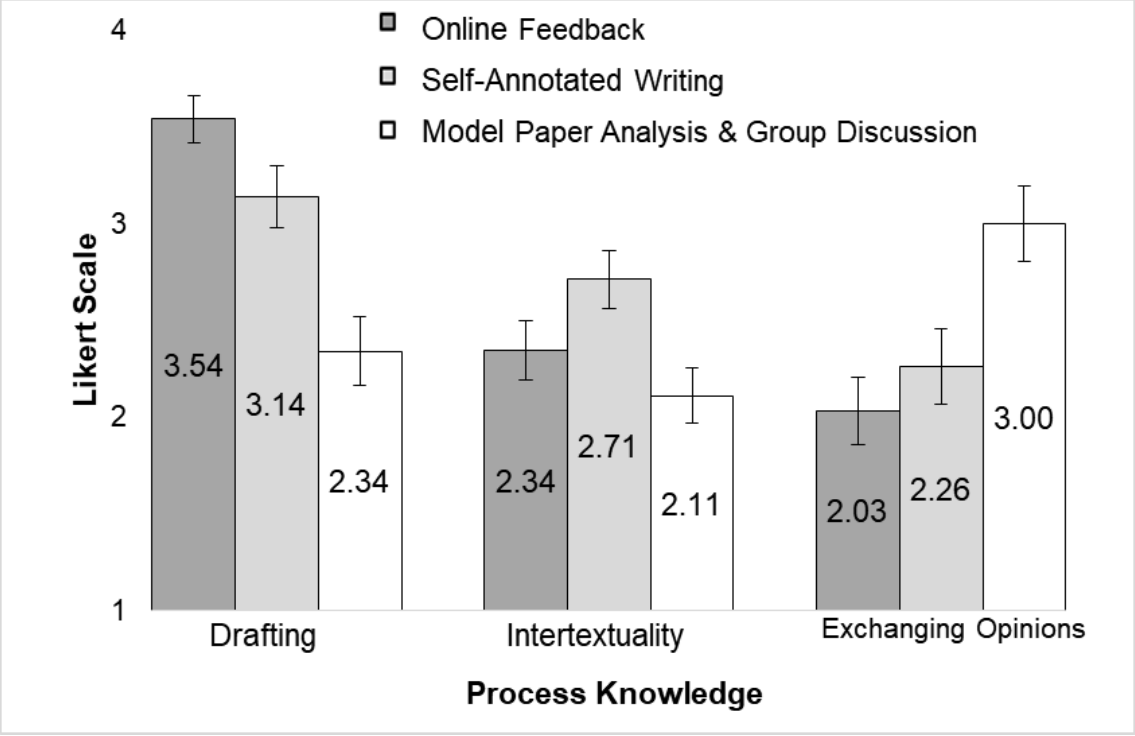
Following formal knowledge, process knowledge received the second highest averaged mean score, which means that students perceived it as the second most assisted genre knowledge by the class components. The three class components perceived to broaden students' process knowledge are reported in the order of the highest mean scores on a 4-point Likert scale: 1) drafting or revising process, 2) understanding intertextuality, and 3) exchanging ideas with peers or mentors. Figure 13 compares the averaged means of the three class components rated as having assisted the development of the three sub-elements of process knowledge.

As depicted in Figure 13, knowledge of the drafting process shows overall high mean scores across three class components. The class component that received the highest mean score was online feedback (M = 3.54) for sensitizing students' knowledge of the drafting process. The next highest mean score was given to self-annotated writing for assisting the drafting process with the mean of 3.14. It is noteworthy that the class component of model paper and group discussion received its highest mean score of 3.00

for assisting students with exchange of opinions across all genre knowledge sub-domains, presumably attributed to the clear nature of sharing opinions in group discussion.

Figure 13

Perceived Process Knowledge Development Across Class Elements



The major reasons for finding online feedback and self-annotated writing pretty or very helpful in the drafting or revising process were because these components enabled the respondents to identify their own problems. Representative comments on online feedback were “I was able to identify areas of improvements and problems based on the feedback received” (Sangho) and “It was helpful because I can directly receive comments about the parts that are confusing and difficult” (Sojin). Realizing one’s own

issues in writing was also reported in a comment on self-annotated writing as in “By writing it myself, I found out what the problem was in my writing” (Sihun). Another comment addressed the usefulness of applying the learned lesson during the self-annotated writing: “I was able to think about applying what I had learned to writing my first draft” (Sangho).

An interesting comment reflected that awareness of intertextuality was possibly raised by paying more attention to a particular section where intertextuality is most required: “I spent a lot of time adding references when writing the Introduction” (Sooil). In a similar vein, another reason for rating self-annotated writing positive was because “I learned the necessity [of intertextuality] by actually constructing the logic of my paper” (Juwoon). These comments echo students’ appreciation of applying lessons learned firsthand, which is an overarching theme found in evaluating self-annotated writing in general.

Lastly, there was a noteworthy student comment explaining why the component of model paper analysis and group discussion facilitated their exchange of ideas, which went, “I was able to confirm that there was a difference [in papers] by comparing Moves and Steps” (Takjin). This comment illustrates the learning outcomes of reading papers followed by comparing the variations in groups.

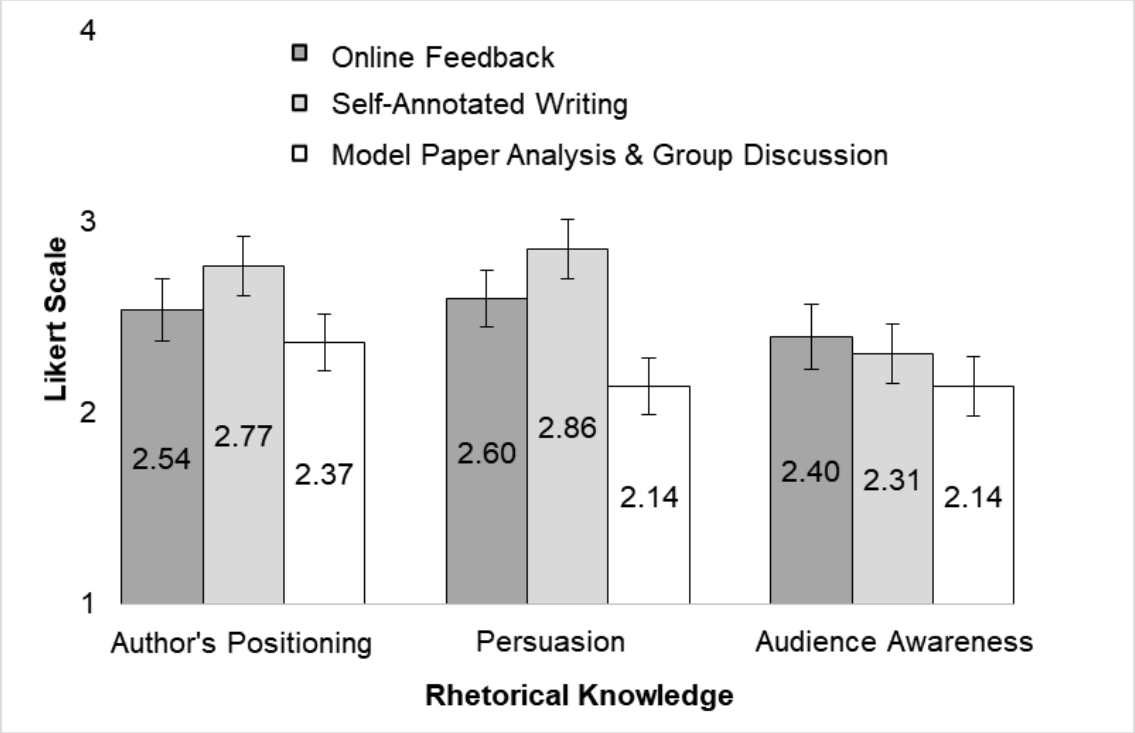
5.1.1.3. Rhetorical Knowledge

The results of the 4-point Likert items on how students’ rhetorical knowledge was assisted revealed that the highest rated sub-elements in order are understanding 1) how to position one as an author, 2) dynamics of persuasion and purpose of the genre,

and 3) audience awareness. Figure 14 shows how the three class components are perceived to develop each sub-element of rhetorical knowledge.

Figure 14

Perceived Rhetorical Knowledge Development by Class Elements



As shown in Figure 14, the class element showing the highest averaged means under the overall rhetorical knowledge is self-annotated writing. The class component ranked the highest for assisting learning about dynamics of persuasion (M = 2.86) and positioning as an author (M = 2.77) while online feedback ranked the second with the means of 2.60 and 2.54, respectively. When it comes to audience awareness, however, online feedback received a higher mean (M = 2.40) than self-annotated feedback (M =

2.31). The element of model paper analysis and group discussion was ranked the lowest with the mean of 2.14 for assisting audience awareness.

Major reasons why self-annotated writing aided students to understand positioning as an author were as follows: “I was able to be in the position of the author [while doing this activity]. I was able to learn what expressions to use and what not to use when addressing the author” (Imju) and “My understanding [on positioning] increased by reviewing [my draft]” (Wusung).

In terms of understanding the dynamics of persuasion, the next highly rated subset of rhetorical knowledge, the main reasons why self-annotated writing was rated positively was attributed to contemplating the structure for persuading readers during their writing (n = 3). The relevant comments read, “I was able to think about how to structure sentences and the text so that readers can easily understand them” (Heetae) and “I have come to explore ways to better write with purpose and persuasiveness when structuring my paper” (Sihun). One of the reasons for giving positive scores to online feedback was because “[I got] my paper evaluated on whether the purpose of writing was well reflected (Heetae) and “I could realize the importance of the old-to-new info flow firsthand [by writing myself]” (Sojin).

In promoting a sense of audience, however, the majority of the respondents did not give any of the three class elements more two highest scores than the two lower scores. The main reasons why some respondents did not give any of the two high scores to gaining their sense of audience were reflected as difficulty in gaining the knowledge or gauging their development. Such comments include, “It was a little difficult to review from the author’s point of view to understand the reader’s point of view” (Yongbin), “In

fact, I didn't have much motivation to think about the audience. I wrote [my draft] with the idea that my supervisor would see it" (Sooil) and "I couldn't feel a big change or insight gained. However, by looking at the [teacher] comments, the reader's existence was once again reminded" (Sojin).

5.1.2. Perceived Change of Genre Knowledge and Writing Skills

In the final survey, students were also asked to rate the extent of any change in their perception of genre knowledge, writing skills, and writing English research articles by the final week. By the end of the 15-week course, the respondents perceived that their genre knowledge changed most, giving a mean score of 3.21 on a 4-point Likert scale. Following genre knowledge was writing skills with a mean of 2.85. Perception of writing English RAs received the lowest mean score of 2.58. The comparative mean scores are depicted in Figure 15 with error bars.

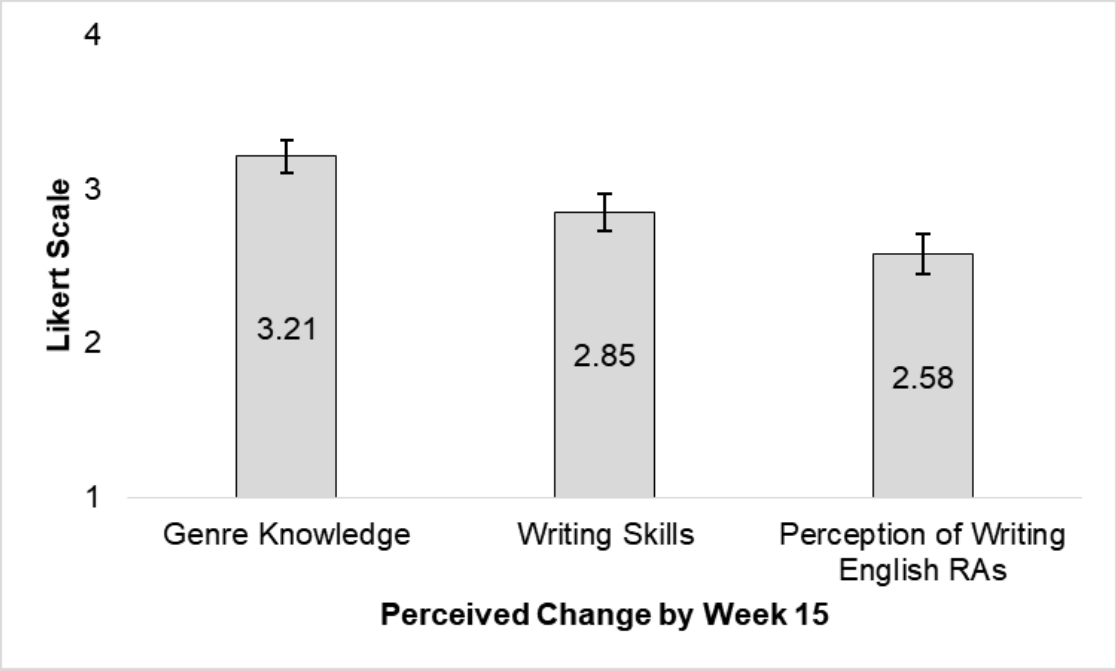
It is noteworthy that genre knowledge received the highest mean score 3.21 for changing by the end of the genre pedagogy where building students' genre knowledge was at the heart. The main reasons for perceiving their genre knowledge developed were attributed to gaining more formal knowledge, namely the move structure or the main components (n = 6) and lexico-grammatical features of research articles (n = 2). An exemplar of student comments accrediting move structure lessons reads, "I was able to figure out the move or step structure and write a research article based on that" (Jihan).

Other reasons for perceiving their genre knowledge as improved were attributed to the grammar lessons given to better their understanding of the intended communicative purposes. For instance, there was a comment on the use of voice, which

was taught for making emphasis properly, as in "grammar lessons, including voice and detailed nuances, were helpful" (Yongbin). Another comment from a genre-experienced student encapsulates how the respondent modeled some essential vocabulary after model papers as a reference and internalized the expressions after all: "By borrowing the necessary expressions from model papers and writing them in my own paper, I was able to see how what I want to express are written in English." (Siwon).

Figure 15

Perceived Changes in Genre Knowledge, Writing Skills, and Perception of English RAs



The major reasons for perceiving that their writing skills improved were more or regular writing practice (n = 3) and expanded vocabulary (n = 2) and grammar (n = 1). The significance of regular writing practice is well reflected in the comment, " [My writing skills improved very much because] I got accustomed to writing and using more

English due to regular assignments" (Siwon). These results speak to the needs and necessity of regular writing practice for L2 students (Min, 2017).

Meanwhile, a few students displayed careful or skeptical attitudes towards seeing their writing skills very much improved as in "I wonder how much my writing has improved from an objective view point" (Sooil) and "my writing skills are not good enough yet" (Yongbin), and "due to not actively participating in class activities [, my composition skills did not change]" (Jongyun).

Lastly, respondents displayed split opinions on any change of their perception of writing English research articles. Comments reporting positive change in their perception of writing English research articles were mostly made on understanding the structure of research articles. Some comments implied the presence of awareness of the research article structure: "I got to learn about the need for having a major structure (move or step) in research articles (Wusung)," and "[I think my perception is changed] because I learned about the structure of an English research paper" (Sangho). Other comments expressed appreciation of obtaining guidelines and confidence in gaining a systematic approach on writing research articles as in "what I like most is having an overall guideline" (Siwon) and "I can approach [research article writing] from a systematic perspective" (Sutek).

On the other hand, some of the respondents who did not view their perception changed very much commonly shared a sense of difficulty of writing English research articles: "There seems to be no change in the fact that writing a research article in English is difficult (Jihan)" and "[Writing an English research article] seems more

difficult than I thought. It feels like the blurry wall of writing research articles has become clearer (sobbing).” (Sikyong).

Interestingly, one comment described with excitement how the sensed difficulty of writing English research articles changed over the course of analyzing model papers and utilizing an introduced corpus search tool: “I vaguely thought writing an English research article would be difficult, but that changed because I got to learn about the power of sentence composition by [referring to] various model papers and learned how to use programs like AntConc!” (Sunkil). Apparently, Sunkil’s excitement of searching for good sentence structures from model texts to adopt to his own writing echoes a previous finding that EFL learners who were instilled in the “observe-and-borrow mentality” (Kennedy & Miceli, 2017, p. 111), which is to look for lexical chunks that they could adopt in their own writing when concordancing corpora, appreciated and enjoyed concordancing corpora more. Sunkil’s comment is also in line with a previous finding showing that L2 writers’ anxiety can be relieved while self-efficacy promoted when online writing aid tools, such as AntConc, are provided in addition to teacher feedback (Min, 2017).

5.1.3. Evaluation of the Pedagogy

The last question in the final survey was an open-ended question asking about the respondents’ favorite part of the class and any areas of improvement for the future class. Most of the comments on the favorite parts of the class addressed feedback, making up 31% of the total comments. In addition to one comment appreciating the similarity checker on Turnitin, the rest of the comments were on teacher feedback.

When it comes to the type of teacher feedback, the respondents found those direct, detailed, and in flow with the draft particularly helpful (e.g., “It was good that the instructor tried to give detailed feedback. It was of great help in writing the research paper” (Yongup), “It was very helpful to receive comments and corrections in line with the flow of my writing” (Johan).

The second highly spoken part of the curriculum was hands-on writing experience (24 %). More than half of these comments appreciated the actual writing practice through regular assignments. In particular, one of the comments valued the bi-weekly writing assignments as “[I liked the] fact that I was able to write on my own through constant assignments given on a regular basis” (Sooil). This may reflect the needs of practicing writing in an EFL setting, where not only input but also output is substantially deficient. Another comment recaps the strengths of the curriculum as follows: “It was nice to have the opportunity to write in English and to get feedback on it. It was also useful to know about tools that can be used in the future, such as AntConc” (Jukyong). This comment suggests that it may be of help to introduce learners to a specialized corpus as a long-term writing aid tool for those who are interested.

Next, 20% of the comments on the favorite part of the class were about gaining insights into research articles. A representative comment on learning about an approach to writing research articles with a structure goes, “I learned that there is an academic approach to writing research articles and the formal format of the writings used in research articles” (Jitak). Other comments cherished learning about the structure of research articles as “When writing an English research article in the future, I think I can

organize the structure well from the beginning" (Yongbin). To those with or without research findings to write about, the curriculum apparently gave an overview of writing research articles: "Although I have no research results, I was able to get a rough idea of how to write an English thesis in the future" (Jihan). "It was an opportunity for generally overviewing English writing and reviewing my research article again" (Jinwoo).

Other respondents remarked on the lecture, instructor, and curriculum as their favorite parts of the class. With regards to the lecture, a few comments noted the usefulness of learning about the move structure (e.g., "The summary [of the essential moves and steps] given at the end of the semester helped organize my scattered knowledge (Siwon). Some comments appreciated the efforts to customize the class for the learners by interacting with them: "I liked the instructor's interactions with students, and appropriate review" (Sikyong). "I could feel and appreciate the instructor's passionate lecture, warm heart, and consideration. It was a good time to become more familiar with writing" (Sunkil). The following comment encapsulates the overall evaluation of the class: "It is very helpful if you catch up with the lectures, lecture materials, writing process, and the overall curriculum (Dohoon)."

While the learners valued teacher feedback, actual writing practice, and heightened awareness of writing structured research articles, they commonly addressed the areas of improvement for the class as the heavy workload, model paper analysis, group discussions and the target learners.

The most prevalent comments were made on the heavy workload as the curriculum required the students to read and analyze a model paper or two by move

structure, discuss their analyses in group, and apply the learned lessons to their writing assignment to receive feedback. By the end of the term, students were asked to submit a final portfolio, compiling all of their works with a brief reflection note, as a means of reviewing and reflecting on their works done throughout the term. This compiling and reviewing process seemed to take more time than expected as in the following comments: "...it was very cumbersome to have to review, collect, and submit all the assignments, other than my drafts... As an end-of-semester assignment, I think the final writing assignment and reflection paper (1 page) would be good enough" (Jukyong). Necessary process to see one's own growth, reflecting on their own work did not seem to appeal to some students. Another comment also expressed preference of the writing activity over others as in "I think it would have been better just to write other than doing other activities" (Wusung).

The class activities building up to the writing activity were pointed out as the next areas of development in the final survey. In particular, the model paper analysis task was challenging to some respondents due to varying move structures in papers: "... due to diversity in each paper, it was sometimes vague on how to apply the move structure to my model paper" (Johan). Variation in the move structures by field also seemed to get in the way of the group discussion, which is well captured in the following comment: "Just a note rather than an area of improvement, there were, unfortunately, many cases in which discussions were not conducted well due to the different research areas of each individual" (Sooil).

Finally, respondents with less research experience expressed difficulty or frustration of not being able to take the full advantage of the entire curriculum. One

respondent commented that “depending on the proficiency and status of the students, it seems that the burden felt by students for the tasks would be different” (Sumyung). There was a more critical comment on behalf of those without any research data to write about as follows:

> Excerpt 5.1. In particular, in the case of writing a whole research article from the beginning, I think it will be very helpful for students who are actually writing their own papers, but for those who are not, I don’t think it is a task that they can learn from greatly. (Yunhoo)

One of the challenges for those who paraphrased a model paper was dealing with higher similarity rate as they were able to check it on Turnitin before final submission:

> Excerpt 5.2. Clear cutline for similarity [rate is] necessary [as the] task I carried out was reconstructing the model paper, but there were cases where the similarity rates were high due to words or expressions that were already standardized and difficult to change. Taking this into consideration, it would be better if the students are given a clear similarity rate limit. (Jihan)

Although the task was expected to raise their awareness of plagiarism, the inevitable use of keywords and technical terms naturally raised the similarity rate, which in turn made them feel anxious without a clear-cut similarity rate as a limit.

All in all, not all of those who paraphrased their model papers appreciated the writing assignment because it was not as authentic as writing their own manuscript and it was not easy to navigate the task without keeping the similarity rate low as they wished. One of them expressed the pity of not having research results to write about and the desirable time of taking the class as when one is ready to publish their own finding:

> Excerpt 5.3. It would have been better if I had taken the course at a time when I could actually publish my research. If this lecture is held next year, I would like to receive feedback on my research article by sitting in the class. (Sunkil)

These student comments speak to the significance and necessity of providing customized curriculum based on the learners' individual circumstances and needs. Apparently, the efforts put into satisfying different student demographics by implementing multiple, flexible class elements were found to be somewhat cumbersome or unorganized for students. The curriculum, however, was designed with the best intentions to encompass different student groups considering the challenging setting where the class demographics ranged from first year master students to doctoral students in their final years.

5.2. Learners' Pains and Gains in the Genre Pedagogy

In an attempt to probe into the students' own experience with the genre pedagogy, each class element was analyzed based on students' comments from the

midterm and final interviews and final reflection notes, crystalized with their final survey results whenever necessary. Overall, students' preferences for class elements differ by individual characteristics, learning styles, and the point of time in their programs. The findings are reported in the order of the sequence that occurred in the cyclical curriculum: the lecture, model paper analysis, group discussion, self-annotated writing, and teacher feedback.

5.2.1. "More samples of model analyses" vs. "More grammar lessons"

The triangulated data showed conflicting preferences over what the students needed more during the lecture. While some students wanted to see more demonstrations of analyzing model papers, others wanted more lecture time on grammar and vocabulary. Interestingly, the priorities for the lecture, however, were placed on grammar and vocabulary, writing practice, and the move structure of RAs based on the needs analysis conducted at the beginning of the course.

Aside from grammar and vocabulary, those who were not familiar with move analysis would have benefited more from seeing more analysis samples. A first-term master student with less genre experience, Sihun, found that the demonstrated samples in class were "really short, but [his model paper] was really long," thus merely "[getting] the hang of it" because [the demonstration of model paper analysis] was not as detailed as "sentence-by-sentence analysis," in which he was engaged for his model paper analysis (midterm interview). To ensure sufficient lecture time on lexicogrammatical features in RAs, however, no more time was spared on modeling the deconstruction of model papers in minute detail or across all fields when time did not

allow. Instead, I shared in my lecture slides the presentation slides of analyzed model papers from the previous year and also posted previous students' works on the online class board for students' reference. Consequently, the students' shared comments served as a great reminder of the significance of deconstructing model papers in class as much as possible or in more detail.

The difficulty in analyzing moves could have multiplied when the terms of the move structure were unfamiliar for some students. One participant shared his constructive criticism and suggestions for future lectures on the move structure:

> Excerpt 5.4. I think there's a little problem with the terms, moves and steps themselves. I was thinking if using different terms would help students understand the concept better. I think the terms need to be changed to something that the students can relate to. Personally, it would have been better to bring the theory in Korean language. Because in Korea, there is definitely a writing course in the high school curriculum. The writing process theory is very systematic, and if you are a student in a top-tier university, you would have taken the class. Actually, the course is called *Hwajakmun*. It's about speech, composition, and grammar as far as I know. If you could draw on the Korean writing theories or terms and explain the similarity or differences between the Korean and English terms, like this Korean term means this English term or if you could compare the differences between English papers and Korean papers, it would give us a familiar ground to start with and be more helpful. (Duho, final interview)

It is worth noting that what Duho suggested speaks to the dynamics between genre knowledge and genre awareness. Drawing on pre-existing knowledge in L1 (genre awareness) is known to facilitate the understanding of the same or relevant genre in L2 (Cummins, 2000; Gentil, 2011; Tardy et al., 2020). His comments indeed provide food for thought that genre awareness in L1, which develops across languages, could play a critical role in facilitating the understanding of L2 genre knowledge of multilingual genre learners.

On the other hand, some of the students who had not taken proper academic writing classes before appreciated learning about grammar lessons on confusing grammar points:

> Excerpt 5.5. It was my first time learning about English composition properly, and it was very good that I was able to learn and actually apply English grammar (e.g., difference between *which* and *, which* / the use of articles), which was my very weak point. I was able to learn more because it did not end with a one-way learning, but it was a class where I had to actually use and think a lot about what I learned. (Jibum, final reflection notes)

One of the most frequently made mistakes by the students were the use of articles and punctuation. Thus, it was necessary to give lectures on the two areas, in particular, and students like Jibum might have benefitted from clarifying their understanding in the lecture, applying them in writing, and receiving feedback to verify

his use. As a result, Jibum also shared during his final interview that he “referred to the lecture slides a lot when drafting [his] paper.”

Those who were not most favorable to unconventional class activities, such as group discussions, expressed their preference over sparing more time on lecture, so they could learn about something they could directly utilize in their writing. Such opinions were not confined to a specific group of students. One of the critical participants voiced his opinion on replacing group discussion with grammar lessons, and even pop quizzes, by venting his frustration of struggling with English grammar after serving in the military for a few years, as opposed to those who were able to study English as professional researchers “replacing their military service as some male students in college of engineering or natural sciences do” (Duho, final interview):

> Excerpt 5.6. But for those who served in the military like me, even if they learned English before or used to be good at English, if they haven’t used English for a long time, and they’ve been using English by just doing simple readings and everyday conversations, their English gets very poor in terms of grammar. So I'd rather focus on grammar lectures at the beginning of the semester [if I were the instructor]. For example, you know, instead of group discussions and the weird program, AntConker [AntConc], I think it would be better if you just gave a grammar lecture and replaced assignments with grammar quizzes. I think the quiz would be much more helpful (Duho, final interview).

Hearing about the frustration of having limited English grammar, indeed, was saddening and also disheartening as an instructor who attempted to juggle lexicogrammar lessons with move structure analysis, added by the workload of providing individual feedback to more than 30 students biweekly over 15 weeks. This rather acrimonious student comment speaks to less advanced EFL learners' desperate needs for basic grammar or sentence writing skills as their first priority.

5.2.2. "Hard to find a good paper" vs."Modeling after good papers"

As shown in the final survey results (Section 5.1), model paper analysis was not the most favorite class component, divided in evaluations. For one, most of those who found the model paper analysis challenging struggled with selecting the right papers from the beginning; some did not see value in analyzing model papers by the move structure. Those who selected good papers benefitted from analyzing model papers, which served as a guide for writing their own.

A root cause underlying the difficulties for students to analyze model papers was reported to be selecting inadequate model papers for the analysis task. The paper selection issue was recurrently brought up in students' comments. For example, Sangho analyzed a paper recommended by his supervisor, but it was difficult to analyze because the terms were too difficult to understand. There was a limit to the analysis because "it was so technical that I had to read several other papers to understand one term or formula" (Sangho, midterm interview).

Apparently, the idea of asking their senior mentors or supervisor for recommending an ideal paper to analyze (Cheng, 2018) did not work for this group of

students. Even if they did, certain engineering papers were too technical to even understand the basic terms and follow the flow of the papers for first-term master students like Sangho.

Although given on the course syllabus as long as a month prior to the beginning of the course, the criteria for selecting good papers did not seem to allow finding proper papers. Apparently, some students found the criteria as restrictions, rather than guidelines for selecting proper model papers. For instance, it was not easy for Siwon, a third term master student, to find recent papers from the last ten years relevant to his research topics. He eventually selected those not closely pertinent to his own paper. Clearly, model paper analysis did not serve its purpose when he was analyzing the ones not directly related to his research topics. Instead, he referred to "seminal works published more than ten years ago because it was more helpful" (Siwon, midterm interview).

These student comments indicate that there is a need for giving more lenient criteria for selecting model papers for students' analysis purposes. As much as the intent was to provide a clear criteria for selecting model papers, more flexible criteria (e.g., allowing RAs read before as model papers) may better serve novice genre learners given the technicality of engineering papers, which are often not reader-friendly for novice genre users.

In fact, it would be ideal if the class could select a common RA for the move analysis assignment as in Juwoon's comment, "I wish you had selected the model papers for us to analyze." With the diverse field variation, however, it did not seem to be practical or beneficial to select one model paper for all students to analyze as their

assignments. In the prevention of any issues with their model papers, students were also given a chance to change their model papers at the beginning of the course with a brief reason for doing so. Some did while others did not for reasons like “because I’ve already read that much. Actually, when I first read the model paper, I read the whole thing. And that’s what you naturally do, you know.” (Duho, midterm interview).

The trouble with selecting model papers to analyze possibly led to a series of difficulties in the following stages in the pedagogy to some students, especially those in their early terms of the program.

Some students viewed analyzing move structure as something not necessary to learn explicitly but implicitly acquired as the course of nature as shown below:

> Excerpt 5.7. Honestly, it was less meaningful for me to mark moves and steps in the model papers than receiving teacher feedback. [What I learned from] teacher feedback was direct and relatable, but I wondered if it was necessary to consciously understand and annotate the moves and steps in your model papers when it can be understood subconsciously**.** (Wusung, final interview)

Analyzing move structures before comparing them across fields was designed as part of a genre awareness raising task, but interestingly, genre awareness by nature was viewed as something learned implicitly rather than explicitly by some students in their later terms. Another third-term master student revising his manuscript shared his view on how he had gained awareness of the RA genre. From his experience, master students in their first term do no know much about research papers, but that part of their understanding on move structure “gets filled naturally over time…in a few semesters or

at least a year, [they]'ve read a few papers, so it's fair to say that the structure of academic papers is acquired by then" (Duho, final interview).

According to the students, the third term in their master program seems to be when they engage in maximal academic activities, which provide opportunities to raise genre awareness in their discourse community. Siwon, in his third-term of a master program, reflected on his experience as "I think I'm getting more and more understanding by reading a lot of more papers and giving brief presentations at conferences, which eventually seem to promote my understanding of the RA structure" (final interview). Given such circumstances, it is worth discussing whether there is a threshold or an optimal time for learners to undertake genre analysis tasks for maximum synergism between genre knowledge fostered in the classroom and genre awareness gained in the authentic context outside the classroom.

Conversely, those who selected good model papers for analysis not only showed heightened genre knowledge (see Chapter 4.1), but also positive evaluation of the move analysis task. For example, Sutek, a third-term master student who paraphrased a model paper, was able to "specifically see what moves should be included in each part and how they were organized" after reading his model paper five times, including three times before the course (final interview). As a result, Sutek completed a quality writing task, paraphrasing his model paper (excerpts can be found in Chapter 4.2). In addition, those who drafted their own papers, such as Siwon, a third-year master student who revised his manuscript, were able to "refer to model papers whenever faced with difficulty writing sentences" (Siwon, final interview).

Other reasons why other students found model paper analysis helpful was because it was part of their duty as graduate students. Analyzing RAs as a class assignment was a good motivator for these students to analyze a research paper in depth. Sihun, a first-term master student paraphrasing a model paper, used to "only read the conclusion section of research articles before" (midterm interview), while Duho, a third-term master student revising his own work, find the task "effective because it is something we needed to do anyways and the assignment nudged us to do it harder" (final interview)

The model paper analysis task made some students realize the difference between Korean and English RAs and refer to their model paper analysis for their own writing. Yongjin, a third-term master student drafting his own manuscript, called the experience of analyzing a model paper "beneficial in itself," realizing that "there was a difference in expressive, discursive aspects between Korean and English papers" (midterm interview). Consequently, those who benefitted from analyzing model papers were able to "model after [their] model papers for writing" as Siwon reflected as one of the improvements he made in the course by the end of the term.

The overall comparison between those who selected proper model papers and those who did not give rise to the essentiality of selecting well-written model papers. Given the benefits reported by students who selected proper model papers, it once again calls attention to the quintessence of selecting well-written model papers as the first step to the genre analysis to play its part in heightening learners' genre awareness.

5.2.3. “When we have the same level of knowledge” vs. “Absorb seniors’ knowledge”

Group discussion was one of the least favorable class components to this cohort depending on grouping. Those grouped with other inexperienced genre users seem to have a harder time comparing various move structures across fields while those grouped with more experienced students were able to reap the benefit of learning about field-specific features across move structures as an effective way to raise genre awareness.

In particular, first-term students who did not have a more experienced genre user in the group were not able to maximize their learning in the zone of proximity (Vygotsky, 1978). For example, Sihun felt that they all had “the same knowledge level, so it was not as helpful for learning than other activities” (midterm interview). In the event of not having any experienced genre learner in the group, the students were encouraged to select papers written by their laboratory seniors or advisors, so that they were able to discuss with the authors any unclear rhetorical intent or strategies employed. Some of those who selected model papers written by their lab seniors, however, were not always in contact with them in reality as in the case of Heetae, a fifth-term integrated PhD student.

Among those who found group discussions helpful, one common ground was that they had a more experienced genre user in their group. Sangho, a first-term master student paraphrasing a model paper, seemed to have benefitted from group discussions with seniors:

Excerpt 5.8. I have no background knowledge about RAs because I am in the first semester of my master's, but the group discussion was helpful because you can absorb your seniors' knowledge there. At least when it comes to the fact that my understanding of RAs itself has improved. (Sangho, final interview)

When asked to list the most helpful class components, Jihan put group discussion as the first element:

Excerpt 5.9. I think the most helpful activity for me was group discussions. Well, I'm not in the stage of writing a research paper because I'm still in my second semester. Also, I'm not doing my research yet, so I think group discussions helped me the most in understanding how papers are organized and vocabulary used in other fields rather than drafting a paper (Jihan, final interview).

Appreciating group discussions, both Sangho and Jihan succeeded in completing quality group discussion reports, which were submitted after each group discussion session. For instance, Sangho learned about characteristics of RAs in a specific academic journal, which was shared by his laboratory senior in the group. Jihan also worked in a group of different research methods, and comparing and contrasting diverse move structures with his groupmates seemed to heighten their genre awareness across research methods (See Chapter 4 for the analysis of their excerpts).

5.2.4. “Just to complete the assignment” vs. “Chance to evaluate my own writing”

Self-annotated writing was one of the class components that the students appreciated most along with teacher feedback. Although some of the unmotivated students did not utilize the chance to reflect on their own writing or exchange ideas with the instructor by leaving questions in their annotations, most of the students shared positive views on the activity as a way of identifying their own writing issues or thinking about the rhetorical functions of their own sentences.

For some students, however, leaving annotations on their own writing felt like “forcing [myself] to leave annotation just to complete the assignment” as Sangwu, a third-term master student who paraphrased his model paper, commented during his midterm interview. Given that he worked on paraphrasing a model paper, it could have been less meaningful for him to reflect on the rhetorical intent underlying certain moves or lexicogrammatical features, which are already arranged by the original author. As another student who paraphrased his model paper recollected his self-annotation experience, “If you wrote [your own draft], you’d remember the sentences and you could write something like that [, annotations,] next to your own sentences. It [self-annotating] would be better for those who are writing their own drafts” (Sihun, midterm interview). These comments suggest that self-annotation may not have been the most motivating as a class component of the genre pedagogy to those who paraphrased a model paper for having no data to write on their own. This lends support to Freedman’s (1993, 1994) argument that language skills necessary in the genre can be

spontaneously gained rather than intentionally learnt in a classroom only when the learner strives to work on the assignment in a realistic context.

On the other hand, positive comments of self-annotations commonly shared by genre-inexperienced and experienced students with beginner's proficiency were that the activity nudged them to pay more attention to sentence writing. For instance, Imju, grouped into the genre-inexperienced with beginner's proficiency, was able to "think about the sentence functions more" over the process of annotating her drafts, which eventually "pushed [me] to think more about the moves and steps" (final interview). Juwoon, a genre-experienced student with beginner's proficiency, viewed self-annotation writing as "a chance to think about how to structure my sentences" (final survey).

On the whole, genre-experienced students displayed a more positive attitude reviewing their own writing over the course of annotating their drafts, which served as "an opportunity to analyze each element" of their own drafts (Jongyun, final survey) or "an objective analysis of the unnatural structure, revealing which part was the problem" (Duho, final reflection notes).

Unexpectedly yet interestingly, one participant viewed annotating his own draft as a way of relieving the burden of writing in another language:

> Excerpt 5.10. Annotating my own draft, I think, makes me feel less burdened when writing. Even if my intention is not fully expressed in the writing, I can supplement it in the comment and clarify the meaning [in Korean]. First, I write down as much as I can and then leave annotations to make up for those weighing

on my mind like my shortcomings. In that sense, writing gets less burdensome (Sujong, midterm interview).

Not only self-annotations may allow some inconfident L2 writers, such as Sujong, to clarify their rhetorical intent for confirmation purposes, the process of annotating their own writing appear to engage students in activating metacognitive knowledge, monitoring their own performance (e.g., Duho, Jongyun) and reflecting on how they wrote and why they made those linguistic or content choices (e.g., Imju).

5.2.5. "Feels like an English class" vs."Anything but teacher feedback"

Although teacher feedback, a constitutive part of online feedback, was one of the most positively received class components, students shared different preferences on the type of feedback with individual preferences . Some students preferred for more feedback on non-linguistic aspects, such as the logical flow, while those with plans for imminent publication welcomed any kind of feedback as long as they could better their manuscripts.

Some of those who expressed their preference for feedback above the linguistic level might have held different expectations on the course or more value on logic than language. For example, Sihun, a first-term master student who paraphrased a model paper, felt like "taking an English class because of the grammatical feedback contrary to what I had expected from the course" (Sihun, midterm interview). Some students seem to place more value on logic as Juwoon, a second-term integrated PhD student drafting

his manuscript, revealed in his writing history: “I always focus on my logic. I think if my logic is clear, it is not important whether it is English or Korean which I have to use.” A third-year master student revising his own work with high genre-sensitivity also shared an interesting view that he does “not care about trivial grammatical errors,” because he can “leave it to the English editor anyway,” so he “normally uses Google Translate to draft an English paper” (Jinwoo).

One reason why some of the students may have felt too much focus placed on linguistic aspects could be because the teacher feedback mostly addressed language-level issues, suggesting alternative lexical choices and correcting grammatical mistakes considering the needs analysis results, not to mention the instructor’s limited content knowledge of the students’ research topics. Another compounded factor could be the automated grammar checker on Turnitin, where students’ submitted drafts were automatically proof-read. One of the most frequently made mistakes by the students were articles, which would explain why Sikyong, a second-term master student who paraphrased a model paper, found that “it seems only grammatical errors remain in my head although it was effective to get feedback on everything but technical terms” (Sikyong, midterm interview).

The student comments indicate that feedback on the discourse level and technical terms or expressions would further satisfy their needs. The fact that the language instructor may not be able to fulfill students’ needs by addressing their inquiries related to disciplinary knowledge or practice resonates with the concern about ESP programs raising “false expectations among the faculty and students” (Spack, 1988,

p. 37), leaving either party uncomfortable teaching or learning in an environment where students are more knowledgeable about the subject-matter than the instructor .

At times, students who had “no time to check feedback" busy revising their manuscripts for submission during the term (e.g., Yongup, Jinwoo), the overwhelming majority of students prioritized teacher feedback over other class components as shown in the final survey results (numerical details can be found in Section 5.1). In particular, Duho, the major critic of the pedagogy, displayed a favorable attitude towards teacher feedback, comparing other class components against it. He often used phrases such as “not as helpful as feedback,” or “the component helpful after feedback” during his final interview. Moreover, Duho left a steadfast comment at one point in the interview saying, “Honestly, I don’t want anything but feedback.” This remark indicates Duho’s strong partiality for teacher feedback to apparently compensate for his lack of grammar, expressed during his final interview. Overall, those who were drafting or revising their manuscripts relatively appreciated teacher feedback, regardless of the type, possibly due to the exigent needs for completing their own manuscripts for publication purposes.

By the end of the 15-week course, the students reported in their final reflection notes positive changes and areas of future improvement in their writing. Three of the most improved areas were perceived as their move structure or logical flow (26%), grammar (26%) and vocabulary (18%); the areas of future improvement were grammar (45%), composition skills (e.g., transitions, various sentence lengths) (20%), and vocabulary (19%). It is interesting to note that grammar and vocabulary were both voted as the most improved areas and the areas they wish to improve further in the future.

These results imply that lexicogrammar draws particular attention to the students over other aspects of writing.

CHAPTER 6. DISCUSSION

This chapter culminates the findings from Chapter 4 and 5 in view of integrating genre knowledge, bridging the gap between noticing and performing genre knowledge, and developing localized genre pedagogy. Section 6.1 discusses integrating genre knowledge drawing on the findings from learners' learning trajectories and experience with the genre pedagogy. Based on the discussion, Section 6.2 explores developing practical, localized genre pedagogy reflecting learners' needs, learning trajectories, and language learning contexts.

6.1. Interweaving Genre Knowledge

The findings of the study show that students' needs, artifacts, and evaluations of the genre pedagogy converge on the communicative use of move structure, lexicogrammar, and citations as the most essential domains. Understanding the rhetorical use of move structure and lexicogrammar particularly drew learners' attention, which were indicated in the triangulated results from students' model paper analysis reports, self-annotations on their drafts, and the written output. Additionally, understanding of the purpose and use of citation were also observed in students' interview data and a few self-annotated drafts. In a similar vein, students' final survey results support that the most well-received class elements were self-annotated writing and teacher feedback for providing them a hands-on opportunity to apply the learned

move structure, lexicogrammar, and writing conventions as well as identifying their areas of improvement from their written texts.

In the following sections, the three dominant themes from the findings of the study will be discussed in relation to relevant pedagogical practices. Section 6.1.1 expounds on the students' attention to formal and rhetorical dimensions of . Section 6.1.2 focuses on transition from knowledge telling to knowledge transforming. Finally, Section 6.1.3 discusses the gap between noticing and performing genre features.

6.1.1. Between Formal and Rhetorical Dimensions

The learners of the present study showed an inclination of paying more attention to the formal aspects intersecting with the rhetorical dimension (i.e., move structure, and lexicogrammar appropriate for the formal register with their rhetorical purposes), thus attending to them more in their writing in turn. The possible reasons are discussed in light of the focus of the given genre pedagogy, the nature of formal and rhetorical knowledge, students' needs and their implications.

Most importantly, the genre knowledge domains that majority of the students reported to be developed in the final survey mirrored those where students needed assistance most according to their needs analysis results, namely formal (i.e., lexicogrammar, move structure) and process (i.e., drafting and revising) dimensions of genre knowledge. This can be seen as a successful implementation of the genre pedagogy accommodating student needs. Most of all, the instruction and the genre analysis tasks students engaged in might have guided their performance to focus on move structure and relevant lexicogrammatical features. For example, the major genre

analysis task in the study was to analyze the moves of their model papers and any pertinent lexicogrammatical forms and functions before comparing them across other sub-fields in their group discussion. The purpose of the self-annotation task also included reviewing the move structure of their own writing in addition to clarifying their own rhetorical intent and reflecting on their word choices. Students may have found it easier to comment on more concrete and clear-cut formal aspects, such as their use of tense or frequently used skeletal expressions in RAs. This implies that rubrics or worksheets for genre tasks as well as instruction play an influential role in shaping learners' genre knowledge development path, which is what practitioners should take note of when it comes to designing genre analysis tasks in order to facilitate a balanced development of learners' genre knowledge.

It is also worth delving into the nature of rhetorical knowledge, which could be more challenging to be verbalized as opposed to the less fuzzier formal aspects of genre knowledge. A major reason for the students not perceiving rhetorical knowledge as promoted as formal knowledge, although their artifacts do not necessarily imply so, would be attributed to the nature of rhetorical knowledge. Essentially overlapped with the language-independent genre awareness and metacognition (Tardy et al, 2020; Gentil, 2011), rhetorical knowledge is less clear than other domains to be empirically attested to (Gentil, 2011). Given this fuzzy nature of rhetorical knowledge, learners may have found it challenging to clearly grasp the notion of rhetorical knowledge from the first place.

Previous studies imply that rhetorical knowledge is more complex than other components of genre knowledge, contributing to a reason why it was challenging to be

aware of problems with rhetorical knowledge for EFL learners (Huang, 2014) and that novice L2 writers may pay attention to sophisticated language use only after learning the general form (Tardy, 2005). Lending support to previous studies, the findings of the current study pose a fundamental question worth ruminating, whether rhetorical knowledge, constitutive of genre awareness, could be ideally acquired in an ESP classroom via explicit instruction and if so who should be ideal target learners.

In a similar vein, those with no genre experience would not find it easy to develop a sense of audience due to having no "visibility of proximate audience" (Winsor, 1996, p.52), in this case journal reviewers or potential readers. In particular, students with no immediate goals of submitting papers at international journals seemed to struggle most on developing this dimension of rhetorical knowledge. On the other hand, students who have attended a conference or received comments from journal reviewers (i.e., the genre-experienced group) might have a clearer sense of audience than those without such experience. In Winsor's (1996) study, an engineering student of hers was instilled in more tangible audience awareness when reading the target genre after meeting with the clients who would read his maintenance manual, which is an instructive genre characterized by audience awareness (Swale, 1990). Conversely, students with less exposure to their discourse community members could find it more difficult to relate to the notion of rhetorical knowledge, encompassing reader sensitivity, dynamics of persuasion, and author's positioning.

Finally, learners' insatiate needs for further developing formal aspects of their genre knowledge even after the course where they reported to have fostered formal aspects most merit attention to what formal knowledge means to them. Their practical

needs for language-level learning, despite their awareness of the significance of discourse-level genre awareness, are consonant with those of Korean engineering students from previous needs analysis studies (Cho, 2009; N. Kim, 2020; Shin, 2015). The students' voice also resonates with Huang's (2014) Taiwanese PhD student, A-Ming, who proposed offering an advanced language course for teaching sentence-level writing by the end of the genre pedagogy class. Huang (2014) interpreted A-Ming's suggestion as an indication of "gaining an awareness of how language use contributes to readers' impressions" and the integration of "formal knowledge (to create English sentences), process knowledge (to create his own sentences) and rhetorical knowledge (to create persuasive sentences)" (p. 184). As much as that sounds promising, learners' needs for more formal knowledge support could be seen from a different light.

In another genre learning study of L2 learners, having more solid formal knowledge was able to place L2 learners in a better position to engage in their disciplinary discourse as they have more repertoires required in the genre that concretize their understanding of disciplinary discourse (Jwa, 2015). Indeed, more proficient writers in the current study were generally able to leave more analytical comments, explaining their rhetorical intent or contextual features, while their counterparts were mostly limited to leaving descriptive comments on textual features with a few exceptions. This may indicate that the formal domain needs to be sufficiently developed for learners so as to activate the rhetorical dimension of their genre knowledge. In other words, increasing formal knowledge could facilitate the development of rhetorical knowledge.

Corresponding in nature, genre knowledge has been compared with the knowledge framework from educational psychology (Schraw & Dennison 1994). The formal domain of genre knowledge is comparable to declarative knowledge (what one knows), the process domain to procedural knowledge (how to use what one knows), and the rhetorical domain may be somewhat similar to the nature of conditional knowledge (when and why to use what one knows) (Kessler, 2020, 2021; Negretti & Kuteeva, 2011). Applying the findings that declarative knowledge precedes procedural knowledge (Berkenkotter et al.,1988) to genre knowledge domains, it is only natural that genre learners need to know what to use before knowing how to use the knowledge, not to mention when or why to use it. In that sense, without fulfilling basic formal knowledge, it would be unreasonable to expect learners to show apt process or rhetorical knowledge. What is important to note here is that formal knowledge should not be overlooked in recent ESP pedagogy discourse, where raising rhetorical awareness is weighted while neglecting textual features could be an oversight.

All in all, solidifying formal genre knowledge across multiple dimensions should serve as a stepping stone for developing overall genre knowledge, encompassing genre awareness and metacognition. To develop genre knowledge comprehensively, it would be critical to provide learners with balanced opportunities to cultivate the dimensions of genre knowledge in accordance with their needs and learning trajectories.

6.1.2. From Knowledge Telling to Knowledge Transforming

Another noteworthy finding of the present study is the transitioning from knowledge telling to knowledge transforming experienced by a few genre-experienced

students (e.g. Takjin, Jibum, Yongup), who used to merely read or write for content knowledge. The shift towards paying attention to the intention of the writer (writerly reader) or to the genre receivers' reading experience (readerly writer) shown in the data can be seen as a precursor of transitioning from knowledge telling to knowledge transforming, which are two knowledge models of composing processes postulated by Bereiter and Scardamalia (1987).

According to Bereiter and Scardamalia (1987), knowledge telling is often found in novices' process of being confined to comprehending or addressing the topic of the text; knowledge transforming is more strategic knowledge construction adopted by more advanced writers, engaging in an interactive problem solving of content and rhetorical knowledge such as connecting the content to the purpose or goals of writing. Examples of knowledge transformation from genre-experienced students like Takjin was delineated in Chapter 5.2.

Reading and writing being interconnected, analyzing the move structure seemed to invoke not only a changed reading strategy but also a reader-friendly mindset as a writer. The given genre analysis task in the class was ultimately aimed to serve as a springboard for students to produce written outcomes appropriate for their social context after learning about formal conventions from their model papers; it also gave a positive influence of inculcating a mindset of an advanced reader reading through writer's intentions.

To facilitate learners' knowledge transforming from knowledge telling, genre practitioners may add more reflective, self-regulating, monitoring assignments, which could eventually promote global, discourse-level change in the long haul.

6.1.3. Between Noticing and Performing

In this study, not every student performed in writing the genre features they had noticed while approximately one third of the genre-experienced students showed encouraging changes in their move structure or arrangement based on self-reflective or interactive annotations with the instructor on their drafts. Although all students were generally able to verbalize their genre knowledge in model paper analysis reports, annotations, and interviews, it was only a few exceptional students who were able to output their declarative, formal knowledge in written products as shown in Chapter 4.2.

Students whose self-annotations manifested how they were involved in a problem-solving process interacting between content and rhetorical spaces were analyzed as mature writers in this study. This dual problem-solving process led to adding or rearranging rhetorical moves in the final drafts, which is seen as knowledge transformation often observed in expert writers' writing process (Bereiter & Scardamalia, 1987). The learners in the study analyzed as more mature writers included in their self-annotations more self-monitoring comments (e.g., plans of adding more explanation, clarifying definitions, or finding better words to express their intent) either in the form of self-memos or interactive dialogic memos asking for or responding to teacher feedback.

Reflecting on one's own writing or having inner or outer dialogues addressing content and rhetorical problems is often found in expert writers' writing process (Bereiter & Scardamalia, 1987). Empirical findings also indicate that such self-regulation metacognitive activities are linked to better writing performance by more advanced writers (Kessler, 2020; Negretti & Kuteeva, 2011; Yayli, 2011, 2012). In the

present study, the self-annotation task was designed to nudge students to reflect or monitor their own writing processes, and apparently served its purpose on especially genre-experienced students who engaged in drafting their own manuscript (e.g., Heetae, Takjn, and Jibum) according to their artifacts and positive student evaluation of the component. Consequently, these students succeeded in addressing rhetorical problems by adding new moves or arranging them more effectively, not limited to local changes to which novice writers usually are confined.

While there were students who were able to revise their writing at the global level, the majority of the students merely made local-level changes on their revised drafts despite that they were able to verbalize discoursal genre knowledge in other tasks, such as model paper analysis reports and their self-annotations. In other words, these students display the gap between noticing and performing genre features.

The disparity between what one knows and performs could be discussed in the light of the relationship between language-independent genre awareness and language-dependent genre knowledge once again. Even if some students may have gained genre awareness either from the given instruction or their previous experience with the target genre, their L2 proficiency could have gotten in the way of transferring the genre competence. This argument aligns with Cumming's (1989) claim that transfer of writing expertise in L1 is conditioned by L2 proficiency. If genre awareness is not bounded by languages as claimed by certain genre scholars (Gentil 2011; Sommer-Farias, 2020; Tardy et al., 2020) and genre awareness and genre knowledge are inseparable (Cheng, 2018), it may be fair to say that genre awareness may not be able to

surface without adequate language skills, a formal subset of genre knowledge in the language-dependent sector.

In consequence, bridging the gap between noticing and performing genre features may also connect to developing genre awareness and genre knowledge together. Although promoting metacognitive genre awareness has been at the center of attention in the ESP scholarship (Cheng, 2007; Kessler, 2021; Negretti & Kuteeva 2011; Tardy et al., 2020), it may not be sufficient to improve one's genre performance without proper language-specific genre knowledge, which is arguably based on L2 writing proficiency. Without furthering their L2 writing proficiency, L2 novice genre users may not be able to either accurately express the formal knowledge or genre awareness, whether it has been fostered inside or outside of the classroom.

Consequently, what is ultimately needed to L2 genre learners, either having pre-existing genre awareness or not, might be more writing practice in L2 based on proper understanding of the form and use of lexicogrammar appropriate for the genre. For example, the students could engage in more sentence-level paraphrasing tasks where they need to use different types of citation for different rhetorical purposes. Equipped with solid genre knowledge and adequate writing proficiency, L2 genre users will be able to recontextualize, in the long run, their genre knowledge by accurately expressing it in their output.

It is not an easy job to satisfy all L2 genre learners with different levels of genre knowledge and experience in the same class. Thus, it would be necessary and beneficial to find the common ground that learners with diverse backgrounds share in their learning context. In an EFL context, where both L2 input and output are undeniably

insufficient compared to ESL contexts as in the current study, the common goal of students with diverse research backgrounds would be advancing their L2 writing proficiency. Language support is needed by not only more experienced genre users who are writing their own manuscripts with a certain extent of prior genre awareness but also novice genre learners whose genre awareness and language skills are budding together. Once they are equipped with adequate L2 writing proficiency, these learners would be able to not only transfer any existing genre awareness but also begin to build it in balance with genre knowledge.

6.2. Towards a Practical Genre Pedagogy

The current study took place in a Korean EFL context where learners ranged from 1st-term master students to 5fth-term integrated PhD students with varying levels of genre experience or sensitivity based on their exposure to the discourse community, prior publication experience, and plans for imminent publication. Those with more genre experience or higher genre sensitivity, who are more experienced with their disciplinary discourse or drafted their own manuscript for publication during the term, appear to have benefited the most from the genre pedagogy as echoed by majority of students in their third year of master's program or above, which is when they engage in more academic activities, according to the cohort.

Not only were they able to better verbalize the contextual factors of diverse move structures across fields in their model paper analysis, the genre-experienced group also actively communicated with the instructor via self-annotations and feedback over

the course of drafting or revising their own work. While some of the interactive students successfully manifested the noticed genre knowledge in written output, others were not able to fully express their rhetorical intent when concrete teacher feedback was not available, supposedly owing to a lack of L2 language skills among others. The findings suggest that L2 genre learners may benefit from interactive exchange of opinions and feedback with instructors, especially from teachers' concrete suggestions for alternatives to their writing, serving as a stepping stone for the next level of proficiency.

By the end of the study, learners perceived that their move structure and lexicogrammar have improved most, and interestingly, lexicogrammar was ranked as the most necessary future improvement to be made for themselves. The most well-received class components of the given genre pedagogy were self-annotated writing and online feedback for assisting students' formal and process dimensions of genre knowledge. Other class components designed to raise rhetorical awareness, such as model paper analysis tasks and group discussions, were not rated as high along with rhetorical knowledge development. Reasons include higher needs in formal genre knowledge (e.g., lexicogrammar) than genre awareness, unfamiliarity with the unconventional genre tasks, and limited subject-matter knowledge for genre-inexperienced students, all possibly compounded by the indistinct nature of rhetorical knowledge.

The learners of the present study analyzed model papers of their selection by the move structure learned during the instruction and compared their analysis in groups, where specializations or fields of studies varied. Students were able to learn about the flexibility firsthand by experiencing multiple challenges of comparing the move structures learned from the lecture and actually found in their model papers and noting

commonalities and variations between move structures in their field and other groupmates.

By realizing the variability of move structures across sub-fields in the same department, in turn, the students were able to better notice the typical move structure in their own specializations, thus realizing the significance of following the writing conventions in their discourse communities. As challenging it might have been to compare varying move structures with groupmates often associated with different specializations, the educational goal was to better understand learners' own field-specific move structure, as "specificities cannot be defined unless they are compared with other subdisciplines" (Masawana et al., 2015, p.2).

A major implication of the current findings is that EFL learners in a similar context with the present study may have stronger needs for improving formal knowledge, particularly lexicogrammar, more than genre awareness as in the learners in this study. Given the circumstances where learners are under pressure for writing in L2 and often submitting their manuscript with an impending deadline, the EFL learners may need more assistance on genre knowledge, lexicogrammar resources above all.

To date, ESP genre scholars have argued that metacognitive genre awareness can, and should, be developed in the classroom. In particular, existing genre awareness raising tasks have learners compare the characteristics of various genres in an attempt to facilitate the process of recontextualization (Cheng, 2007, among others). In this study, however, some students found it challenging to compare papers across fields or research methods even in a single genre, research articles, especially in a group of inexperienced first-year students. Also, there were students unmotivated to do the genre analysis task,

believing that genre awareness is not subject to explicit learning in class but natural, unconscious raising along their academic experience.

Arguably, the more abstract nature of genre knowledge like understanding the moves and their communicative functions may seem like something they should implicitly acquire along their journey of using genres. It is conceivable that some of these learners who apparently discounted genre analysis tasks, such as Wusung, took language-independent genre awareness as "a muscle you have to work" instead of learning explicitly separately in the same manner grammar and vocabulary, conversely, were described so by a trilingual genre learner, Amanda, in Sommer-Farias (2020) (p. 93). These contrasting standpoints on different aspects of genre knowledge mirror different needs in learners, depending on their starting points for language learning and learning context, aside from individual variations.

The present findings that learners with more experience in the discourse community revealed further promotion of genre knowledge suggest that genre knowledge may fully blossom when coupled with genre awareness gained by engaging with hands-on academic activities in their discourse community. This implication is consonant with the main arguments of the New Rhetoric school that genre awareness is something that can not be taught or learned in class, outside of the authentic context where the genre is in actual use (Miller, 1984). Likewise, explicit instruction of genre has been argued to be effective under the strict conditions where students' learning styles suit, and more essentially, where students practice authentic tasks required in their target genre (Freedman, 1993; Mitchell & Andrews, 1994). This means explicit instruction alone cannot serve as a sufficient condition for successful genre performance

when students do not engage in authentic genre tasks, which may explain the gap between noticing and performing genre shown by certain genre-inexperienced students who opted for the paraphrasing task as an alternative for drafting one's own manuscript in the present study. Therefore, it would be paramount to engage learners with authentic tasks, which allow genre learners to bridge genre knowledge and performance, to benefit genre learners in an ESP class where explicit genre instruction is provided.

Another noteworthy finding of the study is that what is valued in the engineering world may diverge from those in social sciences. If data and evidence are at the core of engineering, as claimed by Grimson & Murphy (2015), rhetorical knowledge that makes up logic in engineering is likely to be data-specific, rather than language-specific. For instance, students' analyses of model papers and excerpts from student interviews also showed the minimum use of modal verbs for hedging or boosting.

Taking into account such culture, the genre analysis task itself may have been a new genre to this group of learners, some of whom might be also new to the target genre, RAs. Despite that they were allowed to analyze the model text in their L1, some students apparently found it challenging to describe their analysis by means of words as opposed to numerical or graphical representations. One anonymous comment left at the university course evaluation encapsulates the challenge of genre analysis as in "we are not English language majors or experts, so it was very hard to analyze rhetorical intentions embedded in the model texts."

It is important to note that the engineering students in this study were arguably not in a better place to analyze texts and communicate their textual and contextual analyses in neither written or oral forms compared to the learners from previous studies,

including graduate students and lecturers in Applied Linguistics (Negretti & Kuteeva, 2011), law school students (Kessler, 2020, 2021), and advanced multilingual foreign language learners (Sonner-Farias, 2020). Analyzing their written products and interview data made me, as a social science major, realize that these students are most likely not accustomed to elaborating on findings as well as expressing their opinions in depth even in their L1. It was at times frustrating for me to deal with responses in rather short answers, numbered phrases, or keywords only when the students precisely kept their responses efficient without allowing much elaboration or background explanation. Given the circumstances, the findings of this study are meaningful and valuable in that they illuminate Korean engineering graduate students' pains and gains from their first genre pedagogy in an EFL context, calling for more inquiries in search of apt, practical pedagogy.

This study shed more light on the necessity of writing practices by engineering graduate students in a Korean EFL setting. Despite some encouraging cases, it would benefit overall engineering students if they could be given more chances to practice written and oral communication skills as early as high school or university years before coming to graduate school, where the main focus should be placed eventually on research integrity rather than language learning. If so, they would be able to focus on the more comprehensive development of genre knowledge as more prepared genre learners, possibly entertaining challenging genre awareness tasks or even genre critique or parody, as suggested as alternatives for genre analysis by recent genre scholars (Hyon, 2017; Tardy, 2016), in the long run.

While it may sound ideal to facilitate all aspects of genre knowledge by engaging learners in various genre-related tasks in the classroom, the findings of the current study imply that care should be taken in adopting genre tasks. Prior to engaging novice genre learners with genre analysis tasks, it is paramount to analyze learners' needs based on in-depth understanding of their culture and learning context. In the present study, for example, novice L2 learners had difficulty selecting model papers due to the technicality of engineering papers, which have not been reported or cautioned as an obstacle in other previous studies. Some of these Korean engineering graduate students were also unfamiliar with in-class group discussions, consonant with the Chinese learners who were reluctant to participate in group discussion in Flowerdew's (1998) study even after decades when collaborating in a group is required to survive academia.

Considering any unexpected cultural factors, it would be thus indispensable to allow for flexibility and amendment to the genre pedagogy as observing and tracing learners' genre knowledge development over the course of genre pedagogy. To bring out the maximal learner experience with genre pedagogy, practitioners may have to prioritize and coordinate genre tasks– from teaching formal genre features, to raising genre awareness, and to tap into metacognition– all based on a clear understanding of the learners' needs, experience with the genre, proficiency in L2, and their learning environment.

CHAPTER 7. CONCLUSION

This chapter concludes the dissertation by proponding implications for future genre pedagogy and research. Section 7.1 discusses setting practical boundaries for pedagogical implications in EFL contexts, in particular, and Section 7.2 shares the limitations of the study. Lastly, Section 7.3 suggests directions for future studies in genre learning and teaching.

7.1. Implications for Future Genre Pedagogy

There is no one clear-cut pedagogy for every learner. Genre practitioners often need to cater disparate groups of learners with divergent needs at a different point of time in their program as in the present study. Based on the findings of this study, a few pedagogical suggestions can be shared, especially for genre learners in an EFL context, whose first priority is on genre knowledge development with immediate writing needs.

Given that metacognition plays an important role in expanding genre awareness, which interplays with genre knowledge (Gentil, 2011; Tardy et al., 2020), students should be offered with ample opportunities to plan, revise, monitor, and evaluate their writing as part of the class activities or assignments, so that they can activate metacognition and develop the full range of their genre knowledge.

In this study, students' annotations on their own drafts were a helpful means to show where the students stand in terms of genre knowledge and composition skills for

both instructor and students. Those who have a certain degree of genre knowledge but not sufficient writing skills can annotate their intentions or difficulty to express such intentions in their drafts. Doing so in the writing process not only helps the instructor to assess students' standing in terms of metacognitive genre awareness but also enables learners to better identify areas of improvement for themselves.

To address learners' writing needs in an EFL context, genre pedagogy should bring more focus on regular hands-on writing practice, assisted with detailed feedback suggesting concrete, ready-to-use alternatives whenever possible. Given the genre users' imminent goal of publishing RAs, what they practically need might be language resources as a means of delivering their research findings. Learners in a similar environment would also benefit from utilizing online writing tools in lieu of detailed teacher feedback, if not available at all times. Computer-assisted writing aids, including but not limited to online dictionaries, Google Translate engines (Min, 2017), and specialized corpora (Chang, 2014; J. J. Kim, 2020) could offer practical alternatives.

As second language practitioners may see more value in and greater emphasis on focusing on generic form than L1 writing teachers (Tardy, 2011), genre practitioners in EFL contexts would need to set practical boundaries between addressing genre knowledge and genre awareness when it comes to allocating class hours. If the class goal is to focus on developing language-specific genre knowledge in an EFL context, it may be necessary to acknowledge the New Rhetoric school's view on the unteachable nature of genre awareness. Expanding the perspective from ESP to other theoretical and pedagogical approaches, as Tary (2011) suggests, may widen the horizon of

understanding genre in not only first language writing but also in second language or multilingual writing.

If novice genre users can, or should as the Miller's (1984) argument, raise genre awareness outside the classroom, genre practitioners may be able to spare more class time on fostering genre knowledge and addressing students' immediate writing needs. That way, either novice practitioners or genre learners would not have to feel overwhelmed by the pressure of juggling genre awareness raising tasks and instructing within limited class hours.

As a more practical alternative, genre practitioners may be able to offer learners opportunities to engage in their discourse community outside of the classroom in the form of class assignments. Instructors may assign learners ethnographic genre tasks, such as interviewing a discourse community member (Devitt, 2004; Johns, 1997, 2008) or reporting learners' experience from attending conferences, if possible in reality. Other options include inviting field experts to share the discourse community norms for special lectures or inviting previous students or senior students with more experience with publishing RAs or presenting at conferences in their fields. Such options are available for language expert practitioners unless team-teaching with a content expert is a viable option.

There are many factors that affect L2 writers, compared to their L1 counterparts: learners' sociocultural contexts, identities, L2 proficiency, and prior learning experiences and expectations, and language proficiencies impact L2 writers differently than monolingual writers (Tardy, 2011). As much as it is demanding and challenging to an ESP practitioner, it is paramount to conduct needs analysis catering not only to

disciplinary variation but also individual needs and characteristics as discussed in Kuteeva (2013), especially when introducing a new task such as genre analysis to an EFL group requiring higher language support.

Illuminating EFL learners' needs in a particular dimension of genre knowledge based on their experience with genre pedagogy, this study calls for localized genre pedagogy corresponding to the learners' immediate writing needs. Moreover, novice teachers in genre pedagogy would need training in familiarizing themselves with conducting needs analysis, designing genre analysis tasks, if any, to coordinate a practical, approachable genre pedagogy for the learners.

7.2. Limitations

This study attempted to delineate learners' genre knowledge development and performance by analyzing student artifacts as the outcome of the given genre pedagogy; however, there could be potentially latent genre knowledge that was not reflected in the data. It is possible that learners may have not been able to fully verbalize or perform certain aspects of their genre knowledge due to the early stage of their procedural or conditional knowledge. Interpretations of the findings, therefore, should be limited to students' declarative knowledge or verbalizable genre knowledge, thus excluding any budding genre knowledge underneath the surface level.

Next, it would have shown a clearer picture of learners' genre knowledge development if their previous genre knowledge were properly assessed before the study. Despite the fluid, multilayered nature of genre knowledge, any form of a diagnostic test

that can gauge learners' previous genre knowledge could be compared with the final assessment on the same criteria to see any change from a quantitative perspective. Although the effect of instruction was not the focus of the current study, future research could be done on developing an appropriate diagnostic assessment tool of genre knowledge of RAs, so it can be administered before and after a genre-based instruction to gauge any change of learners' genre knowledge after the genre pedagogy.

The current study focused on one genre, RAs, in the instruction and students' genre analysis, leaving room for additional genres to introduce to learners for their genre analysis tasks so their genre awareness could be furthered across multiple genres in the future. It could be more beneficial to add sub-genres relevant to RAs, such as conference papers, communications, and proposals, as part of the target genres for learners to discuss the interplay between their genre knowledge and genre awareness. This decision, however, should be made carefully depending on learners' needs, their language proficiency, and the teaching and learning environment.

Given the limitations, the value of the present study would be portraying the struggle and success novice genre learners experienced over the course of building their genre knowledge in the genre pedagogy attempting to reflect learners' needs and their language learning environment.

7.3. Future Studies in Genre Teaching and Learning

In line with the issues discussed above, prospective future studies in genre teaching and learning are boundless. To name a few, potential avenues for future

research extend to diverse areas, such as classroom instruction, pedagogic materials, assessment, contrastive analysis, teacher training, developmental sequence of genre learning, and multilingualism.

First of all, more classroom research in understudied fields or learning contexts would provide deeper insights into diverse learners' development of genre knowledge and appropriate pedagogy. Genre practitioners may conduct action research in an effort to devise or revise their own genre pedagogy so learners can benefit from a more effective learning or practicing of the target genre. It would also be interesting to see how EFL learners respond to alternative genre awareness raising assignments (Devitt, 2004; Johns, 1997, 2008), such as interviewing discourse community members and reporting back to class.

In order to accurately compare genre-based instructional effects, developing valid assessment measures is called for so that learners' prior and post genre knowledge can be properly gauged. To this end, it would be necessary to continue refining the construct of genre knowledge to design proper rubrics for assessing learners' comprehensive development of genre knowledge, not limited to genre knowledge. To go one step further from assessing instructional effects, devising an assessment that can foster genre users' learning and feed back into genre pedagogy would merit prolific future studies. Including in evaluation activities that involve learners' self-regulation or self-monitoring over the course of writing (e.g., note-taking, planning, reflecting on writing strategies) would foster their metacognition, which may not only promote genre knowledge development but also comprehensive writing ability.

Considering multiple roles imposed on genre practitioners in EFL contexts as in the present study, more hands-on pedagogical materials would ease the burden, thus warranting more future research. Since Swales and Feak's (1994, 2004, 2012) practical guide for genre teaching and learning, more recent genre pedagogy textbooks (Cheng, 2018; Hyon, 2018) have been available; however, the main target audiences are mostly graduate students in Applied Linguistics (AL) or social sciences. More approachable, schematized genre analysis activities along with more relatable grammar and vocabulary worksheets are in need for learners in hard sciences as they would better engage in the activities when the content and multimodality of the material are more typical of their disciplinary discourses. To develop research-based textbooks or workbooks catering to hard science students, it would be indispensable to collaborate with specialist informants. Corpus-based research with subject-matter experts on the most field-representative text or lexicogrammar could serve as a groundwork for creating more relatable pedagogical materials for underrepresented genre learners.

In light of the challenge some students experienced with analyzing model papers as part of their genre analysis, comparing model text with more approachable counterparts, such as student writing or L1 text in the same genre, would lower the threshold for learners and extend the research of contrastive analysis. It would provide insights into a more ideal use of genre when disparities between the texts written by novice and expert writers are analyzed. Noticing any common or divergent structure or discourse of RAs in learners' L1 and L2 may not only contribute to contrastive analysis but also possible transfer of learners' existing genre awareness in L1, if any.

Lastly, one of the most valuable and essential research needed for ESP instructors would be on the training of novice ESP teachers to better prepare them with suitable genre pedagogy for both learners and teachers. Meaningful insights could be elicited by comparing between novice and experienced teachers' lectures, class tasks, or interactions with learners. Interviewing multiple genre practitioners to compile effective genre teaching strategies may also inspire novice teachers' genre pedagogy. Most importantly, seeking a feasible way to collaborate with either fellow ESP instructors or specialist informants would add depth to the current ESP genre pedagogy. After all, as Swales and Lindemann (2002) noted, "No instructor, however polymathic and experienced, can ever really hope to unlock that huge door [to the entire academic universe of discourse]; what she or he can do is help the participants unlock that door for themselves" (p. 118). Ultimately, having learners' own learning at heart opens the door to more growth in research, practice, and learning of genres.

APPENDICES

APPENDIX 1

Course Syllabus

<table>
<tr><td>Class no.</td><td>M****.*****</td><td>Section no.</td><td>00*/00*</td><td>Course title</td><td colspan="2">Research Ethics in Engineering and Academic Writing</td><td>Credit</td><td>2</td></tr>
<tr><td rowspan="2"></td><td>Name & E-mail</td><td colspan="3">Jaymin Kim (janet*****@gmail.com)</td><td>Phone</td><td colspan="3">010-****-****</td></tr>
<tr><td colspan="2">Consultation time/place:</td><td colspan="6">By prior appointment</td></tr>
<tr><td>Course objectives</td><td colspan="8">This course provides an overview of scientific research article (RA) writing to graduate students in the program of ******* Engineering. To cultivate their understanding of the RA genre and develop their English writing skills, students will engage in several activities, including model paper analysis, group discussion, and manuscript writing and/or revising.

By the end of the course, students will be able to
1. understand the procedures and principles of writing a scientific research paper (RA).
2. identify the overall structure, useful academic expressions, and the author's intended communicative purposes embedded in certain language choices in each section of the RA in their field.
3. write one research article manuscript following the four-section outline: Introduction, Methods, Results, and Discussion (Note: The outline may vary by journals).
- Students with their own data will submit the drafts of their own work.
- Those without data will practice writing using others' published data of their choice.

By week 2 (Fri., 3/15), students must select at least two recent research articles (RAs) from one of the high-impact journals in their fields (e.g., AIAA, IEEE). The selected articles will be analyzed as model texts, providing macro structure and useful expressions that students can adapt to their own manuscript writing. Students will discuss their analysis of model papers with the author or a mentor who has published RAs before sharing what they learned with their group members in class. The criteria for selecting RAs should meet at least two of the following:
1. Papers published in a journal where you wish to submit your work in the future
2. Those with the classical structure of Introduction, Methods, Results, and Discussion (IMRD)
3. Those written by eloquent scholars or native-speakers of English
4. Those recently published by a mentor (e.g., your advisor or seniors) with whom you can discuss the writing of the RAs.</td></tr>
<tr><td>Textbook</td><td colspan="8">Primary text: H. Glassman-Deal, Science Research Writing for Non-native Speakers of English. Imperial College Press, 2010. (e-book available at the library)
Supplementary text: J.M. Swales and C.B. Feak, Academic Writing for Graduate Students: Essential Tasks and Skills, 2nd ed. Ann Arbor, MI: University of Michigan Press, 2012. (handouts)</td></tr>
<tr><td>Assessment</td><td>Attendance</td><td>Assignments</td><td>Mid-term</td><td>Final project</td><td>Quiz</td><td>Attitude</td><td>Etc.</td><td>Total</td></tr>
</table>

	10	70	0	20	0	0	0	100
	Attendance (10%): Absences due to medical reasons or academic activities (e.g., conferences or presentations) will be excused as long as proof of documents is emailed to the instructor, preferably in advance. Assignments (70%): model paper analysis (15%) + reflection notes on group discussion (5%) + annotated draft (Introduction, Methods, Results & Discussion, Conclusion, Abstract) (50%) Final project (20%): final revision of your annotated manuscript							
Course schedule	Week 1: Needs analysis, diagnosis writing, research ethics and plagiarism 1 W2: Research ethics and plagiarism 2, Using corpus tools to identify potential useful phrases W3: Overall structure of research articles, Writing about Methods/Materials W4: Group discussion on model paper analysis (Due: analysis of Methods, reflection on group discussion) W5: Writing about Results (Due: annotated Methods draft) W6: Group discussion on model paper analysis (Due: analysis of Results, reflection on group discussion) W7: Self-study week for the mid-term, individual consultations 1 (optional) (Due: annotated Results draft, * revised Methods) W8: Writing the Discussion/Conclusion (Due: * revised Results) W9: Group discussion on model paper analysis (Due: analysis of Discussion/Conclusion, reflection on group discussion) W10: Writing an Introduction (Due: annotated Discussion/Conclusion) W11: Group discussion on model paper analysis (Due: analysis of Introduction, reflection on group discussion) W12: Writing the Abstract (Due: annotated Introduction draft) W13: Group discussion on model paper analysis (Due: analysis of Abstract, reflection on group discussion, * revised Discussion/Conclusion) W14: Summary, course evaluation (Due: annotated Abstract draft, * revised Introduction) W15: Self-study week for the finals, individual consultations 2 (optional) (Due: * revised Abstract) Final project due by 6/20 (Thurs.) (*: optional assignments)							

In this course, research study participants will be recruited. The aim of the study and the criteria for recruiting participants are as follows:

1. Aim: To trace the development of Korean engineering students' genre knowledge and writing of research articles (RAs) in a writing course taught with an English for Specific Purposes (ESP) pedagogy

2. Criteria for recruiting participants: Korean Students whose English is their second language

3. Activities: Submit all of the course assignments indicated in the above syllabus and participate in two individual consultations to discuss with the instructor any lessons learned or questions raised from completing the given assignments.

4. Reward for participation: Instructor's feedback on revisions submitted by the designated due dates

   More details about the research study will be provided in class after the term begins. No disadvantages will be posed to those who do not wish to participate in the study.

APPENDIX 2

Scoring Rubric (Adapted from Kim and Kim (2017))

	Content	Organization	Language Use
Criteria	1. Does the paper include the essential moves and steps that are often used in the relevant field? 2. Does the thesis develop based on supporting evidence?	1. Have the ideas developed coherently, logically, and smoothly (e.g., following the old-to-new information flow or 2-3-1 rule)? 2. Has the paper used appropriate cohesive devices (e.g., logical connectors, repetition, and transitional words)?	1. Has the author used some of the linguistic features that are often used in the pertinent section of a research article (e.g., skeletal expressions)? 2. Has the author used accurate, diverse, complex vocabulary, grammar, and sentence structure?
5: Excellent	Essential moves and steps are clearly present.	Completely coherent, accurate use of cohesive devices	Accurate, a broad range of forms; a good balance of simple and complex sentences; and source text language well integrated with student-generated language

4: Great	Most of the essential moves and steps are clearly present.	Generally coherent (and/or) mostly accurate use of cohesive devices	Mostly accurate with some minor errors (and/or) a relatively broad range of forms (and/or) a relatively good balance of simple and complex sentences (and/or) source text language adequately integrated with student-generated language
3: Satisfactory	Essential moves and steps are at times not clearly present.	At times incoherent (and/or) at times inaccurate use of cohesive devices	At times inaccurate (and/or) somewhat narrow range of forms (and/or) somewhat limited to simple sentences (and/or) some reliance on source text language, not always integrated with student-generated language
2: Developing	Essential moves and steps are often not present.	Often incoherent (and/or) often inaccurate use of cohesive devices	Often inaccurate with some major errors (and/or) often narrow range of forms (and/or) often limited to simple sentences, (and/or) heavy reliance on source text language, not integrated with student-generated text
1: Needs improvement	Essential moves and steps are mostly not present.	Mostly incoherent (and/or) mostly inaccurate use of cohesive devices	Numerous major errors (and/or) a very narrow range of forms (and/or) mostly limited to simple sentences, (and/or) very heavy reliance on source text language, not integrated with student-generated text.
0: No evidence	No evidence of content	No evidence for organization	No evidence for language use

APPENDIX 3

Needs Analysis (IRB No. 1902/003-001)

IRB No. 1902/003-001 **유효기간: 2020 년 2 월 14 일**

요구분석 설문지

본 설문은 연구자의 논문작성법 강좌를 수강하는 석,박사 대학생원들을 대상으로 실시합니다. 본 설문의 목적은 학생들의 영어 학술 논문에 대한 경험 및 인식을 조사하고 수업에 대한 기대 및 요구를 분석하여 보다 만족스러운 강좌를 구성하기 위함입니다. 성실히 답해주시면 내주신 의견을 바탕으로 앞으로 수업의 방향을 정하고 수업을 진행하는데에 큰 도움이 될 것입니다. 설문에 적은 내용은 평가 및 학점에 영향을 미치지 않습니다.

아래 사항은 연구참여자 개인 정보에 관한 질문입니다. 개인 정보는 영어 학술 논문에 대한 지식과 영작문 실력의 변화 여부를 분석할 때, 연구참여자들의 배경과 학술 논문에 대한 경험을 파악하기 위한 기초 자료로 쓰일 예정입니다. 개인식별정보는 위 연구의 자료 수집 목적 이외에 사용되지 않을 것이고 연구가 종료 되는대로 파쇄될 것입니다.

아래 해당되는 사항을 기입하거나 표기해주세요.

1. 학번:
2. 성별:
3. 나이: 만 세
4. 학위 과정: 석사, 박사, 석·박사통합
5. 학기 차수:
6. 세부학과/연구실:
7. 영어권 국가 체류 기간 (해당 시)
   1) 국가 명:
   2) 기간: 년 개월
8. 가장 최근에 응시한 공인 영어 시험 명:
   1) 응시일: 년 월
   2) 시험 점수:
   3) 작문 영역 점수(해당 시):
9. 학술지 게재 경험 (해당 시만):
   1) 국문 학술지 횟수: 회,
   2) 국문 학술지 제 1 저자로 게재한 횟수(해당 시): 회
   3) 영문 학술지 횟수: 회,
   4) 영문 학술지 제 1 저자로 게재한 횟수(해당 시): 회
10. 본 수업에서 논문의 형식으로 작성할 수 있는 본인의 데이터 분석 결과가 있습니까? (해당 시)
    1) 예 ( ), 2)투고 예정일(해당 시): 년 월 일

Version 1.1(2019.2.15.)

다음은 설문 문항입니다. 해당되는 곳에 표시를 하거나 내용을 적어주십시오 (총 20 문항).

1. 귀하의 분야에서 학술지 게재를 위한 논문을 쓸 때 주로 어떤 언어를 사용합니까?

   1) 영어

   2) 한국어

1-1) 영어 대 한국어 사용 비율 = (:)

2. 귀하의 학위과정에는 졸업 전까지 영어 논문을 학술지/저널에 수록해야 하는 졸업요건이 있습니까?

   1) 없다

   2) 있다

2-1) 있다면 논문 몇 편을 수록해야 합니까? (편)

3. 영어 작문 능력이 본인의 졸업과 앞으로의 연구에 어느 정도 중요한 역할을 한다고 생각하십니까?

   1----------2----------3----------4

   (1) 전혀 중요하지 않다, (2) 조금 중요하다, (3) 꽤 중요하다, (4) 매우 중요하다

3-1) 위의 답변을 고른 이유에 대해 간단히 적어주십시오.

아래 4 번부터 7 번 문항에 대해 중요하다고 느끼는 정도를 1(전혀 중요하지 않다)부터 4(매우 중요하다)로 표시하십시오. 답변에 대한 이유도 간단히 적어주시기 바랍니다.

영어 학술 논문을 작성하는데에 **다음 각 항목이** 어느 정도 **중요하다고 느끼십니까**?

4.	**학술 논문의 형식과 구성에 대한 지식** **예**: 논문의 관례화된 형식 및 규범(writing convention), 논문의 필수적인 구성 및 내용, 논문에 상용되는 어휘와 문법적 특징	1------2------3------4 (1) 전혀 중요하지 않다 (2) 조금 중요하다 (3) 꽤 중요하다 (4) 매우 중요하다	4-1) 이유:
5.	**설득력을 높이기 위해 필요한 수사학적인 지식** **예**: 학술 논문을 쓰는 목적, 설득력(dynamics of persuasion)을 높이기 위한 방법, 독자가 논문을 읽는 목적과 기대하는 바, 학술 논문 저자로 적절한 위치 설정(positioning)하는 법에 대한 이해	1------2------3------4	5-1) 이유:
6.	**논문의 완성 과정 및 절차에 관련된 지식** **예**: 초안 및 수정안의 작성, 관련 연구와의 연관성에 대한 이해, 멘토 및 동료와의 의견 교환, 학술지 게재와 연계된 다른 활동(예: 편집자와의 서신교환, 학술발표)	1------2------3------4	6-1) 이유:
7.	**전공 분야 지식** **예**: 논문 주제에 대한 전문 지식, 논문 작성에 필요한 배경 지식과 세부 지식, 학술 지식의 창출 과정에 대한 이해	1------2------3------4	7-1) 이유:

8. 영어 학술 논문을 작성하는데 그 밖에 중요하다고 생각하는 점이 있으시면 적어주십시오:

아래 9 번부터 17 번 문항에 대해 도움이 필요하다고 느끼는 정도를 1(전혀 도움이 필요하지 않다)부터 4(매우 도움이 필요하다)로 표시하십시오. 답변에 대한 간단한 이유도 적어주시기 바랍니다.

귀하는 이 강좌에서 다음 **각 항목에 대해** 어느 정도 **도움이 필요하십니까**?

9.	논문의 관례화된 형식 및 규범(writing convention)	1------2------3------4 (1) 전혀 도움이 필요하지 않다 (2) 조금 도움이 필요하다 (3) 꽤 도움이 필요하다 (4) 매우 도움이 필요하다	9-1) 이유:
10.	영어 학술 논문의 필수적인 구성 및 내용	1------2------3------4	10-1) 이유:
11.	영어 학술 논문에 상용되는 어휘와 문법적 특징	1------2------3------4	11-1) 이유:
12.	학술 논문을 쓰는 목적과 설득력(dynamics of persuasion)을 높이기 위한 방법에 대한 이해	1------2------3------4	12-1) 이유:
13.	독자가 논문을 읽는 목적과 기대하는 바에 대한 이해	1------2------3------4	13-1) 이유:
14.	학술 논문 저자로 적절한 위치 설정(positioning)하는 법에 대한 이해	1------2------3------4	14-1) 이유:
15.	초안 및 수정안의 작성	1------2------3------4	15-1) 이유:
16.	기존 연구와의 연관성에 대한 이해 (기존 연구 인용의 목적 및 역할)	1------2------3------4	16-1) 이유:
17.	멘토 및 동료와의 의견 교환	1------2------3------4	17-1) 이유:

18. 본 강좌에서 그 밖에 도움이 필요하신 점이 있으면 적어주십시오:

19. 과거에 영어 논문 작성법을 수강하거나 관련 강의를 들어본 적이 있습니까? (해당 시)

1) 있다 ( )

2) 수강시기: 년 월

3) 주요 강의 내용:

20. 본 강좌를 수강함으로써 본인이 **배우고자 하거나 성취하고자 하는 바**는 무엇입니까? 아래 적어주시면 수업을 구성하는데 참고하도록 하겠습니다.

설문에 응해주셔서 감사합니다.

APPENDIX 4

Specialized Corpus Concordancing Worksheet Sample

AntConc Worksheet (answers italicized)

1. Figure 1 presents search results in concordance lines with the identical search word, which is hidden by ********.

Hit	KWIC		File
13	ıual contribution	*******—Humans and animals are capable of learning a new behavior by observing others perfo	DRL_Robotics Science ar
14	d Vijay Kumar	*******—In recent years, vision-aided inertial odometry for state estimation has matured signific	RBT_IEEE ROBOTICS ANC
15	Public Release	******* - Joint Air Operations (JAO) are traditionally orchestrated using static vehicle roles assigr	UA_A Vehicle-Target Sin
16	a ARTICLE INFO	******* Keywords: Mechanoluminescence Dislocation Photoluminescence Stress sensor Photonic	CI_Dislocation Mechanol
17	t, Hungary 2015	******* Many methods have been developed in recent years for the analysis and evaluation of	LD_J Therm Anal Calorim
18	ting Information	*******: The bottom-up prediction of the properties of polymeric materials based on molecular	MAMOBX_Macromolecu
19	e}@berkeley.edu	******* The design of a reward function often poses a major practical challenge to realworld	DRL_Advances in Neural
20	and Vijay Kumar	*******—There is extensive literature on using convex optimization to derive piece-wise polynon	MP_IEEE_2017_Liu_Planni
21	and Vijay Kumar	*******—There is extensive literature on using convex optimization to derive piece-wise polynon	RBT_IEEE Robotics n Aut
22	Antonio Franchi	*******—This letter presents a new method to address the problem of task-constrained motion	MP_IEEE_2018_Tognon_C
23	e Sciences 2019	******* This paper presents a new motion sensing algorithm for airborne synthetic aperture rada	GRS_International Journa
24	ısion, we present	*******—This paper presents two new, efficient solutions to the two-view, the results o	RBT_IEEE TRANSACTION
25	Heidelberg 2015	******* This paper presents a Matlab code for the opti- mal topology design of materials	SO_Structural and Multic
26	ide Scaramuzza1	*******.This paper presents a framework for collaborative localization and mapping with multipl	VN_IEEE_Collaborative M
27		******* We present a model to estimate motion from monocular visual and inertial meas	RBT_The International Jo
28	ur van den Berg	*******— We present Kinodynamic RRT*, an incremental sampling-based approach for asymptoti	MP_IEEE_2014_Webb_Kin
29	erque, NM, USA	*******—We present PRM-RL, a hierarchical method for long-range navigation task completion t	RBT_Int Conf on Robotic
30	rich, Switzerland	*******.With systems performing Simultaneous Localization And Mapping (SLAM) from a single	VN_IEEE_Multi UAV Colla

Figure 1. Concordance lines extracted from your specialized corpus

1) What would be the search word judging from the following words? Which section of a research article do you think will most likely begin as shown in Fig. 1? *Abstract*

2) What are the three noticeable patterns to begin this section? How are the verb tenses used in each pattern?

   Hits 13, 15, 18: *background info. (present tense)*

   Hits 14, 17: *recent/hot topic (present perfect)*

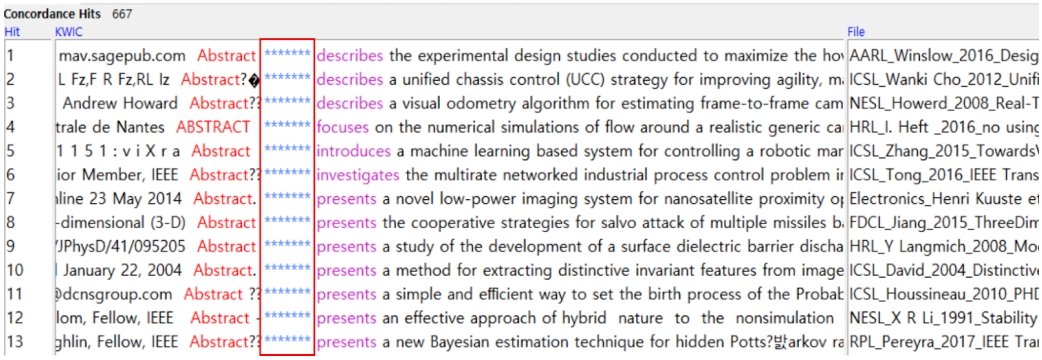
   Hit 19: *problematizing an issue*

   Hit 20: *review of previous works/centrality of the topic*

   Hits 22-26: *this paper presents*

   Hits 27-29: *We present*

2. Figure 2 shows thirteen concordance lines extracted from your specialized corpus. The concordance lines contain the identical search words, which is hidden by ****** as indicated in the red box.



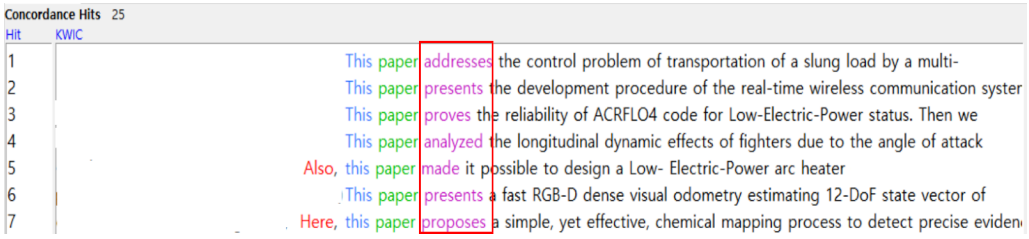
Concordance Hits 667

Hit	KWIC			File
1	mav.sagepub.com Abstract	*******	describes the experimental design studies conducted to maximize the ho	AARL_Winslow_2016_Desig
2	L Fz,F R Fz,RL lz Abstract?	*******	describes a unified chassis control (UCC) strategy for improving agility, m	ICSL_Wanki Cho_2012_Unifi
3	Andrew Howard Abstract??	*******	describes a visual odometry algorithm for estimating frame-to-frame cam	NESL_Howerd_2008_Real-T
4	trale de Nantes ABSTRACT	*******	focuses on the numerical simulations of flow around a realistic generic ca	HRL_I. Heft _2016_no usinc
5	1 1 5 1 : v i X r a Abstract	*******	introduces a machine learning based system for controlling a robotic mar	ICSL_Zhang_2015_Towards\
6	ior Member, IEEE Abstract??	*******	investigates the multirate networked industrial process control problem ir	ICSL_Tong_2016_IEEE Trans
7	line 23 May 2014 Abstract.	*******	presents a novel low-power imaging system for nanosatellite proximity op	Electronics_Henri Kuuste et
8	-dimensional (3-D) Abstract	*******	presents the cooperative strategies for salvo attack of multiple missiles b	FDCL_Jiang_2015_ThreeDim
9	JPhysD/41/095205 Abstract	*******	presents a study of the development of a surface dielectric barrier discha	HRL_Y Langmich_2008_Mo
10	January 22, 2004 Abstract.	*******	presents a method for extracting distinctive invariant features from image	ICSL_David_2004_Distinctiv
11	@dcnsgroup.com Abstract ??	*******	presents a simple and efficient way to set the birth process of the Probat	ICSL_Houssineau_2010_PHI
12	lom, Fellow, IEEE Abstract -	*******	presents an effective approach of hybrid nature to the nonsimulation	NESL_X R Li_1991_Stability
13	ghlin, Fellow, IEEE Abstract??	*******	presents a new Bayesian estimation technique for hidden Potts?발arkov ra	RPL_Pereyra_2017_IEEE Trai

Figure 2. Concordance lines extracted from a specialized corpus (word tokens: 1,207,918)

1) How many concordance hits does the missing search phrase display? How large are the word tokens? (***667; 1,207,918***)
2) What would be the missing phrase (two words) in the blanks marked by the red box in the concordance lines? Note that the lines are found at the beginning of the abstract of the research papers. (***This paper***)
3) Now, examine what kind of words follow the phrase in question. Write down the five verbs following the missing phrase. (***describes, focuses on, introduces, investigates, presents***)
4) What rhetorical function do you think the identified phrase plays in the abstract? (***what the paper does OR present research***)
5) Among the five combinations (i.e. the search words + verb (with or without a preposition)) you have identified in 3, write down at least one combination that you would like to use in your own abstract. (***Answers may vary.***)

3. Figure 3 presents seven concordance lines extracted from a learner corpus, the collection of research articles written by Korean graduate students in engineering. The seven lines contain the search words "this paper" preceding the red box (*The answers are given in italics included in parentheses*).



Concordance Hits 25

Hit	KWIC
1	This paper addresses the control problem of transportation of a slung load by a multi-
2	This paper presents the development procedure of the real-time wireless communication syster
3	This paper proves the reliability of ACRFLO4 code for Low-Electric-Power status. Then we
4	This paper analyzed the longitudinal dynamic effects of fighters due to the angle of attack
5	Also, this paper made it possible to design a Low- Electric-Power arc heater
6	This paper presents a fast RGB-D dense visual odometry estimating 12-DoF state vector of
7	Here, this paper proposes a simple, yet effective, chemical mapping process to detect precise eviden

Figure 3. Concordance lines extracted from a learner corpus (word tokens: 8,821)

1. How many concordance hits did the missing search words get? How large are the word tokens? ***25; 8,821***

2. Examine the verbs in the red box. Compared to Figure 1, what are the features that are also found in Figure 2? ***the use of verb such as present***

3. What are the features that are only found in Figure 2? Pay attention to the tense of the listed verbs. ***The past tense is used in hits 4-5***

3. Based on the comparison between Figure 1 and 2, what can you infer about the appropriate tense to use in the abstract?

The samples from the specialized corpus all display the present tense whereas those from a learner corpus are not consistent with the use of tense; therefore, it is likely that the more common tense to be used in the abstract could be the present tense.

APPENDIX 5

Model Paper Analysis Worksheet Sample (Completed by Sujong)

개별 모델 논문 분석표(서론) Individual Task of Analyzing Model Papers (Introduction)

1. 본인이 선정한 모델 논문의 파일 제목 (세부전공 약자_학술지명_출판년도_제1저자의 성)
The file name of your model paper PDF (your field_journal title__publication year_last name of 1st author):

1) ***_*The* **** *journal_2011_Henderson*

2) ***_**** *Journal_2009_Kitamura*

2. 본인의 모델 논문에서 결과 부분은 보통 몇 개의 문단 혹은 문장으로 구성되어 있습니까?

How many paragraphs consist of the Discussion/Conclusion of your model paper(s)?

문단 수(number of paragraphs): 약(approx.) *4 ~ 8*

문장 수 (number of sentences): 약(approx.) *32 ~ 40*

3. 본인이 분석한 모델 논문의 서론 부분에 나타난 흐름을 표1 (2페이지)에 학자별로 정리된 **이동 마디(moves) 및 단계(steps)**를 선택 혹은 참고하여 표2 (3페이지)에 정리하세요. 꼭 한 학자의 체계를 따를 필요는 없으며, 본인의 분석에 따라 여러 학자들의 용어를 선별적으로 사용하거나 본인이 이해하기 쉽도록 본인만의 용어로 정리해도 무방합니다. Referring to or selecting basic **moves and steps** in the Introduction labelled by different scholars in Table 1 (p.2), streamline the Introduction of your model paper(s) in Table 2 (p. 3). You do not need to confine your analysis to one framework; you may selectively choose relevant terms from different scholars. If necessary, you may also use your own terms for your convenience.

Table 2. Streamlined Introduction of your Model Paper(s)

	Model paper 1	Model paper 2
Move (communicative purpose & indication of content) and/or Step (rhetorical function & communicative intent)	***Move 1*** *Establishing a territory* ***Step 1*** *Claiming centrality and/or* ***Step 2*** *Making topic generalization(s) and/or* ***Step 3*** *Reviewing items of previous research* ***Move 2*** *Establishing a niche* ***Step 1*** *Indicating a gap (something is missing)* ***Move 3*** *Presenting the present work* ***Step 1-1*** *Announcing present research descriptively* ***Step 1-2*** *Announcing present research purposively* ***Step 2*** *Definitional clarifications* ***Step 3*** *summarizing methods* ***Step 4*** *Announcing principal outcomes* ***Step 5*** *Outlining the structure of the paper*	***Move 1*** *Establishing a territory* ***Step 1*** *Claiming centrality and/or* ***Step 2*** *Reviewing items of previous research* ***Move 2*** *Establishing a niche* ***Step 1*** *Continuing a tradition (something is missing)* ***Move 3*** *Presenting the present work* ***Step 1*** *Announcing present research descriptively* ***Step 2*** *Definitional clarifications* ***Step 3*** *summarizing methods* ***Step 4*** *Announcing principal outcomes*

조별 분석표(서론) Team Task (Introduction)

1. 개별 모델 논문 분석표에서 각자 정리한 표2를 조원들과 비교해보고 **공통점**이나 **차이점**이 있는지 논의하십시오. 토론을 통해 학술 논문 서론 부분의 구조 및 구성요소(*i.e.* moves and steps)에 대해 **배운점**이나 **생각해볼 만한 문제**를 정리하여 적으십시오. 예컨대, 서론의 구조나 구성요소가 학술 분야의 특징, 학술지의 주요 독자나 목적과 어떻게 연결되는지와 같은 내용이나, 토론의 방향에 따라 다른 내용을 적어도 무방합니다. Compare your Table 2 in your individual task above with those of your group members to discuss **any similarities or differences**. Write down **any lessons** learned or **questions** to ponder over while discussing the essential moves and steps of the Introduction section in your field. Examples may include, but not limited to, how the structure and components are related to the nature of the field or the audience and purpose of the journal.

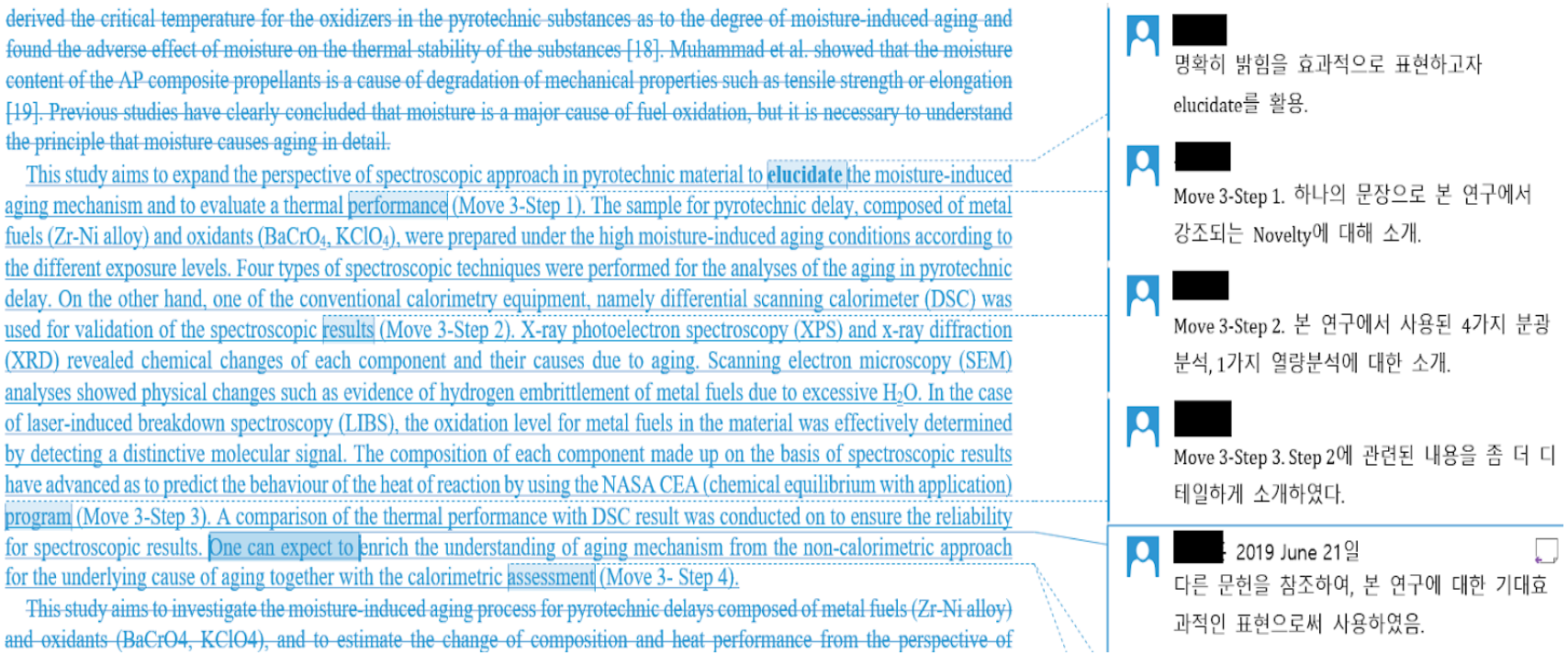
2. 본인이 서론 초안에 작성하고 싶은 필수적인 혹은 유용한 문법구조나 뼈대표현을 그 기능과 함께 정리한 후, 본인의 문장으로 써보십시오 (문장 1~3개).
Write down any essential or useful skeletal phrase(s) and their communicative purpose(s) that you want to write in your draft (Introduction). Write your own sentence(s) including the phrase(s) (1~3 sentences).

초안에 쓰고 싶은 유용한 문법구조나 뼈대 표현 Useful grammatical structure or skeletal phrases for your draft (Discussion/Conclusion)	*Has become a major of ~,* *Has been increasing,* *Has become critical in*	*The net result still be an absolute increase ~*	*Have become increasing challenging ~,* *Has proved surprisingly troublesome on account of ~*	*Will pay particular attention to ~*
위의 문법이나 뼈대 표현은 어떤 기능을 하는가? What are the communicative purposes of these skeletal phrases?	*어떤 특정 개념이나 현상이 점점 대두되거나 중요하게 다루어질 때 사용되는 표현으로 서론 초반부에 등장하는 claiming centrality 같은 step에서 사용할 수 있는 표현*	*특정 현상이나 효과를 억제하기 위해 이전에 어떤 조치를 취했음에도 결과가 달라지지 않았을 때 사용할 수 있는 표현으로 서론 중간 부에서 niche를 탐색할 때 기존 연구의 한계점을 드러낼 때 사용하면 유용할 것으로 판단 됨.*	*Establishing a niche move에서 기존의 기법으로는 더 이상 진보나 성장의 한계에 다다랐을 때 사용할 수 있는 표현으로 기존 기법이나 방법들을 비판하고 해당 논문에서 새로 제시할 개념이나 기법의 필요성을 부각시킬 수 있는 문장을 이어서 써주면 좋은 흐름을 만들 수 있을 것으로 예상 됨.*	*서론 후반부에서 해당 논문이 어떤 부분에 초점을 맞추어 연구를 수행할 것인지 나열 및 요약하는 부분에 응용할 수 있는 표현이라고 생각 함.*
표현이 들어간 문장 작문 Write your own sentence(s) including the phrase(s) (at least 1).	*The advent of new method has become critical in commercial design project.*	*Although to suppress the upturn, a lot of special measures are executed, the net result will still be an absolute increase.*	*The exact computation of hypersonic flows has proved surprisingly troublesome on account of unphysical phenomenon.*	*The research team pays particular attention to those schemes.*

APPENDIX 6

Students' Self-Annotated Writing Examples

Johan's Descriptive and Analytical Annotations on Moves and Lexical Choices (Introduction)



derived the critical temperature for the oxidizers in the pyrotechnic substances as to the degree of moisture-induced aging and found the adverse effect of moisture on the thermal stability of the substances [18]. Muhammad et al. showed that the moisture content of the AP composite propellants is a cause of degradation of mechanical properties such as tensile strength or elongation [19]. Previous studies have clearly concluded that moisture is a major cause of fuel oxidation, but it is necessary to understand the principle that moisture causes aging in detail.

This study aims to expand the perspective of spectroscopic approach in pyrotechnic material to **elucidate** the moisture-induced aging mechanism and to evaluate a thermal performance (Move 3-Step 1). The sample for pyrotechnic delay, composed of metal fuels (Zr-Ni alloy) and oxidants ($BaCrO_4$, $KClO_4$), were prepared under the high moisture-induced aging conditions according to the different exposure levels. Four types of spectroscopic techniques were performed for the analyses of the aging in pyrotechnic delay. On the other hand, one of the conventional calorimetry equipment, namely differential scanning calorimeter (DSC) was used for validation of the spectroscopic results (Move 3-Step 2). X-ray photoelectron spectroscopy (XPS) and x-ray diffraction (XRD) revealed chemical changes of each component and their causes due to aging. Scanning electron microscopy (SEM) analyses showed physical changes such as evidence of hydrogen embrittlement of metal fuels due to excessive H_2O. In the case of laser-induced breakdown spectroscopy (LIBS), the oxidation level for metal fuels in the material was effectively determined by detecting a distinctive molecular signal. The composition of each component made up on the basis of spectroscopic results have advanced as to predict the behaviour of the heat of reaction by using the NASA CEA (chemical equilibrium with application) program (Move 3-Step 3). A comparison of the thermal performance with DSC result was conducted on to ensure the reliability for spectroscopic results. One can expect to enrich the understanding of aging mechanism from the non-calorimetric approach for the underlying cause of aging together with the calorimetric assessment (Move 3- Step 4).

This study aims to investigate the moisture-induced aging process for pyrotechnic delays composed of metal fuels (Zr-Ni alloy) and oxidants (BaCrO4, KClO4), and to estimate the change of composition and heat performance from the perspective of

[redacted]
명확히 밝힘을 효과적으로 표현하고자 elucidate를 활용.

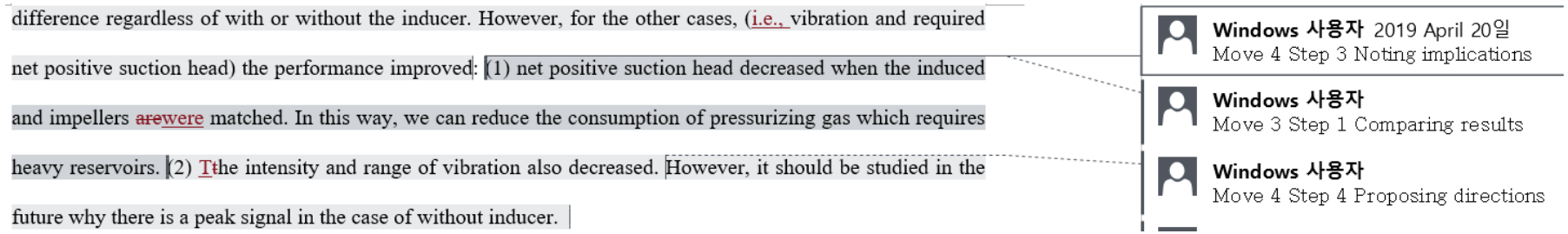
[redacted]
Move 3-Step 1. 하나의 문장으로 본 연구에서 강조되는 Novelty에 대해 소개.

[redacted]
Move 3-Step 2. 본 연구에서 사용된 4가지 분광분석, 1가지 열량분석에 대한 소개.

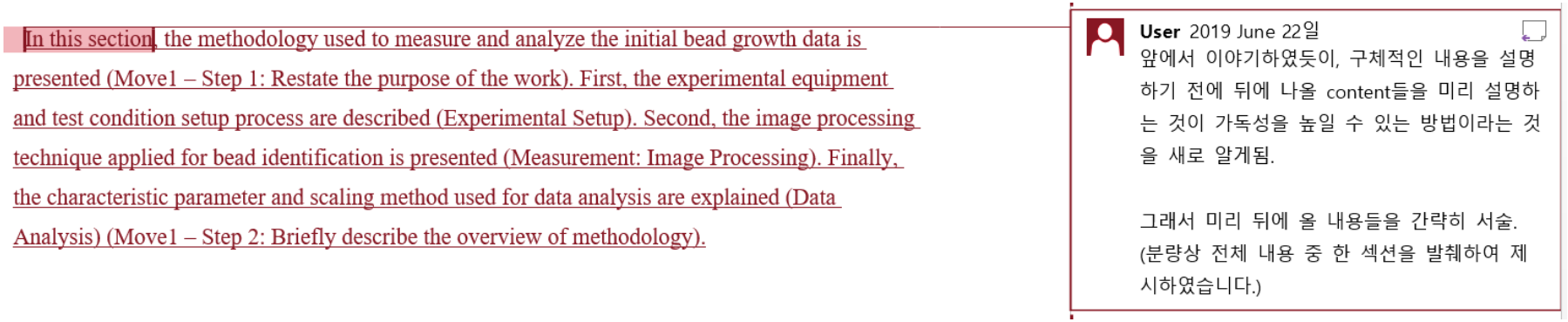
[redacted]
Move 3-Step 3. Step 2에 관련된 내용을 좀 더 디테일하게 소개하였다.

[redacted] 2019 June 21일
다른 문헌을 참조하여, 본 연구에 대한 기대효과적인 표현으로써 사용하였음.

Jitak's Descriptive Annotations on Moves and Steps (Results)



Sutek's Analytical Annotation on Adding an Overview Paragraph for Improving Reader-friendliness (Methods)



APPENDIX 7

Semi-Structured Student Interview Questions

Commonly asked questions in the midterm interviews

1. Do you have any questions about the class assignments you have done so far?
2. We have gone through one cycle of the curriculum. How do you find the class components so far? (i.e., reviewing model paper analyses from previous terms in class - individual model paper analysis - group discussion - drafting - revising after receiving feedback).
3. Did you find any class component useful, in particular, for your learning of the research paper genre?
4. Did you have any difficulty with any class component? If so, what do you think makes it difficult to engage in?
5. If you could revise the current curriculum, what suggestions would you make for a more effective learning?

Commonly asked questions in the final interviews

1. Among the four class components, namely 1) individual model paper analysis, 2) group discussion, 3) composition and annotation tasks, and 4) feedback, which was most helpful and least helpful to you? and why?
2. Do you think the move/steps analysis learned during this course helped you understand the structure of a research paper? Do you think it also helped you with your writing? Why do you think so?
3. Do you think you have achieved what you want to learn or achieve through this course?

APPENDIX 8

Final Survey Questionnaire (IRB No. 1902/003-001)

IRB No. 1902/003-001 유효기간: 2020년 2월 14일

학기말 설문지

본 설문은 본 강좌의 수강을 마친 학생들의 영어 학술 논문에 대한 지식과 영작문 실력에 대한 인식의 변화 여부를 조사하기 위해 실시합니다. 성의껏 응답해주시면 정확한 연구 결과를 도출할 수 있게 되어 그 결과를 바탕으로 보다 유용한 강좌를 개발하는데 도움이 될 것입니다. 설문지에 작성한 내용은 평가 및 학점에 영향을 미치지 않을 것이며 학점 부여 후에 분석될 예정입니다.

먼저 아래 **본인의 학번**과 한 학기 동안 온라인에 제출해야 한 **총 과제 대비 강사의 피드백을 읽은 비율**을 표시한 후 설문에 응하십시오. (총 40 문항).

학번: _____ 온라인 피드백을 읽은 비율을 표시하세요: 0%-----25%-----50%-----100%

아래 1번-33번 문항에는 한 학기 동안 본 강좌에서 수행한 과제 및 수업 활동이 본인의 학술 논문에 대한 지식 및 영작문 향상에 도움을 준 정도를 1 (전혀 도움이 되지 않았다)부터 4 (매우 도움이 되었다)로 표시하십시오. 답변에 대한 이유도 간단히 적어주시기 바랍니다.

학술 논문의 관례화된 형식 및 규범에 대한 지식(writing convention)을 익히는데에 다음의 각 활동이 도움이 되었습니까?

1.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	1-1) 이유:
2.	작문 및 주석 달기 과제	1------2------3------4	2-1) 이유:
3.	온라인 피드백 (유사도 검사, 자동 문법 오류 점검, 강사 피드백)	1------2------3------4	3-1) 이유:

Version 1.1(2019.2.15.)

학술 논문의 필수적인 구성(moves or steps)과 그 **기능(communicative purposes)**에 대한 지식을 익히는데에 다음의 각 활동이 도움이 되었습니까?

4.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	4-1) 이유:
5.	작문 및 주석 달기	1------2------3------4	5-1) 이유:
6.	온라인 피드백 (유사도 검사, 자동 문법 오류 점검, 강사 피드백)	1------2------3------4	6-1) 이유:

학술 논문에 상용되는 어휘와 문법적 특징(lexico-grammatical features)에 대한 지식을 익히는데에 다음의 각 활동이 도움이 되었습니까?

7.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	7-1) 이유:
8.	작문 및 주석 달기	1------2------3------4	8-1) 이유:
9.	온라인 피드백	1------2------3------4	9-1) 이유:

학술 논문을 쓰는 목적과 설득력(dynamics of persuasion)을 높이기 위한 방법을 이해하는데에 다음의 각 활동이 도움이 되었습니까?

10.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	10-1) 이유:
11.	작문 및 주석 달기	1------2------3------4	11-1) 이유:
12.	온라인 피드백 (유사도 검사, 자동 문법 오류 점검, 강사 피드백)	1------2------3------4	12-1) 이유:

독자가 논문을 읽는 목적과 기대하는 바를 이해하는데에 다음의 각 활동이 도움이 되었습니까?

13.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	13-1) 이유:
14.	작문 및 주석 달기	1------2------3------4	14-1) 이유:
15.	온라인 피드백	1------2------3------4	15-1) 이유:

학술 논문 저자로 적절한 위치 설정(positioning) 하는 방법을 이해하는데에 다음의 각 활동이 도움이 되었습니까?

16.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	16-1) 이유:
17.	작문 및 주석 달기	1------2------3------4	17-1) 이유:
18.	온라인 피드백 (유사도 검사, 자동 문법 오류 점검, 강사 피드백)	1------2------3------4	18-1) 이유:

초안 및 수정안의 작성을 하는데에 다음의 각 활동이 도움이 되었습니까?

19.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	19-1) 이유:
20.	작문 및 주석 달기	1------2------3------4	20-1) 이유:
21.	온라인 피드백	1------2------3------4	21-1) 이유:

기존 연구와의 연관성(기존 연구 인용의 목적 및 역할)을 이해하는데에 다음의 각 활동이 도움이 되었습니까?

22.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	22-1) 이유:
23.	작문 및 주석 달기	1------2------3------4	23-1) 이유:
24.	온라인 피드백 (유사도 검사, 자동 문법 오류 점검, 강사 피드백)	1------2------3------4	24-1) 이유:

멘토 및 동료와의 의견 교환을 하는데에 다음의 각 활동이 도움이 되었습니까?

25.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	25-1) 이유:
26.	작문 및 주석 달기	1------2------3------4	26-1) 이유:
27.	온라인 피드백	1------2------3------4	27-1) 이유:

학술 논문 작성에 필요한 전공 분야 지식을 익히는데에 다음의 각 활동이 도움이 되었습니까?

28.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	28-1) 이유:
29.	작문 및 주석 달기	1------2------3------4	29-1) 이유:
30.	온라인 피드백 (유사도 검사, 자동 문법 오류 점검, 강사 피드백)	1------2------3------4	30-1) 이유:

학술 논문을 작성하는데 필요한 **영어 작문 실력을 향상**시키는데에 다음의 각 활동이 **도움이 되었습니까**?

31.	모델 학술 논문 분석 후 멘토 및 동료와 토의	1------2------3------4 (1) 전혀 도움되지 않았다 (2) 조금 도움이 되었다 (3) 꽤 도움이 되었다 (4) 매우 도움이 되었다	31-1) 이유:
32.	작문 및 주석 달기	1------2------3------4	32-1) 이유:
33.	온라인 피드백	1------2------3------4	33-1) 이유:

코퍼스 검색 도구

귀하는 한 학기 동안 초고 및 수정안을 작성하는 과정에서 활용할 수 있도록 주어진 학술 논문 모음 코퍼스를 검색할 수 있는 프로그램(AntConc), MICUSP, 그리고 Google Scholar 검색 기능에 대해 안내를 받았습니다.

34. 위 코퍼스 검색 도구들을 작문이나 수정하는 과정에서 얼마나 활용하였습니까?

1----------2----------3----------4

(1) 전혀 활용하지 않았다, (2) 조금 활용했다, (3) 꽤 활용했다, (4) 많이 활용했다.

34-1) 위 34번에서 2(조금 활용했다) 이상으로 답변을 한 경우, 아래 코퍼스 검색 도구 중 가장 많이 활용한 도구는 무엇입니까? (중복 선택 가능)

1) AntConc
2) MICUSP
3) Google Scholar

35. 주로 어떤 목적으로 각각의 도구를 사용했는지, 혹은 왜 자주 사용하지 않았는지 간단히 적어주십시오.

1) AntConc

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2) MICUSP

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3) Google Scholar

36. 아래 항목 중 한 학기 동안 본인의 **영어 학술 논문에 대한 지식이나 작문 능력을 향상시키는데** 전반적으로 **가장 도움이 된 것**은 무엇입니까? (중복 선택 가능) 답변에 대한 이유도 간단히 적어주시기 바랍니다.

1) 모델 분석 과제 및 조별 토의 활동 36-1) 이유:
2) 작문 및 주석 활동
3) 온라인 피드백
4) 코퍼스 검색 도구
5) 기타:

한 학기 동안 본 강좌를 수강하면서 다음 각 항목에 대해 느낀 정도를 1(전혀 그렇지 않다)부터 4(매우 그렇다)로 표시하십시오. 답변에 대한 이유도 간단히 적어주시기 바랍니다.

37. 영어 학술 논문 작성에 대한 전반적인 **인식이 달라졌다.** 1------2------3------4 37-1) 이유:

(1) 전혀 그렇지 않다
(2) 조금 그렇다
(3) 꽤 그렇다
(4) 매우 그렇다

38. 영어 학술 논문 작성에 필요한 전반적인 **지식이 발전되었다.** 1------2------3------4 38-1) 이유:

39. 영어 학술 논문에 대한 전반적인 **작성 실력이 발전되었다.** 1------2------3------4 39-1) 이유:

40. 마지막으로 본 강좌를 **수강하면서 좋았던 점**과 추후 **개선되면 좋을 점**에 대해 적어주십시오.

1) 좋았던 점

2) 개선되면 좋을 점

설문에 응해주셔서 감사합니다.

Version 1.1(2019.2.15.)

REFERENCES

Ahmad, U. K. (1997). Research article introductions in Malay: Rhetoric in an emerging research community. In A. Duszak (Ed.), *Culture and styles of academic discourse* (pp. 273-303). Berlin: Mouton de Gruyter.

Alinasab, M., Gholami, J., & Mohammadnia, Z. (2021). Genre-based revising strategies of graduate students in applied linguistics: Insights from term papers. *Journal of English for Academic Purposes*, *49*, 1-13.

Ammon, U. (2001). *The dominance of English as a language of science: Effects on other languages and language communities.* New York: Mouton de Gruyter.

Ammon, U. (2003). Global English and the non-native speaker: Overcoming disadvantage. In H. Tonkin & T. Reagan (Eds.), *Language in the twenty-first century* (pp. 23-34). Philadelphia, PA: John Benjamins.

Anthony, L. (2018). *AntConc* (Version 3.5.0). [Computer Software]. https://www.laurenceanthony.net/

Assadi, M. (2018). Enhancing Iranian EFL Learners' Descriptive Writing Through a Genre-based Pedagogy. *International Journal of Applied Linguistics and English Literature, 7*(6), 123-128.

Atkinson, D. (2003). L2 writing in the post-process era: Introduction. *Journal of second language writing, 12*(1), 3-15.

Bawarshi, A. S. & Reiff, M. J. (2010). *Genre: An introduction to history, theory, research, and pedagogy*. West Lafayette, IN: Parlor Press.

Beer, D. F., & McMurrey, D. A. (2019). *A guide to writing as an engineer* (5th ed.). Hoboken, NJ: John Wiley & Sons.

Beaufort, A. (2007). *College writing and beyond: A new framework for university writing instruction.* Logan, UT: Utah State University Press.

Belcher, D. (2004). Trends in teaching English for Specific Purposes. *Annual Review of Applied Linguistics, 24*, 165-186

Belcher, D., & Connor, U. (2001). *Reflections on multiliterate lives*. Clevedon, UK: Multilingual Matters.

Benesch, S. (2001). *Critical English for academic purposes: Theory, politics, and practice*. New York: Routledge.

Berkenkotter, C., & Huckin, T. N. (2016). *Genre knowledge in disciplinary communication: Cognition/culture/power*. New York: Routledge.

Berkenkotter, C., Huckin, T. N., & Ackerman, J. (1988). Conventions, conversations, and the writer: Case study of a student in a Ph. D. program. *Research in the Teaching of English*, *22*(1), 9-44.

Bhatia, V. K. (1993). *Analysing genre: Language use in professional settings*. New York: Routledge.

Bloch, J. (2003). Creating materials for teaching evaluation in academic writing: Using letters to the editor in L2 composition courses. *English for Specific Purposes, 22*(4), 347-364.

Brent, D. (2012). Crossing boundaries: Co-op students relearning to write. *College Composition and Communication, 63*(4), 558-592.

Brown, J. D. (2001). *Using surveys in language programs.* New York: Cambridge university press.

Brown, J. D., & Coombe, C. A. (2015). *The Cambridge guide to research in language teaching and learning.* New York: Cambridge University Press.

Brown, P., Levinson, S. C., & Levinson, S. C. (1987). *Politeness: Some universals in language usage* (Vol. 4). New York: Cambridge University Press.

Cargill, M., & O'Connor, P. (2006). Developing Chinese scientists' skills for publishing in English: evaluating collaborating-colleague workshops based on genre analysis. *Journal of English for Academic Purposes, 5*(3), 207-221.

Canagarajah, S. (2002). Multilingual writers and the academic community: Towards a critical relationship. *Journal of English for Academic Purposes, 1*(1), 29-44.

Carter, M., Ferzli, M., & Wiebe, E. (2004). Teaching genre to English first-language adults: A study of the laboratory report. *Research in the Teaching of English*, *38*(4), 395-419.

Chang, J.-Y. (2011). *The use of general and specialized corpora as reference tools for academic and technical English writing: A case study of Korean graduate students of engineering* [Unpublished doctoral dissertation]. Seoul National University.

Chang, J.-Y. (2013). Korean graduate engineering students' evaluations of feedback from a specialized corpus on academic English writing. *Korean Journal of Applied Linguistics, 29*(1), 245-271.

Chang, J.-Y. (2014). The use of general and specialized corpora as reference sources for academic English writing: A case study. *ReCALL, 26*(2), 243-259.

Chang, C.-F., & Kuo, C.-H. (2011). A corpus-based approach to online materials development for writing research articles. *English for Specific Purposes, 30*(3), 222-234.

Charles, M. (2007). Reconciling top-down and bottom-up approaches to graduate writing: Using a corpus to teach rhetorical functions. *Journal of English for Academic Purposes*, *6*(4), 289-302.

Chen, Y-S., & Su, S-W. (2011). A genre-based approach to teaching EFL summary writing. *ELT Journal, 66*(2), 184-192.

Cheng, A. (2005). *Genre and learning: Exploring learners and learning in the ESP genre framework of learning academic writing* (Publication No. 3187489) [Doctoral dissertation, Pennsylvania State University]. ProQuest Dissertations

Publishing.

Cheng, A. (2006). Analyzing and enacting academic criticism: The case of an L2 graduate learner of academic writing. *Journal of Second Language Writing*, *15*(4), 279-306.

Cheng, A. (2007). Transferring generic features and recontextualizing genre awareness: Understanding writing performance in the ESP genre-based literacy framework. *English for Specific Purposes*, *26*(3), 287-307.

Cheng, A. (2008). Individualized engagement with genre in academic literacy tasks. *English for Specific Purposes*, *27*(4), 387-411.

Cheng, A. (2011). Language features as the pathways to genre: students' attention to nonprototypical features and its implications. *Journal of Second Language Writing*, *20*(1), 69-82.

Cheng, A. (2015). Genre analysis as a pre-instructional, instructional, and teacher development framework. *Journal of English for Academic Purposes*, *19*, 125-136.

Cheng, A. (2018). *Genre and graduate-level research writing*. Ann Arbor, MI: University of Michigan Press.

Cho, D. W. (2006). A case study of a college freshman English program designed to boost writing skills. *Foreign Languages Education*, *13*(2), 69-91.

Cho, D. W. (2009). Science journal paper writing in an EFL context: The case of

Korea. *English for specific purposes*, *28*(4), 230-239.

Chyung, S. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-based survey design: The use of a midpoint on the Likert scale. *Performance Improvement, 56*(10), 15-23.

Gilmore, A. (2009). Using online corpora to develop students' writing skills. *ELT Journal, 63*(4), 363-372.

Coe, R. M. (2002). The new rhetoric of genre: Writing political briefs. In A. Johns (Ed.), *Genre in the classroom: Multiple perspectives,* (pp. 197-207). Mahwah, NJ: Lawrence Erlbaum Associates.

Coffey, B. (1984). ESP-English for specific purposes [State-of-the-art article]. *Language Teaching: The International Abstracting Journal for Language Teachers and Applied Linguists, 17*, 2-16.

Cotos, E. (2017). Language for specific purposes and corpus-based pedagogy. In C. A. Chapelle & S. Sauro (Eds.), *The Handbook of technology and second language teaching and learning*, (pp. 248-264). Hoboken, NJ: John Wiley & Sons.

Cotos, E., Huffman, S., & Link, S. (2015). Furthering and applying move/step constructs: Technology-driven marshalling of Swalesian genre theory for EAP pedagogy. *Journal of English for Academic Purposes*, *19*, 52-72.

Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage.

Cumming, A. (1989). Writing expertise and second-language proficiency, *Language Learning, 39*(1), 81-141.

Cummins, J. (2000). *Language, power and pedagogy: Bilingual children in the crossfire*. Toronto: Multilingual Matters.

Curry, M. J., & Lillis, T. (2017). Problematizing English as the privileged language of academic publishing. In M. J. Curry & T. Lillis (Eds.), *Global academic publishing: Policies, perspectives and pedagogies* (pp. 1-20). Toronto: Multilingual Matters.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine de Gruyter.

Devitt, A. J. (2004). *Writing genres*. Carbondale, IL: Southern Illinois University Press.

Devitt, A. J. (2009). Re-fusing form in genre study. In J. Giltrow & D. Stein (Eds.), *Genres in the Internet: Issues in the theory of genre* (pp. 27-48). Philadelphia, PA: John Benjamins Publishing.

Devitt, A. J. (2015). Genre performances: John Swales' Genre Analysis and rhetorical-linguistic genre studies. *Journal of English for Academic Purposes, 19*, 44-51.

Dudley-Evans, T. (1986). Genre analysis: An investigation of the introduction and discussion sections of M.Sc. dissertations. In M. Coulthard (Ed.), *Talking about text* (pp. 128-145). University of Birmingham.

Feez, S. (2002). Heritage and innovation in second language education. In A. Johns (Ed.), *Genre in the classroom: Multiple perspectives* (pp. 43-72). Mahwah, NJ: Lawrence Erlbaum.

Flowerdew, J. (1993). An educational, or process, approach to the teaching of professional genres. *ELT journal*, *47*(4), 305-316.

Flowerdew, J. (2002). Genre in the classroom: A linguistic approach. In A. M. Johns (Ed.), *Genre in the classroom: Multiple perspectives* (pp. 91-102). Mahwah, NJ: Lawrence Erlbaum.

Flowerdew, L. (2005). An integration of corpus-based and genre-based approaches to text analysis in EAP/ESP: Countering criticisms against corpus-based methodologies. *English for Specific Purposes*, *24*(3), 321-332.

Flowerdew, L. (2016). A genre-inspired and lexico-grammatical approach for helping postgraduate students craft research grant proposals. *English for Specific Purposes*, *42*, 1-12.

Freedman, A. (1993). Show and tell? The role of explicit teaching in the learning of new genres. *Research in the Teaching of English, 27*(3), 222-251.

Freedman, A. (1994). “Do as I said”: the relationship between teaching and learning

new genres. In A. Freedman, & P. Medways (Eds.), *Genre and the new rhetoric* (pp. 191-210). London: Taylor & Francis.

Freedman, A., & Richardson, P. (1997). Literacy and genre. In L. van Lier, & D. Corson (Eds.), *Knowledge about language: Encyclopedia of language and education* (vol. 6. pp. 139-149). MA: Kluwer Academic Publishers.

Gentil, G. (2005). Commitments to academic biliteracy: Case studies of francophone university writers. *Written Communication, 22,* 421-471.

Gentil, G. (2011). A biliteracy agenda for genre research. *Journal of Second Language Writing*, *20*(1). 6-23.

Glasman-Deal, H. (2020). *Science research writing: For native and non-native speakers of English* (2nd ed.). NJ: World Scientific.

Henry, A., & Roseberry, R. L. (1997). An investigation of the functions, strategies and linguistic features of the introductions and conclusions of essays. *System, 25*(4), 479-495.

Henry, A., & Roseberry, R. L. (1998). An evaluation of a genre-based approach to the teaching of EAP/ESP writing. *TESOL Quarterly, 32*, 147-156.

Hirvela, A. (2004). *Connecting reading & writing in second language writing instruction.* Ann Arbor, MI: University of Michigan Press.

Hoey, M. (2001). *Textual interaction: An introduction to written discourse analysis*. New York: Routledge.

Hong, Y. J., & Lee, C.M. (2011). A comparison of professors' and students' needs analysis of the English program for engineering students at university level. *Korean Journal of Applied Linguistics*, *27*(1), 131-165.

Hopkins, A., & Dudley-Evans, T. (1988). A genre-based investigation of the discussion sections in articles and dissertations. *English for Specific Purposes, 7*(2), 113-121.

Huang, J. C. (2010). Publishing and learning writing for publication in English: perspectives of NNES PhD students in science. *Journal of English for Academic Purposes, 9*, 33-44.

Huang, J. C. (2014). Learning to write for publication in English through genre-based pedagogy: A case in Taiwan. *System*, *45*(1), 175-186.

Huang, J. C. (2018). Marine engineering and sub-disciplinary variations: a rhetorical analysis of research article abstracts. *Text & Talk*, *38*(3), 341-363.

Hyland, K. (1998). *Hedging in scientific research articles* (vol. 54). Amsterdam: John Benjamins Publishing Company.

Hyland, K. (1999). Academic attribution: Citation and the construction of disciplinary knowledge. *Applied linguistics, 20*(3), 341-367.

Hyland, K. (2002). Genre: Language, context, and literacy. *Annual Review of Applied Linguistics, 22*(1), 113-135.

Hyland, K. (2003). Genre-based pedagogies: A social response to process. *Journal of Second Language Writing*, *12*, 17-29.

Hyland, K. (2004). *Genre and second language writing*. Ann Arbor, MI: University of Michigan Press.

Hyland, K. (2005). *Metadiscourse: Exploring interaction in writing*. New York: Continuum.

Hyland, K. (2007). Genre pedagogy: Language, literacy, and L2 writing instruction. *Journal of Second Language Writing*, *16*, 148-164.

Hyland, K. (2016). Academic publishing and the myth of linguistic injustice. *Journal of Second Language Writing*, *31*, 58-69.

Hyon, S. (1996). Genre in three traditions: Implications for ESL. *TESOL Quarterly*, *30*(4), 693-722.

Hyon, S. (2001). Long-term effects of genre-based instruction: A follow-up study of an EAP reading course. *English for Specific Purposes, 20*, 417-438.

Hyon, S. (2002). Genre and ESL reading: A classroom study. In A. M. Johns (Ed.), *Genre in the classroom: Multiple perspectives* (pp. 121-141). Mahwah, NJ: Lawrence Erlbaum.

Hyon, S. (2017). *Introducing genre and English for specific purposes.* New York: Routledge.

Johns, A. M. (1997). *Text, role and context: Developing academic literacies.* New York: Cambridge University Press.

Johns, A. M. (2002). Destabilizing students' literacy theories. In A. M. Johns (Ed.), *Genre in the classroom: Multiple perspectives* (pp. 237-248). Mahwah, NJ: Lawrence Erlbaum.

Johns, A. M. (2008). Genre awareness for the novice academic student: An ongoing quest. *Language Teaching, 41*(2), 237-252.

Johns, A. M. (2011). The future of genre in L2 writing: Fundamental, but contested, instructional decisions. *Journal of Second Language Writing, 20*(1), 56-68.

Johns, A. M. (2012). Genre and ESL/EFL composition instruction. In Kroll, B. (Ed.), *Exploring the dynamics of second language writing* (pp. 195-217). Cambridge: Cambridge Applied Linguistics.

Johns, R. (2005) One size doesn't fit all: Selecting response scales for attitude items. *Journal of Elections*, *15*(2), 237-264

Jwa, S. (2015). *Genre knowledge development: Tracing trajectories of L2 writers' transitions to different disciplinary expectations in college writing* (Publication No. 3701083) [Doctoral dissertation, University of Arizona]. ProQuest Dissertations Publishing.

Jwa, S. (2019). Transfer of knowledge as a mediating tool for learning: Benefits and challenges for ESL writing instruction. *Journal of English for Academic Purposes*, *39*, 109-118.

Kennedy, C., & Miceli, T. (2017). Cultivating effective corpus use by language learners. *Computer Assisted Language Learning*, *30*(91-2), 91-114.

Kessler, M. J. (2020). *Teaching and learning in a content-based classroom: understanding pedagogy and the development of L2 writers' metacognitive genre awareness* (Publication No. 28021909) [Doctoral dissertation, Michigan State University]. ProQuest Dissertations Publishing.

Kessler, M. J. (2021). The longitudinal development of second language writers' metacognitive genre awareness. *Journal of Second Language Writing*, *53,* 100832.

Kim, A. Y. A., & Kim, H. J. (2017). The effectiveness of instructor feedback for learning-oriented language assessment: Using an integrated reading-to-write task for English for academic purposes. *Assessing Writing, 32*, 57-71.

Kim, J. J. (2020). A Self-compiled specialized corpus as a writing reference tool: a case of Korean graduate students in engineering. *Studies in Foreign Language Education*, *34*(1), 431-457.

Kim, M., & Belcher, D. D. (2018). Building genre knowledge in second language writers during study abroad in higher education. *Journal of English for Academic Purposes*, *35*, 56-69.

Kim, N. (2015). A needs analysis for developing an ESP Program for engineering graduate students and researchers. *Studies in English Education, 20*(2), 297-321.

Kim, N. (2020). A study on the current state of academic English journal writing by

graduate engineering students. *Cross-Cultural Studies*, *59*, 55-80.

Kobayashi, H., & Rinnert, C. (2012). Understanding L2 writing development from a multicompetence perspective: Dynamic repertoires of knowledge and text construction. In R. M. Manchón (Ed.), *L2 writing development: Multiple perspectives* (pp. 101-134). Berlin, Boston: De Gruyter Mouton.

Kuo, C. H. (1999). The use of personal pronouns: Role relationships in scientific journal articles. *English for Specific Purposes, 18*(2), 121-138.

Kuteeva, M. (2013). Graduate learners' approaches to genre-analysis tasks: Variations across and within four disciplines. *English for Specific Purposes*, *32*(2), 84-96.

Kuteeva, M., & Negretti, R. (2016). Graduate students' genre knowledge and perceived disciplinary practices: Creating a research space across disciplines. *English for Specific Purposes*, *41*, 36-49.

Kwan, B.S.C. (2010). An investigation of instruction in research publishing offered in doctoral programs: the Hong Kong case. *High Education, 59,* 55-68.

LeCompte, M. D., & Schensul, J. J. (2013). *Analyzing & interpreting ethnographic data: A mixed methods approach* (2nd ed.). Lanham, MD: AltaMiraPress.

Lee, D., & Swales, J. (2006). A corpus-based EAP course for NNS doctoral students: Moving from available specialized corpora to self-compiled corpora. *English for Specific Purposes, 25*(1), 56-75.

Leki, I. (1995). Good writing: I know it when I see it. In D. Belcher & G. Braine (Eds.), *Academic writing in a second language: Essays on research and pedagogy* (pp. 23-46). Norwood, NJ: Ablex.

Li, Y.-Y. (2006a). A doctoral student of physics writing for publication: A sociopolitically-oriented case study. *English for Specific Purposes*, *25*(4), 456-478.

Li, Y.-Y. (2006b). Negotiating knowledge contribution to multiple discourse communities: A doctoral student of computer science writing for publication. *Journal of Second Language Writing, 15*(3), 159-178.

Li, Y. Y. (2007). Apprentice scholarly writing in a community of practice: an intraview of an NNES graduate student writing a research article. *TESOL Quarterly, 41*(1), 55-79

Li, Y.-Y., & Flowerdew, J. (2007). Shaping Chinese novice scientists' manuscripts for publication. *Journal of Second Language Writing, 16*(2), 100-117.

Lim, H. (2018). *STEM doctoral students' research stress: Causes and coping mechanism. A case based on Seoul National University* [Doctoral dissertation]. Seoul National University.

Luke, A. (1997). Theory and practice in critical discourse analysis. *International Encyclopedia of the Sociology of Education, 8*, 50-57.

Miller, C. R. (1984). Genre as social action. *Quarterly Journal of Speech, 70*(2),

151-167.

Min, J. Y. (2017). *A case study of Korean adult EFL writers' computer-assisted L2 writing focusing on the use of online resources as L2 writing aids* [Unpublished doctoral dissertation]. Seoul National University.

Mitchell, S., & Andrews, R. (1994). Learning to operate successfully in advanced level history. In A. Freedman, & P. Medway (Eds.), *Learning and teaching genre* (pp. 81-103). NH: Boynton, Cook Publishers.

Mansourizadeh, K., & Ahmad, U. K. (2011). Citation practices among non-native expert and novice scientific writers. *Journal of English for Academic Purposes*, *10*(3), 152-161.

Mostafavi, S., Mohseni, A., & Abbasian, G. R. (2021). The pedagogical efficacy of ESP courses for Iranian students of engineering from students' and instructors' perspectives. *Asian-Pacific Journal of Second and Foreign Language Education, 6*(1), 1-20.

Negretti, R. (2012). Metacognition in student academic writing: A longitudinal study of metacognitive awareness and its relation to task perception, self-regulation, and evaluation of performance. *Written Communication*, *29*(2), 142-179.

Negretti, R. (2017). Calibrating genre: Metacognitive judgments and rhetorical effectiveness in academic writing by L2 graduate students. *Applied Linguistics*, *38*(4), 512-539.

Negretti, R., & Kuteeva, M. (2011). Fostering metacognitive genre awareness in L2 academic reading and writing: A case study of pre-service English teachers. *Journal of Second Language Writing*, *20*(2), 95-110.

Ozturk, I. (2007). The textual organisation of research article introductions in applied linguistics: Variability within a single discipline. *English for Specific Purposes, 26*(1), 25-38.

Paltridge, B. (2001). *Genre and the language learning classroom*. University of Michigan Press.

Paltridge, B., & Phakiti, A. (Eds.). (2015). *Research methods in applied linguistics: A practical resource*. Bloomsbury Publishing.

Park, C. (2007). *Effects of genre-based writing instruction on Korean high school students' writing development in English* [Unpublished master's thesis]. Seoul National University.

Pennycook, A. (1997). Vulgar pragmatism, critical pragmatism, and EAP. *English for Specific Purposes, 16*(4), 253-269.

Polio, C., & Friedman, D. (2016). *Understanding, evaluating, and conducting second language writing research*. Routledge.

Posteguillo, S. (1999). the schematic structure of computer science research articles. *English for Specific Purposes, 18*(2), 139-160.

Rothery, J. (1994). *Exploring literacy in school English (Write it right resources for literacy and learning)*. Metropolitan East Disadvantaged Schools Program.

Russell, D. R., Lea, M., Parker, J., Street, B. Donahue, T. (2009). Exploring notions of genre in "Academic Literacies" and "Writing Across the Curriculum": Approaches across countries and contexts. In C. Bazerman, A. Bonini, & D. Figueiredo (Eds.), *Genre in a changing world* (pp. 395-423). West Lafayette, IN: Parlor Press.

Saldaña, J. (2015). *The coding manual for qualitative researchers*. Sage.

Samraj, B. (2002). Introductions in research articles: variations across disciplines. *English for Specific Purposes*, *21*(1), 1-17.

Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary educational psychology, 19*(4), 460-475.

Shin, I. (2015). English communicative needs of academic situations in Korea. *Studies in English Education*, *20*(4), 1-31.

Sommer-Farias, B. (2020). *"This is helping me with writing in all languages": Developing genre knowledge across languages in a foreign language course* (Publication No. 27996128) [Doctoral dissertation, The University of Arizona]. ProQuest Dissertations Publishing.

St. John, M. J. (1996). Business is booming: Business English in the 1990s. *English for Specific Purposes, 15*(1), 3-18.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. CA: Sage.

Swales, J. M. (1981). *Aspects of article introductions.* Aston ESP Research Reports (No. 1). University of Aston.

Swales, J. M. (1990). *Genre analysis: English in academic and research settings*. Cambridge University Press.

Swales, J. M. (2004). *Research genres: Explorations and applications*. Cambridge University Press.

Swales, J. M. (2019). The futures of EAP genre studies: A personal viewpoint. *Journal of English for Academic Purposes*, *38*, 75-82.

Swales, J. M. & Feak, C. B. (2000). *English in today's research world: A writing guide.* Ann Arbor, MI: University of Michigan Press.

Swales, J. M., & Feak, C. B. (1994). *Academic writing for graduate students: A course for nonnative speakers of English. Commentary*. University of Michigan Press.

Swales, J. M., & Feak, C. B. (2004). *Academic writing for graduate students: Essential tasks and skills* (2nd ed.). University of Michigan Press.

Swales, J. M., & Feak, C. B. (2012). *Academic writing for graduate students: Essential tasks and skills* (3rd ed.). University of Michigan Press.

Swales, J. M., & Lindemann, S. (2002). Teaching the literature review to international graduate students. In A. M. Johns (Ed.), *Genre in the classroom: Multiple perspectives* (pp. 105-119). Mahwah, NJ: Lawrence Erlbaum.

Tardy, C. (2004). The role of English in scientific communication: Lingua franca or tyrannosaurus rex? *Journal of English for Academic Purposes, 3*(3), 247-269.

Tardy, C. (2005). It's like a story: rhetorical knowledge development in advanced academic literacy. *Journal of English for Academic Purposes, 4*, 325-338.

Tardy, C. M. (2006). Researching first and second language genre learning: A comparative review and a look ahead. *Journal of Second Language Writing, 15*(2), 79-101.

Tardy, C. M. (2009). *Building genre knowledge*. Parlor Press LLC.

Tardy, C. M. (2011). The history and future of genre in second language writing. *Journal of Second Language Writing*, *20*(1), 1–5.

Tardy, C. M. (2012). A rhetorical genre theory perspective on L2 writing development. In R. M. Manchón (Ed.), *L2 writing development: Multiple perspectives* (pp. 165-190). Berlin, Boston: De Gruyter Mouton.

Tardy, C. M. (2016). *Beyond convention: Genre innovation in academic writing.* University of Michigan Press ELT.

Tardy, C. M., Sommer-Farias, B., & Gevers, J. (2020). Teaching and Researching Genre Knowledge: Toward an Enhanced Theoretical Framework. *Written*

Communication, *37*(3), 287-321.

Tarone, E., Dwyer, S., Gillette, S., & Icke, V. (1981). On the use of the passive and active voice in astrophysics journal papers: With extensions to other languages and other fields. *English for specific purposes, 17*(1), 113-132.

Thompson, G., & Yiyun, Y. (1991). Evaluation in the reporting verbs used in academic papers. *Applied linguistics, 12*(4), 365-382.

Thompson, P., & Tribble, C. (2001). Looking at citations: Using corpora in English for academic purposes. *Language Learning and Technology, 5*(3), 91–105.

Vygotsky, L. S. (1978). *Mind and society: The development of higher psychological processes*. Harvard University Press.

Winsor, D. A. (1996). *Writing like an engineer: A rhetorical education*. Routledge.

Yasuda, S. (2011). Genre-based tasks in foreign language writing: Developing writers' genre awareness, linguistic knowledge, and writing competence. *Journal of Second Language Writing*, *20*(2), 111-133.

Yayli, D. (2012). Tracing the benefits of self annotation in genre-based writing. *The Journal of Language Learning and Teaching*, *2*(1), 45-58.

Yoon, H., & Hirvela, A. (2004). ESL student attitudes toward corpus use in L2 writing. *Journal of second language writing, 13*(4), 257-283.

국문 초록

본 연구는 한국 공대 대학원생들의 영어 학술 논문 장르 지식을 구축하는 과정에 대한 탐구를 목표로 한다. 학술논문(Research Articles)은 논문을 출판하지 못하면 소멸하는 경쟁적인 학계의 문화 속에서 높은 관심을 받는 장르로서 점점 더 중요성을 얻고 있다. 영향력이 큰 국제 학술지에 논문을 게재하는 것은 그 어떤 연구자에게도 벅찬 작업이지만, 영어 학술 논문 게재의 압박은 영어를 외국어로 사용하는 초보 연구자들에게 배가될 수 밖에 없는 것이 사실이다. 이러한 초보 연구자의 입장에서 영어 학술 논문을 작성한다는 것은 고급 학술 영어 작문 능력 뿐만 아니라 연구자가 속한 담화 공동체(discourse community)에 특화된 규범에 맞는 글을 작성하는 것이 요구되기 때문에 이중 부담을 짊어지게 된다.

이러한 학습자들의 요구를 충족시키기 위해, 장르 기반 교수법(genre-based instruction)은 학습자들이 학업 및 직업에 필요한 목표 장르의 언어적, 구조적인 특징을 신속하게 배울 수 있도록 돕는 효과적인 교수법으로서, 특히 특수 목적 영어(English for Specific Purposes, ESP) 분야에서 오랫동안 관심을 가져왔다. 최근 ESP의 장르 교수 및 학습에 관한 연구는 언어적 지식과 더불어 학습자의 장르 인식 개발의 중요성을 강조하고 있으며, 주요 학습활동으로 장르 분석(genre analysis)을 내세우고 있다.

현재까지 대부분의 ESP 장르 교수법 연구는 학습자의 학습과정보다는 교수법 효과를 중심으로 대부분 수행되어 왔고, 학습자의 장르 분석에 대한 연구로는 영어를 제 2 외국어로 사용하는 학습자, 특히 인문 사회 과학 계열의 고급 영어 학습자들 중심으로 이루어졌다. 이들은 종종 고급 언어 분석 기술을

요하는 장르 분석 과제를 수행하기에 더 나은 위치에 있는 점으로 미루어 보아, 다른 배경의 학습자들을 대상으로 했을 때 장르 분석이 학습활동의 도구로 적합한지에 대한 연구가 요구된다. 제 2 언어 영어 학습자의 장르 분석 활동을 통한 장르 학습에 대한 기존 연구들은 대부분 소수의 학습자를 대상으로 한 사례 연구로 제한되어, 주어진 장르 교수법에 대한 다양한 학습자들의 포괄적인 관점이나 그들의 작문에 나타난 장르적 특성에 대한 연구가 부족한 실정이다.

본 연구는 장르 교수 및 학습 분야에서 연구가 충분히 되어 있지 않은 배경의 학습자들을 대상으로 장르 분석의 학습활동으로서의 적합성을 탐구하기 위한 시도로 설계되어, 한국에서 영어를 외국어로 학습하는 공대 대학원생들의 장르 지식 개발 과정을 탐구하고 시행된 장르 교수법에 대한 학생들의 인식을 조명한다. 본 연구는 장르 교수법을 기반으로 15주간 36명의 공대 대학원생들을 대상으로 한 논문 작성법 수업에서 논문 구조의 이동마디(moves)에 대한 명시적인 교수를 바탕으로 학습자들은 본인이 직접 선정한 모델 논문 분석, 개인적으로 분석한 내용을 공유하는 조별 토론, 본인이 작성한 학술 논문 초안에 직접 주석 작성하는 활동과 강사 피드백 등 다양한 장르 학습 활동에 참여했다. 이 과정에서 학생들은 중간, 기말 면담과 기말 설문지를 통해 장르 기반 교수법을 통해 학술 논문 장르를 학습한 경험을 공유했다. 기존 사례 연구의 한계에서 벗어나기 위해 수집된 자료는 정성적 혼합 방법(qualitative mixed methods)으로 분석되었다. 설문지 리커트 척도 문항은 기술 통계와 일원 반복 측정 분산 분석하였고, 설문조사의 개방형 응답, 참여자 인터뷰 및 학습 활동 결과로 얻은 정성적 자료는 공통 주제가 나타날 때까지 지속적인 비교 분석 방법(constant-comparative methods)으로

분석하였다.

참여자들이 학습 활동으로 생성한 물적 자료와 면담 및 설문지 자료를 삼각측량한 결과, 일부 학생들의 장르 지식이 다수의 영역에서 통합되는 발전된 모습을 보인 반면, 모든 학생들이 인지한 장르 지식을 성공적으로 작문에 반영하지는 못했다. 가장 두드러지게 나타난 주제는 형식적 지식과 수사학적 지식 영역의 통합이었고, 특히 학생들의 모델 논문 분석 과제와 본인의 주석을 단 작문 과제에서 이동마디의 수사학적인 기능과 세부분야에 따라 변화되는 이동마디 구조 및 어휘 문법 기능에 대한 분석이 가장 많이 나타났다.

본 장르 교수법에서 가장 호평을 받은 수업 구성요소는 학습자들이 본인의 주석을 단 작문 과제와 강사 피드백으로 나타났으며, 반대로 주요 장르 분석 과제로 설계된 모델 논문 분석과 조별 토론 활동은 참여하는데에는 상대적으로 어려움을 보였다. 대체로 참여자들은 학술 논문에서 요구되는 이동마디 구조 및 어휘문법에 대한 이해와 응용력의 향상을 장르 분석 활동보다는 본인의 주석을 단 작문 활동과 강사 피드백에 기인했고, 참여자들이 스스로 인식한 향상된 점은 전체 학생 작문의 대략 3분의 1에서 나타났다. 학생 작문의 정성적 분석 결과, 제공된 강사 피드백을 모두 확인하고 본인의 주석 및 작문과 모델 논문 분석에 깊이 관여하고, 논문 게재가 임박한 참여자들의 글에서 주로 이동마디의 구조적 변화가 관찰되었으며, 더욱 정확하고 효과적인 인용과 격식체가 사용되는 것으로 나타났다.

전반적으로 학습자들은 자신의 글에 주석을 달고 수정하는 데 있어서 주로 어휘문법적 특징과 같은 형식적인 지식에 특별히 주의를 기울이는 모습을 보였다. 기말 성찰 과제에서 대다수의 학습자들은 어휘문법을 이동마디 구조와

더불어 본 장르 교수법을 통해 가장 많은 발전을 이룬 부분인 동시에 문장 작문 능력과 더불어 향후에 더 많은 발전이 필요한 대상으로 꼽았다.

참여자들의 장르 지식 발전 양상과 장르 교수법에 대한 인식의 접점에서 관찰된 결과를 바탕으로, 본 연구는 형식 및 수사학적 장르 지식 영역의 특성에 대해 고찰하고, 장르적 특성의 인지와 수행 사이의 간극을 메우기 위한 방법으로 장르 학습자의 형식적 장르 지식 개발의 중요성을 논의한다. 마지막으로 본 연구는 영어를 외국어로 학습하는 환경에서 더 많은 언어적 지원이 필요한 학습자들의 즉각적인 학술 작문 요구에 대응하는 실용적이고 국지적인 장르 교수법을 개발할 필요성과 그 교육학적 의미를 논의한다.

주요어: 학술 목적 영어 작문, 장르 지식, 학술 논문, 한국 공대 대학원생, 장르 기반 쓰기 교육, 장르 분석, 혼합 연구방법

학번: 2016-35730