Move Analysis of Science and Engineering PhD Abstracts: Variations between the Two Disciplines in a Thai University

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Abstract

This study aims to investigate the differences of the move structure between science and engineering PhD abstracts produced at Suranaree University of Technology, Thailand. A corpus of 25 abstracts from each of the two disciplines was purposively drawn from Suranaree University of Technology Intellectual Repository (SUTIR) with the university's permission, constituting a final corpus of 50 abstracts for the analysis. The move structure analysis of these abstracts was conducted using Hyland's (2000) five-move framework (Introduction-Purpose-Method-Product-Conclusion). The move frequency classification was based on Kanoksilapatham (2005), and the inter-rater reliability was calculated using percent agreement (Holsti, 1969). The findings reveal that although the writers of these abstracts were from the same local academic discourse community, they create both major and minor differences in their abstract writing, possibly due to the different disciplinary knowledge and culture they subscribe to. Moreover, the engineering

PhD abstracts show greater similarity in function and composition to those presented in the adopted analysis framework than their science counterparts. The researchers hope from this study that the results can also shed more light on the disciplinary discourse variations and can offer pedagogical implications for academic English writing teachers to teach students to write the PhD abstracts in their fields.

Keywords: Genre, PhD Abstracts, PhD Dissertations, EFL Writing

Introduction

The English language has become one of the main channels for distributing an advanced scientific knowledge among scholars world-wide (McKay, 2003; Suksiripakonchai, 2013). There is a large number of non-native English students (NNES) attending universities overseas for a degree which requires writing of a thesis or dissertation in English. There is a great amount of information communicated through English, especially in academic areas, e.g., science and technology textbooks, and journals. Moreover, English has become the accepted international language of technology and commerce (Hutchinson & Waters, 1987). In the last 30 years, there were about 7,000 scientific journal articles being published every day (Naisbett, 1982; Tardy, 2004). With this concern, it is expected that the amount of articles today is unimaginable. In the context of globalization and increasing international research collaborations, the ability to read and/or write research articles in English is crucial for academic and professional success in science and technology (Baldauf & Jernudd, 1983; Gibbs, 1995; Wood, 2001; Kanoksilapatham, 2005). After science and technology students graduate, the jobs they can do are mostly engineers, mechanics, technicians, or particularly in scientific areas. They have to read a lot of English instruction manuals and sometimes they also have to communicate in English at their

workplaces. For higher education especially in the tertiary level, many graduate students have to write their dissertations in English as well. However, it has been found that the students have great difficulties in writing their dissertations (e.g., Bunton, 2002; Paltridge, 2002; Paltridge & Starfield, 2007; Pramoolsook, 2008). In response to this concern, for over two decades there has been an increasing attention to the studies into research genres to facilitate students' writing. The seminal work of Swales (1990) on research articles (RAs) that gives rise to the CARS (Create A Research Space) model for the Introduction sections has inspired many genre analysts to conduct later studies of research genres, especially the move-step structure in RAs. Studies on either specific sections or the whole RAs have received much attention among the genre analysts since then. To date, there have been a few studies on the PhD dissertation move analysis of a single chapter, for example, the Introduction chapters from a range of disciplines (Bunton, 2002); the Conclusions chapters from the same corpus (Bunton, 2005); the Literature Review chapters in Applied Linguistics (Kwan, 2006); the Introduction chapters from Computing written in Spanish and in English (Monreal et al., 2011); and the science PhD abstracts (Saengsai & Pramoolsook, 2015). What is apparent is the scarcity of the comparative studies on PhD dissertation abstracts written by non-native PhD students between science and engineering disciplines. Therefore, this study is conducted to gain a better comprehensive knowledge of the move structures, and the variations of the PhD abstracts written by science and engineering students in Suranaree University of Technology, a Thai University. The objectives of this study translate into these following research questions: (1) What are the Abstract move structures in science and engineering PhD dissertations produced by graduate students in SUT? and (2) What are the similarities and differences of Abstract move structures between science and engineering PhD dissertations produced by graduate students in SUT?

Literature Review

1. PhD Dissertations

PhD dissertation is one of the academic genres that is considered very important. Swales (2004) points out that it is the culminating genre of doctoral education. Moreover, PhD dissertation is also a genre submitted in support for a degree of professional qualification presenting the author's research and findings. As a result, the PhD dissertation should not be like an informal essay or an editorial. It has to be like the writing for scholars, and it has to be created in a special way and follow very specific rules (Glatthorn & Joyner, 2005). The terms of 'thesis', and 'dissertations' are used in different parts of the world. Paltridge (2002) reports that in USA, master's students write 'theses', whereas in Britain, they write 'dissertations'. However, at the PhD level, these two terms are reversed. In Australia, the term 'thesis' is used at both the master's and doctoral levels. In New Zealand, a dissertation is a smaller piece of work whereas a thesis is larger research project written for a master's or doctoral degree. Although the two terms are used interchangeably, the 'dissertation' will be referred to as the PhD dissertation following Swales (2004), which will be used to call the target texts in this present research.

PhD dissertations are not often written only in a certain format specified in the universities' writing regulations. According to a study by the Council of Graduate Schools surveying 50 universities in the U.S. and Canada, the dissertation format is determined by the differences in the nature of research, the structure and expectations of the discipline, and the accepted form for publication in the discipline (Council of Graduate Schools, 1991). Dong (1998) identifies three major formats of dissertation. The first type is Traditional Introduction - Literature review - Methodology - Results - Discussion, while the format of the second type is Article-compilation format which is basically an anthology of individual publishable research papers that contains its own

Introduction, Methodology, Results and Discussion sections. The last type starts with 'Introduction' and ends with a chapter headed 'Conclusion', and chapters in-between are titled according to the topics and sub-topics of the writer's investigation. In addition, Paltridge (2002) finds that there are four main kinds of dissertation: 'Traditional simple, Traditional complex, Topic-based, and Compilations of research articles'. A dissertation with a simple traditional pattern is one which reports on a single study and has a typical macro-structure of 'Introduction', 'Review of the literature', 'Materials and methods', 'Results', 'Discussion', and 'Conclusion'. A dissertation with a complex structure is the one which reports on more than one study. It typically has 'Introduction' and 'Review of the literature' sections but it might have a 'General methods' section, which is followed by a series of sections which reports on each of the individual studies. Then, it ends with a general overall Conclusion section. A Topic-based dissertation typically begins with an Introduction chapter, which is then followed by a series of chapters that have titles based on sub-topics of the topic under investigation. The dissertation then ends with a Conclusion chapter. The last type of dissertation is based on a compilation of published research articles, which is different from the other sorts of dissertations. This type of dissertation is written as experts writing for experts rather than novices writing for admission to the academy (Dong, 1998; Dudley-Evans, 1999; Thompson, 1999; Paltridge, 2002). In Paltridge's study (2002), he reports that the Traditional simple type is more common at the Master's level than at the doctoral level where students carry out more Traditional complex types of study. The different dissertation types reported in the literature possibly indicate that PhD dissertations can have varied formats and the variations of its structure within specific disciplines have been observed.

One of the certain parts which also appears in all the four types of dissertation in Paltridge (2002) is the Abstract. It can be said that this textual

element is a PhD synopsis following Bhatia's (1993) idea in that the Abstract is a brief conclusion of a research article. Consequently, writing abstracts is a crucial rhetorical skill required for all the PhD students in SUT. It is beneficial for the students to know how to present the research summary appropriately and effectively in the PhD dissertations in their disciplines.

2. The Abstract

An abstract is a description or factual summary of the much longer report, and it is meant to give the reader the exact and concise knowledge of the full article (Bhatia, 1993). Moreover, the abstract is one of the first sections that readers might want to read. After the title or the research topic, the abstract generally is the readers' first encounter with a text, and often the point at which they decide whether to continue reading or to ignore it. In other words, readers will determine the value of research by reading abstracts, and the decision to judge whether the research papers are worth reading or not is often made by readers through reading the abstracts (Hyland, 2000). Therefore, a well-written abstract will promote the text attached to it more effectively (Ren & Li, 2011).

A move is a segment of text that is shaped and constrained by a particular communicative function (Holmes, 1995). It is a text segment made up of a bundle of linguistic features, signaling the content of discourse in it (Nwogu, 1997).The starting point on move analysis of abstracts is found in the studies of Swales (1990) and Bhatia (1993), and the focus is on RA abstracts from linguistic journals. Since then, there have been a few studies relating to published RA abstracts move analyses (e.g., Hyland, 2000; Lorés, 2004). Although move analysis on dissertation abstracts is not quite well-known when compared to RA abstracts, this particular genre should not be disregarded to study because one of the first elements that the dissertation examiners have to read is Abstract (Ren & Li, 2011). In order to

draw impressions from dissertation readers, e.g., PhD examiners, a well-written abstract has to be created.

For better understanding of the communicative purposes of RA abstracts, Bhatia (1993) notes that they present a faithful and accurate summary, which is a representative of the whole article. His notion corresponds to the definition given by The American National Standards Institute (ANSI), that is, "An abstract is an abbreviated, accurate representation of the contents of a document, preferably prepared by its author(s) for publication with it" (ANSI, 1979). For the RA abstract framework, Bhatia (1993) proposes a four-move structure which contains information relating to 1) what the author did, 2) how the author did it, 3) what the author found, and 4) what the author concluded in a typical abstract. Table 1 below summarizes the details of Bhatia's four-move structure of RA abstracts.

Table 1: RA Abstract Framework (Bhatia, 1993, pp. 78-79)

Move	Function
Introducing purpose	*Outlining objectives or goals of the experiment. This move gives a precise indication of the author's intention, thesis or hypothesis which forms the basis of the research being reported.*
Describing methodology	*Providing a good indication of the experiment design, including information on data, procedures and methods. The author gives a good indication of the experimental design, including information on the data, procedures or method(s) in this move.*
Summarizing results	*Offering observations and findings, and suggesting solutions to the problem. This is an important aspect of abstracts where the author mentions his observations and findings.*
Presenting conclusions	*Interpreting results and drawing conclusion. This move is meant to interpret results and draw inferences. It typically includes some indication of the implication and applications of the present findings.*

For more details about the RA abstract communicative purposes, Hyland (2000) analyzes the abstract corpus from 8 disciplines of philosophy, social science, applied linguistics, marketing, electrical engineer, magnetics, physics, and biology. His study does not suggest the definitive description of move structure or features of RAs abstracts, but he offers an account of abstract writing that reflects writers negotiating in the significance of their research internationally. Therefore, the awareness of persuasive communicative purposes of abstracts is reflected in writers' actual writing practices. Moreover, Hyland (2000) summarizes that the abstract is generally readers' first encounter with a text. Unlike the previous analyses of abstracts (e.g., Bhatia, 1993; Brenton, 1996) that have identified a move-step structure, corresponding to the organization of the paper itself: Introduction-Methods-Results-Conclusion, he separates the writer's purpose from the introduction because it seems to represent a very different role to the introduction's typical purpose. Table 2 below is Hyland's move classification of RA abstracts.

Move	Function
Introduction (I)	*Establishes context of the paper and motivates the research or discussion.*
Purpose (P)	*Indicates purpose, thesis or hypothesis, outlines the intention behind the paper.*
Method (M)	*Provides information on design, procedures, assumptions, approach, data, etc.*
Product (Pr)	*States main findings or results, the argument, or what was accomplished.*
Conclusion (C)	*Interprets or extends results beyond scope of paper, draws inferences, points to applications or wider implications.*

In sum, move analysis on dissertation abstracts seems to be neglected as seen from a small number of studies on this particular genre (e.g., Pramoolsook, 2008; Ren & Li, 2011; Nguyen, 2014). Also, there is no evidence on the similar study of PhD dissertation abstracts. However, Hyland's (2000) framework should be compatible with the corpus of this study as it covers a wide range of disciplines, including science and engineering disciplines. Moreover, both the studies of Pramoolsook (2008) on science and engineering Master's dissertation abstracts, and Ren & Li (2011) on the abstracts in applied linguistics adopt this framework to analyze the dissertation abstracts in their research. This model provides a clear and precise description for the communicative purposes for each move, and it provides a substantial basis for the analysis of a wide range of academic disciplines, e.g., Biotechnology and Environmental Engineering (Pramoolsook, 2008) and also Applied Linguistics (Ren & Li, 2011). Consequently, Hyland's (2000) model on abstract analysis was selected to identify move structures of the target corpus in this present study.

Methods

1. Selection of PhD Abstracts and Corpus Management

The data consisted of 25 PhD dissertation abstracts from each of the science and engineering disciplines, totaling 50 dissertation abstracts written during the years 1999-2012 by SUT PhD students. These dissertations were purposively obtained by distributing the letters asking for permission to the Deans of Institute of Science and Institute of Engineering, Suranaree University of Technology, Thailand. The general identification criteria of sources from which texts to be collected proposed by Nwogu (1997)-representativeness, reputation, and accessibility is then followed. To create the corpus, the selected abstracts from science and engineering disciplines

were designated as S1 to S25, and E1 to E25, respectively for ease of reference and to ensure anonymity of the dissertation writers.

2. Analysis Process

To start the move identification in the Abstract from the two corpora, the move analysis method was employed to investigate the move structures of science and engineering PhD dissertation abstracts following the four-step procedure suggested by Dudley-Evans (1994) and Holmes (1995). In terms of marking the moves, the researchers looked for organization, where communicative purposes of the writers were considered, then the moves were identified. The researchers used sentence-level analysis as some moves can be realized by one sentence or more or even by the whole paragraph to show only one move. Therefore, a sentence or a group of sentences were classified into the same move until the new move occurred in the next sentence or paragraph. Then, the move classification was validated by the inter-coder analysis that involved three PhD candidates in order to ensure the inter-rater reliability of the findings.

3. Move Frequency Classification

The criteria for move frequency classification of Abstract were based on Kanoksilapatham (2005). For example, if a particular move occurred in all of the 25 Abstracts from each of the two disciplines, which account for 100%, it was considered as 'obligatory'. The move occurrence from 60-99% was regarded as 'conventional', and the move frequency below 60% was considered as 'optional'. However, a move that is not in the Hyland's framework (2000) was not determined as a new move unless it was found with about 50% in the corpus (Nwogu, 1997). Then, a comparison analysis of move structures of PhD dissertation abstracts between science and engineering disciplines was conducted to reveal the disciplinary variations between the two fields.

4. Discourse-Based Interviews

Apart from these product-based analyses, a set of qualitative data were included to enrich the move findings of this study. To gain such data, discourse-based interviews following Hyland (2000) with some representatives from the two target disciplines, who were involved in the process of writing these particular texts, were also employed in this research. Eight informants (4 from each discipline) were purposively approached and asked questions related to interesting analysis findings from the abstracts. For the science discipline, a PhD supervisor, and a student from chemistry, biology, and physics each were designated as SI1, SI2, SI3, and SI4. For the engineering discipline, a PhD supervisor, and a student from electrical, telecommunication, and chemical engineering each were designated as EI1, EI2, EI3, and EI4, respectively.

5. Inter-Rater Reliability

Reliability is the extent to which a measuring procedure yields the same repeated results on repeated trials (Neuendorf, 2002). In this present investigation, the researchers used the simple method of reporting inter-rater reliability, that is, 'Percent agreement' proposed by Holsti (1969). The rationale to choose this method was that the criterion for the agreement between three coders who code the same units is concerned with whether they agreed to the precise samples assigned to a given variable (Neuendorf, 2002). As proposed by Crookes (1986), raters should be individual with some linguistic sophistication. Two PhD students, i.e., the researcher herself and the other one in English Language Studies (ELS) were trained about the move identification using the analysis framework to ensure the reliability and validity of the results. After that, the two raters independently analyzed the 6 samples for 2 weeks. To insure that the rater has expertise in the focused texts from the two disciplines, a PhD candidate in chemistry was invited to

take part in the inter-rating process in order to help confirm the reliability and validity of the analysis results, following Kanoksilapatham (2005). Initial analysis results on the move structures between the two raters were discussed and compared to fine tune the results on the functional and semantic purposes that are being realized by the text segments (Biber et al., 2007).

Results and Discussion

1. Surface Structure of Science and Engineering PhD Abstracts

The results on the surface structure of the Abstract from the two disciplines found that this section is located as the first part of each corpus of the two disciplines. However, the average word count of the science Abstract is approximately two times shorter than the engineering Abstract (i.e., 232 and 447 words). This can probably indicate that the SUT PhD science students require less content to write in their abstracts than the PhD engineering students. Such difference might be due to the different nature of the disciplines that the two groups of writers belong to, which hold specific standards and practices of method choice, reasoning and argument that have evolved with a research tradition of each of the disciplines (Hyland, 2000). Table 3 and Table 4 show the findings on move structures of the PhD Abstract from the two fields, respectively.

Move	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23	S24	S25	Total
Introduction		+	+												+					+						4(16%)
Purpose	+	+	+	+	+	+	+	+	+	+			+		+	+	+	+	+	+	+	+	+	+	+	22(88%)
Method		+	+	+	+	+	+	+	+	+	+	+	+		+			+	+		+	+		+	+	19(76%)
Product	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	24(96%)
Conclusion	+	+	+	+						+	+		+		+	+	+							+	+	12(48%)
Number of Move Types	3	5	5	4	3	3	3	3	3	4	3	2	4	1	5	3	3	3	3	2	3	3	2	4	4	

Table 4: Move Structures of SUT Engineering PhD Abstracts

Move	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14	E15	E16	E17	E18	E19	E20	E21	E22	E23	E24	E25	Total
Introduction	+	+	+		+					+	+		+					+	+					+	+	11(44%)
Purpose	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	25(100%)
Method	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	25(100%)
Product	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	24(96%)
Conclusion	+	+	+	+			+	+	+		+				+				+			+	+			12(48%)
Number of Move Types	5	5	5	4	4	3	4	4	4	3	5	3	3	4	4	3	3	3	5	4	3	3	4	5	4	

2. The Science PhD Abstracts

The abstract analysis from this corpus reveals that the majority of the SUT science abstracts were written with a three-move structure (Purpose-Method-Product), which corresponds to Hyland's (2000), which suggested

that the three-move pattern was the dominant sequence in his corpus (physics students included). He explained that the hard science writers can anticipate that readers will be able to access the writers' understandings to determine the value of the research, the productivity of the procedures, the theoretical rationale of the study, and its significance to the incremental development of knowledge. Therefore, the writers usually open the abstract with a Purpose, then Method, and Product moves, respectively. However, one interesting point of the science abstract move sequence analysis is that the only one abstract in this corpus was written with only the Product move. This insignificant phenomenon was explained by the former science PhD student (SI3) as in the following excerpt.

"…I think the PhD supervisors play a big role in designing the organization of his/her students' abstracts. Because, they know what contents should be placed inside the genre that relate in the study fields. Therefore, having the uncommon abstract patterns is not the students' insufficient knowledge, everything depends on the supervisors' decisions…". (SI3)

It is learnt from the interview that this occurrence is not considered uncommon in the SUT PhD science discourse community. This information, moreover, is similar to the suggestion in Bunton's (2002) in that supervisors are more able than their students to see what types of information should be put into the student's thesis. Hence, writing an abstract with one move is possible in this discipline, however, the decision depends on the thesis supervisor.

3. The Engineering PhD Abstracts

For the analysis of the engineering abstracts, the majority of the SUT engineering abstracts were written with a four-move structure (P-M-Pr-C). The first two moves (P and M) are obligatory. The four-move structure of P-M-Pr-C in the SUT engineering abstract corpus does not follow Hyland's

(2000) five-move framework, however, it seemingly resembles the study of RA medical abstract structure in Salager-Meyer (1992), which suggested that this four-move pattern is one of the well-structured patterns of RA abstracts and the investigation by Bhatia (1993) who proposed a four-move framework for a typical abstract. However, the present study result is the case of PhD abstracts and the finding was explained through the answers from both the former SUT engineering PhD student and the supervisor shown in the following excerpt,

"…Due to the limitation of word counts in our engineering abstracts, which approximately is 2 pages limitation, and we normally have to begin writing the abstract by simplifying the overall studies with purposes of the research. Therefore, having the Introduction even only 2-3 lines inside the abstracts takes up space of the abstract page…" (EI1 & EI4)

According to these informants, the PhD supervisors and students have to know exactly what is contained in the body of the text. In many engineering research studies, writing the general background of the study to begin the Abstract might not always be necessary. This result can possibly point out that the Abstract writing guideline for the engineering students should follow the four-move structure of P-M-Pr-C.

Although the four-move structure of P-M-Pr-C in the SUT engineering corpus seems to correspond with Salager-Meyer (1992) and Bhatia's (1993) findings, it can be pointed out that the engineering abstracts show a greater similarity in function and composition to those presented in Hyland's (2000) framework than their science counterparts.

Most abstracts from the two corpora begin with the Purpose move. This emphasizes the result of Berkenkotter & Huckin's (1995) study in that the writers usually open the abstract with this move. The writers see the importance to establish context of paper; indicate purposes, then provide procedures;

state main finding to promote their research, and indicate implications and applications of the findings (Bhatia, 1993). As pointed out in Hyland (2000), the abstract is a selective rather than exact presentation. Moreover, the researchers from the two disciplines tend to concentrate on the purposes and products of their study as these moves share the same frequency between the two disciplines, 96% for the Product and 88% in science and 100% in engineering for the Purpose. Again, this issue corresponds to Hyland (2000) in that there was a high number of two-move abstracts, where the writers presented their purpose and product only in order to highlight a series of results by presenting them as outcomes of different purposes. Excerpts of these outstanding two moves (Purpose and Product) from the two disciplines are illustrated below.

Purpose... *"The aim of this study was to elucidate the potentially C sequestration of 11 vetiver provenances, Khampheng Phet 1(KP1), Loei (LI), Nakhon Sawan (NS), Prachuamkirikhan (PK), Ratchaburi (RB), Roi Et (RE),......"* ....(S15)

Product... *"It was found that prediction accuracy of analytical hierarchy process (AHP), the frequency ratio (FR) model, and integrated AHP and FR model are 64.90%, 84.82%, and 91.22% respectively. The comparison results showed that the integrated AHP and FR model gave the highest percentage of prediction accuracy in the study area"* ….………..(S4)

Purpose...*"The objective of this research is to experimentally assess the performance of the solar thermal energy storage system using rock fills"*..................(E24)

Product... *"The results showed that plant production efficiency was highest in Run1 (OLR 10kg BOD/ha-d) about 6.55%. In addition, fish production efficiency was highest in Run2 (16kg BOD/ha-d) with abundant energy transfer about 70%."*.................(E8)

While the overall Abstract characteristics from the two disciplines can be sufficiently described by the selected five-move framework by Hyland (2000), they bear slight differences in some missing moves (I and C). However, three abstracts from the science and six from its engineering counterparts contain all the five moves that can support the selected model. Impossibly, this abstract structure is categorized as an optional in both of the disciplines.

According to the results on the majority abstract structure of the two disciplines that differ from the five-move framework of Hyland (2000), this can be suggested that despite the suggestions of some researchers (e.g., Salager-Meyer, 1990; Bhatia, 1993), these writers obviously chose to present their work in ways that do not correspond to the universal 'ideal' of information structuring (Hyland, 2000). Therefore, it indicates that having a different structure from the mentioned framework of the two disciplines is possibly acceptable.

Conclusion

The present research explored the move structures of 50 PhD dissertation abstracts written by PhD students from science and engineering disciplines at Suranaree University of Technology, Thailand. Based on Hyland's (2000) abstract framework and the discourse-based interviews with PhD supervisors and PhD students from the two disciplines, the analysis shows that although the writers of these texts are from the same local academic discourse community, they still reveal major and minor differences in their writing. The possible answers might be because the different disciplinary knowledge and culture they subscribe to. In addition, the engineering PhD abstracts show a greater similarity in function and composition to that presented in the mentioned framework than their science counterparts. The

findings reveal not only the PhD abstract move structures from the two disciplines but also the interesting cases about writing practice of this particular genre. To further create the norm on PhD abstract structure for graduate students in the same local discourse community in order to decently meet the requirement of the framework, it is suggested from the study that formal training in their graduate programs should be considered and offered by the university. This is to make the students aware of the English language knowledge of writing the PhD abstracts. Explicit genre instruction on rhetorical moves helps shape non-native English writers' knowledge of writing scientific papers. This analysis echoes a characteristic way of Abstract organization by the PhD science and engineering students and possible paths that influence the students' writing practice in their university. Even though these research findings can only be generalized to PhD science and engineering students at SUT, to have a clearer picture of how these groups of science and engineering PhD students compose their abstracts, conducting a more inclusive study from universities across Thailand would yield more interesting results.

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