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A Move Analysis of Dissertation Introductions Written by Native English Speakers and Indonesian PhD Students across Disciplines

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Abstract

Dissertation introductions (DIs) have received on-going attention because they are considered to be the most challenging and difficult part of an academic text for graduate students, particularly for non-native English speakers (NNES). However, research that has investigated DIs written by native English speakers (NES) and by NNES, particularly Indonesian (IND) PhD students across various disciplines, is lacking. This paper presents an analysis of moves in the introductory section of 200 dissertations written by NES and IND PhD students in terms of move organization based on Bunton's (2002) adaptation of the CARS framework. The corpus consisted of 200 DIs from the disciplines of physics, linguistics, engineering, and education that were published online on the ProQuest Dissertation and Theses Database. The findings revealed that both NES and IND PhD students followed the moves and steps presented in the framework to create their introduction sections. However, it was also found that only 13 DIs (7%) followed Bunton's CARS in this research, but most of them were not constructed in the way assumed in CARS because a number of move reversals and recursives were found. There were both similarities and differences between NNES and NES writers in the introduction sections with regard to the frequency of move-step occurrences, move-step classifications, patterns, and new steps. Similar findings between the NNES and NES writers appeal for the need to make teachers and L2 learners as well as L1 Ph.D. writers aware of methods for writing precise and concise DIs.

INTRODUCTION

Chapters of dissertations, particularly introduction sections, have received on-going attention from researchers. Writing dissertation chapters is considered to be one of the most difficult parts, if not the most challenging and difficult part, of academic texts for graduate students, especially for students who are non-native English speakers (NNES). According to Bitchener and Basturkmen (2006), it is difficult for NNES students to organize their ideas and to meet

the requirements for writing dissertations. More specifically, Allison et al. (1997) stated that NNES had problems with organization in terms of arranging the elements of a dissertation and constructing arguments. Failure to meet the rhetorical expectations of the research community may result in papers that have been submitted for publication being rejected (Duszak, 1994).

Since Swales' (1990) introduction of a research space (CARS) model to examine the structural organization of introductions in research articles (RAs), interest in research using the CARS model has increased. According to Swales, the introduction to a RA consists of three major moves:

Move 1: Establishing the territory (the author establishes the context for his or her research by offering background information about the topic).
Move 2: Establishing a niche (the author contends that there is a "niche" in present research that needs to be filled through additional study).
Move 3: Occupying the niche. (the author illustrates how he or she will support the counter-claim made, fill the gap identified, respond to the question(s) posed, or carry on the research tradition in order to transform the niche created in Move 2 into the research space that he or she will occupy).

Previous studies have examined the form and function of scientific discourse (Martín-Martín, 2005), the rhetorical structures of academic genres such as lectures, theses, and dissertations (Saeeaw & Tangkiengsirisin, 2014; Suntara & Usaha, 2013), and parts of RAs (e.g., Hirano, 2009; Kanoksilapatham, 2015; Ozturk, 2007). Several studies have investigated the complete organization of theses/dissertations (Dudley-Evans, 1998; Paltridge & Starfield, 2007; Thompson, 2005), while others have discussed specific sections, such as the introduction (Bunton & Tsui, 2002; Nguyen & Pramoolsook, 2014), the literature review (Kwan, 2006), and the conclusion (Bunton, 2005).

Bunton (2002) adopted Swales' (1990) CARS model to analyze 45 introductions to PhD theses produced by native English speakers (NES) and by NNES writers from various disciplines in the fields of science and technology, as well as from the fields of the social sciences and the humanities. Bunton (2002) found that thesis introductions essentially consisted of the three moves in the CARS model, although they also contained a number of steps that were not described in the model, such as "defining terms" in Move 1, "indicating a problem or need" in Move 2, and "thesis structure" in Move 3. In addition, Bunton stated that the majority of the introductions followed the two-part structure assumed in the CARS model (recycling of Move 1/Move 2 followed by Move 3).

Based on Swales' (1990) CARS model, Bunton (1999) compared the introductions in humanities and social science PhD theses to those in science and technology theses. The study revealed that the authors of the humanities and social science introductions used more varieties of Move 3 steps to elaborate on their studies in a more detailed manner. More recent studies, such as those by Soler-Monreal et al. (2011), have also reported cases suggesting disciplinary variations in the structure of the introductions of PhD theses. Soler-Monreal et al. drew on Bunton's (2002) move-step model to analyze introductions in PhD theses by writers in the

discipline of computer science. The authors found that introductions in the field of computer science essentially consisted of the moves and steps described in Bunton's model. However, most were found to employ the tripartite structure of the CARS model (Move 1-Move 2-Move 3), unlike the introductions that Bunton (2002) analyzed. Ono (2017) attempted to use Bunton's (2002) model and Swales and Feak's (2012) CARS model to analyze how steps could be sequenced in introductions in PhD theses in English literary studies. According to Ono (2017), the introductions in the field of literature contained so many step-related features that were so discordant with these models that he practically needed to design a new framework for the analysis. He also demonstrated that, due to the complexity of the step sequencing in the introductions in the field of literature, the overall structure was no longer comparable to the two- or three-part structure of the CARS model. These studies shed some light on the move structures in dissertation/thesis introductions; however, they were compared across the two disciplines of soft science and pure science. According to Biglan (1973), research disciplines should be divided into four knowledge domains based on the nature of the subject matter of the research, namely hard-pure (HP), soft-pure (SP), hard-applied (HA), and soft-applied (SA). A more detailed division of academic areas will allow for clearer comparisons of move organizations.

Previous studies have also examined the differences in move organization using the CARS model across various languages, including Arabic (Alotaibi, 2013), Korean (Lee, 2001), Chinese (Taylor & Chen, 1991), Hindi (Kachru, 1983), Thai (Jogthong, 2001), Indonesian (Mirahayuni, 2002), Spanish (Soler-Monreal et al. , 2011), Hungarian (Árvay & Tankó, 2004), and Japanese (Hinds, 1983; Hirose & Sasaki, 1994; Kobayashi, 1984; Muller, 2017). These studies claimed that languages had their own characteristic rhetorical organization of expository and argumentative prose. For example, Taylor and Chen (1991) compared the move structure in scientific research papers written in English by NES and by Chinese second language (L2) English speakers. The authors pointed out that Chinese writers tended to allocate less space to the critique of previous studies, which is related to Move 2 in the CARS model, and suggested that the omission of Move 2 was a specific feature of Asian culture, as Asian writers tend to avoid passing direct judgment on the work of others. This finding was echoed in Lee's (2001) study; Lee analyzed RAs written by Korean scholars, and found that the RAs included different and unclassifiable types of moves, such as the presence of current educational situations, and proposed a CARS+3 model. It was found that Korean writers preferred the unfolding Situation-Problem-Solution-Conclusion method to the simpler Problem-Solution-Conclusion version, thus implying that Korean writers preferred criticizing educational situations to criticizing studies conducted by other researchers.

When conducting research on writing, researchers not only examine the text, but also the "discursive and social practices" surrounding the text (Connor, 2008). Furthermore, Connor stated that cultural features were embedded in writing and could not be isolated. Connor's (2008) view of CR provides a valuable insight for the present study in that it provides an understanding of the complexity of interacting cultures in an educational setting. As can be seen, although previous studies have compared the differences in DIs between native speakers (NS) and NNS writers from different countries, very few studies have been conducted in Indonesia. Based on the review of previous studies, only one study (Mirahayuni, 2002) was

found to have examined moves in introductions, but it analyzed introductions in RAs and not in dissertations, which would appear to be an under-researched context.

Therefore, the main purposes of the present study were to analyze the move organization in DIs written by Indonesian (IND) and NES PhD student writers, and to compare the DIs written by the two groups across four knowledge domains (HP, SP, HA, and SA). The findings of this study are expected to extend the knowledge of the move structures used by NNS PhD students, as well as the differences between NS and NNS PhD students in the writing of DIs across disciplines.

LITERATURE REVIEW

CARS model

The CARS model was proposed by Swales (1981). Based on his analysis of introductions to RAs across the three different areas of biology/medicine, natural sciences, and social sciences, Swales proposed that a research introduction included four constant rhetorical moves:

Move 1: Establishing the field.
Move 2: Summarizing the previous research.
Move 3: Preparing for the present research.
Move 4: Introducing the present research.

The CARS model has undergone many modifications, both by Swales (1990, 2004) himself and by other scholars (e.g., Anthony, 1999; Árvay & Tankó, 2004; Bunton, 2002; Samraj, 2002) in order to make it suitable for describing introductions to RAs in other disciplines.

With regard to introductions to PhD dissertations, Bunton (2002) proposed a model for thesis introductions/DIs written in English based on the CARS model. As this is the only model to describe thesis introductions that is available, the present author adopted it as the starting point for the analysis in the current study. Bunton analyzed a multidisciplinary corpus consisting of 45 theses, and proposed ten new steps. These new steps revealed the amount of information and the aspects that students who were writing doctoral theses included (or were advised to include) in order to explain the research perspective adopted in the study, the purpose of their work, their positioning, and the organization of the text. These new steps were:

Defining terms in Move 1;

Indicating a problem or need in Move 2; and

Method, Materials or subjects, Product of research/Model proposed, Chapter structure, Research questions/Hypotheses, Theoretical position, Application of the product, and Evaluation of the product in Move 3 (see Table 2.4).

Swales (2004) provided a more general comment about PhD DIs, as he contrasted them to introductions in RAs. Swales argued that DIs had an overall structure that was broadly comparable to that of RAs; he pointed out that longer examples of writing in particular included a greater number of steps and a considerable amount of recycling of moves, but he did not propose a model for DIs that would incorporate Bunton's new steps.

Table 1

Bunton's (2002) modified CARS model

Move 1 (M1): Establishing a territory	
STEPS	[Parameters of the research]
S1: Claiming centrality (importance of the topic)	
S2: Making topic generalizations and providing background information	
S3: **Defining terms*	
S4: Reviewing previous research	
Move 2 (M2): Establishing a niche	
STEPS	[Counter-claiming]
S1A: Indicating a gap in the research	
S1B: *Indicating a problem or need*	
S1C: Question raising	
S1D: Continuing/Extending a tradition	
Move 3 (M3): Occupying the niche (Announcing the present research)	
STEPS	[Chapter structure] [Research questions/ Hypotheses] [Theoretical Positioning] *Defining terms [Parameters of research] [Application of product] [Evaluation of product]
S1: Purposes, aims or objectives	
S2: Work carried out/Announcing the research	
S4: *Method*	
S5: *Materials/Subjects*	
S6: Findings/Results (Announcing/predicting the principal findings) *Product of research/ Model proposed*	
S7: *Justification/Significance*	
S8: *Thesis structure*	

Note: Newly identified steps are in italics.

*Indicates a new step proposed by Bunton that can appear in first or third moves.

[ ] Indicates a step that is occasionally present, according to Bunton.

METHODOLOGY

The present study examined DIs written by NES and IND writers across various disciplines. Two subcorpora of DIs, one consisting of work by NES PhD students and the other consisting of work by IND PhD students, were complied. The source texts were 200 English DIs that were available on the ProQuest Dissertation and Theses Database, which is an open access source published between 2000 and 2019. Previous studies (e.g., Buton, 1999, 2002; Arulandu, 2006; Kawase, 2018) used about 20 DI introductions in their studies; therefore, 200 Dis were considered sufficient and appropriate to answer the research questions. The DIs were selected from four domains of knowledge: HP, SP, HA, and SA (Biglan, 1973). In each domain of knowledge, 25 DIs were written by NES students and the other 25 were written by IND students. When constructing the NES corpus, the NES writers were identified based on their first names and last names, institutions, and acknowledgments. When the identity of an NES writer was not apparent based on the available information, Google searches of their name and affiliations were conducted. Only DIs written by people with clear NES identities were included in the NES corpus. One academic field was selected randomly to represent each domain of knowledge: Physics was selected to represent HP, linguistics to represent SP, engineering to represent HA, and education to represent SA. Twenty-five DIs were then selected randomly from each discipline. See Table 1 for the descriptions of the two corpora.

Table 2

Descriptions of the NES DI corpus and the IND DI corpus

No	Disciplinary groupings	NES DI corpus			INDDI corpus		
		Code of DIs	No. of DIs	No. of words	Code	No. of DIs	No. of words
1.	HP- Physics	NHP	25	47652	IHP	25	59213
2.	SP - Linguistics	NSP	25	81124	ISP	25	126663
3.	HA - Engineering	NHA	25	47579	IHA	25	43021
4.	SA - Education	NSA	25	60225	ISA	25	78067
TOTAL			100	230406		100	306964

Note: *N = Native and I = Indonesian

Research instruments

This research focused on examining the rhetorical structures in DIs in various disciplines to identify the moves and steps. A coding scheme, which was adapted from Bunton's (2002) model, was developed to analyze the data. Bunton's model was selected because it is a complete framework used to analyze moves in introductions in previous studies (e.g. Nguyen & Pramoolsook, 2014; Soler-Monreal et al., 2011). See Table 2 for the coding scheme of the move organization used in this study. Please note that the coding in this study adopted an open approach whereby new moves and steps could be added when found.

Table 3

Codes for move organization in this study (adapted from Bunton's 2002 model)

CODING	MOVES and STEPS
M1	**M 1: Establishing the territory (the situation)**
M1S1	Step 1: Claiming centrality/importance
M1S2	Step 2: Making topic generalizations
M1S3	Step 3: **Defining terms*
M1S4	Step 4: Reviewing items in previous research
M2	**Move 2: *Establishing a niche* (the problem)**
M2S1A	Step 1A: Indicating a gap
M2S1B	Step 1B: **Indicating a problem/need*
M2S1C	Step 1C: Question raising
M2S1D	Step 1D: Continuing a tradition
M3	**Move 3: *Occupying the niche* [the solution]**
M3S1	Step 1: Purposes, aims, or objectives
M3S2	Step 2: Announcing research
M3S3	Step 3: *Method*
M3S4	Step 4: *Materials/Subject*
M3S5	Step 5: Findings/Results
M3S6	Step 6: *Product of research/Model proposed*
M3S7	Step 7: Justification/Significance
M3S8	Step 8: Thesis/Dissertation structure

Data collection and data analysis

All two hundred DI files were coded carefully using the coding scheme developed for moves and steps. Moves can vary in length, and can be identified sentence by sentence or in short phrases or clauses (Al-Ali, 2002; Bhatia, 1993; Henry & Roseberry, 2001; Swales, 1990). Once a specific barrier in the introductions was identified as a move, it was annotated using a code; for example, M1 was used for "Establishing a territory", M1S1 for "Claiming Centrality/ Importance", M2 for "Establishing a niche", M3S1 for "Purposes, aims, or objectives", and so on. After all the moves were identified, the occurrences of the moves and steps and the move organizations were analyzed, and were presented as frequencies, percentages, means, and standard deviations. Once all the moves and steps had been identified and counted, the moves and steps found in the DIs written by NNS and NS were compared to identify similar and different patterns between the two groups of writers.

To check for inter-coder reliability, 60 DIs (30%) in the source texts were selected randomly and were coded by two coders. The first coder was the first author of the present study, and the second coder was an Indonesian university teacher with a master's degree in English education who had experience of conducting research in this area. The second coder was extensively trained to use the coding scheme effectively. During the training session, the two coders coded five DIs together, and verified points when discrepancies in the coding occurred via discussions. Following the training, the two coders coded the 60 DIs separately. Based on Pearson's correlation, the agreement between the two coders was strong at 0.81 (Mackey & Gass, 2016).

RESULTS

The NES PhD students wrote about 230406 words (*Mean* = 9216.24, *SD* = 2681.15) in total, while the IND PhD students wrote about 306964 words (*Mean* = 12278.56, *SD* = 3368.09) (see Table 1). The disciplinary groups of the NES whose introductions were the longest and the shortest were SP (*Mean* = 3244.96, *SD* = 1463.82) and HA (*Mean* = 1903.16, *SD* = 843.04). In the IND DIs corpus, the longest and shortest introductions were SP (*Mean* = 5066.52, *SD* = 2414.69) and HA (*Mean* = 1720.84, *SD* = 687.88). Individually, the longest and shortest of all the NES introductions were found in SP (NSP 24 = 7094 words) and HP (NHP 5 = 410 words), while the longest and shortest IND DIs were found in SP (ISP 18 = 10095 words) and HA (IHA 22 = 407 words).

Occurrences of DI moves produced by NES and IND PhD students

The results for the frequency of DI moves used by the NES and IND PhD students showed that both groups used all three moves; that is, Move 1: "Establishing the territory", Move2: "Establishing a niche", and Move 3: "Occupying the niche" (see Table 3). It is interesting to note that the order of the move frequency was identical: Move 3, Move 1, and Move 2. As can be seen in Table 2, the highest frequency was for Move 3 (354 occurrences in the NES DI corpus and 386 occurrences in the IND DI corpus), followed by Move 1 (343 occurrences in the NES DI corpus and 384 occurrences in the IND DI corpus), and Move 2 (194 occurrences in the NES DI corpus and 240 occurrences in the IND DI corpus). Moreover, the same frequency pattern of Move 3, Move 1, and Move 2 was found in all four knowledge domains and in both groups of PhD student writers, except in the SA discipline for both groups. In this case, the frequency pattern of Move 1, Move 3, and Move 2 was found and in the HA discipline, in which Move 1 and Move 3 occurred equally frequently. It was also found that the SP discipline had the highest frequency in Move 3 in the DIs written by both NES and IND PhD students across all four of the disciplines (NES = 55, IND = 73). Of note, IND PhD student writers were found to use more moves (1010 occurrences) than did the NES writers (891 occurrences). In the NES corpus, it was found that HP produced more moves (238 occurrences) and SA accounted for the least moves (205 occurrences); in the IND corpus, the highest frequency of use of moves was found in SP (312 occurrences) and the lowest frequency was in HA (208 occurrences). In summary, the two groups of writers were found to have more similarities than they did differences in the frequency of the DI moves that they used.

Table 4

The number of occurrences of moves in the DIs written by NES and IND PhD students

Move	NES				All	IND				All
	HP	SP	HA	SA		HP	SP	HA	SA	
Move 1 (Establishing the territory)	86	77	86	94	343	91	114	80	99	384
Move 2 (Establishing a niche)	48	55	43	48	194	55	73	48	64	240
Move 3 (Occupying the niche)	104	97	90	63	354	102	125	80	79	386
Total	238	229	219	205	891	248	312	208	242	1010

Note: HP = Hard-pure, SP = Soft-pure, HA = Hard-applied, and SA = Soft-applied

Move arrangements produced by NES and IND PhD students

The results for the move organizations produced by the NES and the IND PhD student writers showed that the DIs written by the two groups of PhD writers shared more similarities than they did differences. Less than 10% of the members of each group adopted the M1 + M2 + M3 pattern (8% in the NES group and 5% in the IND group); see Table 4.

Table 5

DI pattern M1 + M2 + M3

No.	DI	Move arrangement (M1 + M2 + M3)
1.	NHP 17	M1S1 – M1S2 – M1S4 – M1S3 – M1S4 – M2S1A – M2S1B – M2S1D – M3S4
2.	NHP 22	M1S1 – M1S2 – M1S4 – M1S3 – M2S1B – M3S3 – M3S8
3.	NSP 16	M1S1 – M1S2 – M1S3 – M2S1A – M2S1B - M2S1C – M3S8
4.	NSP 20	M1S1 – M1S2 – M1S4 – M2S1B – M3S1 – M3S4 – M3S3 – M3S8
5.	NSP 22	M1S1 – M1S4 – M1S3 – M1S2 – M2S1A – M2S1C – M3S3 – M3S4 – M3S8
6.	NHA 7	M1S1 – M1S2 – M1S4 – M1S3 – M2S1B – M3S1 – M3S3 – M3S2 – M3S8
7.	NSA 14	M1S1 – M1S4 – M2S1C – M3S2 – M3S8
8.	NSA 15	M1S1 – M1S4 – M2S1B – M2S1A – M3S3 – M3S5
9.	IHP 3	M1S1 – M1S2 – M1S4 – M2S1B – M3S3 – M3S8
10.	IHP 4	M1S1 – M1S2 – M1S4 – M1S3 – M2S1D – M2S1B – M3S2 – M3S1 – M3S3 – M3S8
11.	IHP 5	M1S3 – M1S1 – M1S2 – M2S1B – M3S3 – M3S8
12.	IHA 11	M1S1 – M1S2 – M2S1B – M3S1 – M3S3 – M3S8
13.	IHA 22	M1S1 – M2S1A – M3S2 – M3S1 – M3S8

Table 6

Move arrangements found in DIs written by NES and IND PhD students

No.	Move arrangement	Frequency	DIs
1.	M1 + M3	9	NHP 1, NHP 6, NHP 12, NHP 24, NHP 25, NSP 4, NSP 23, NHA 2, NHA 16
		5	IHP 2, IHP 12, IHA 4, IHA 13, IHA 14
2.	M1 + M2 + M3	13	NHP 17, NHP 22, NSP 16, NSP 20, NSP 22, NHA 7, NSA 14, NSA 15, IHP 3, IHP 4, IHP 5, IHA 11, IHA 22
3.	M1 + M3 + M2 + M3	5	NHP 2, IHP 7, IHP 11, IHA 3, IHA 12
4.	M1 + M2 + M1 + M3	7	NHP 18, NHA 15, IHP 13, IHP 15, ISP 14, IHA 5, ISA 8
5.	M1 + M2 + M3 + M1 + M3	6	NHP 5, NHP 15, ISP 23, IHA 15, ISA 6, ISA 7
6.	M1 + M3 + M2 + M1 + M3	2	NHP 4, NSP 11
7.	M3 + M1 + M3	5	NSP 1, NSP 17, NHA 11, ISP 6, ISP 19
8.	M1 + M2 + M1 + M3 + M2 + M3	3	NHP 10, NHA 9, NHA 23
9.	M3 + M1 + M3 + M1 + M3	2	NSP 14, NHA 18
10.	M1 + M2	2	IHP 1, ISP 22
11.	M1 + M2 + M3 + M1 + M2 + M3	2	IHP 16, IHP 25
12.	M1 + M2 + M1 + M2 + M3	3	IHP 9, IHP 18, IHA 6
13.	M1 + M2 + M3 + M2 + M3	5	IHP 22, IHA 19, ISA 10, ISA 16, ISA 25
14.	M1 + M2 + M1 + M2 + M1 + M2 + M3	2	IHA 18, IHA 20
15.	M1 + M2 + M3 + M2 + M1 + M3	2	IHP 10, ISA 1

It was also found that Move 3 was used similarly as the first move in the DIs of both groups, with 16 occurrences in the NES (16%) and 11 in the IND (11%) groups, but only in the SP and HP disciplines (HP = 6 and SP = 5 in the NES group) and (HP = 3 and SP = 3 in the IND group); see Table 6. As can be seen in Examples 1 and 2 written by NSP 14 and ISP 15, the writers used Move 3 "announcing research" as the first move to explain what their present research was about; this was accomplished by describing the objective of the research in terms of what the study intended to achieve. The writer of NHP 8 presented the "purposes, aims, or objectives" in Example 2 by explaining the objectives of the study in clear language.

Example 1 by NSP 14: In this study, I analyze the linguistic characteristics of research articles published in academic journals, taking into account the varied realizations of research reports in fundamentally diverse disciplines. My goal is to identify linguistic variation across research articles. → **M3 as the first move (M3S2)**

Example 2 by ISP 15: The modern dissertation serves many purposes. First and foremost, it documents the author's innovations and novel contributions to his or her field, fulfilling the requirements for a Ph.D. My first priority is to accomplish this to the satisfaction of my committee members. → **M3 as the first move (M3S1)**

Table 7

Twenty-five DIs starting with move 3

No.	DI	DIs starting with Move 3
1.	NHP 3	M3S4 – M1S3 – M2S1B – M1S4 – M2S1B – M3S1 – M3S7 – M3S3 - LP – M3S8
2.	NHP 8	M3S1 – Pro – M1S1 – M1S2 – M1S3 – M1S4 – M1S2 – M3S2 – M2S1B – M3S3 – M2S1B – M3S8 – M3S5 – M3S8
3.	NHP 21	M3S2 – M1S1 – M1S4 – M2S1D – M3S4 – M2S1A – M1S4 – M1S2 – M2S1B – M3S8
4.	NHP 23	M3S2 – M1S1 – M1S3 – M2S1B – M2S1A – M3S3 – M1S4 – M3S8
5.	IHP 6	M3S2 – M1S1 – M1S2 – M1S4 – M2S1D – M2S1B – M3S3 – M3S4 – M3S6 – M1S3 – M2S1B – M2S1A – M3S2 – M3S8
6.	IHP 14	M3S2 – M1S4 – M1S2 – M2S1A – M1S3 – M2S1D – M2S1B – M3S3 – M3S8
7.	NSP 1	M3S2 – M1S1 – M1S4 – M1S2 – M3S1 – M3S3 – M3S4 – M3S5 – M3S7 – M3S8
8.	NSP 3	M3S2 – M1S1 – M1S4 – M1S2 – M3S4 – M1S3 – M1S4 – M2S1A – M3S8
9.	NSP 5	M3S8 – M1S4 – M2S1B – M2S1C – M1S2 – M1S4 – M2S1D – M2S1B – M2S1D – M3S2 – M3S3 – M2S1D – M2S1C
10.	NSP 6	M3S1 – M1S2 – M1S4 – M2S1B – M2S1C – M2S8
11.	NSP 14	M3S2 – M1S1 – M1S2 – M1S3 – M3S3 – M3S1 - M1S3 – M3S2 – M3S4 – M3S3 – M3S8
12.	NSP 15	M3S7 – M3S1 – M2S1C – M3S8 – M1S3 – Conv
13.	NSP 17	M3S5 – M1S3 – M1S4 – M3S8
14.	NSP 24	M3S4 – M2S1C – M3S3 – M3S4 – LR – M3S8 - Concs
15.	NHP 11	M3S2 – M1S3 – M3S8 – M3S3 – M3S8 – M3S4 – M3S3 – M3S8

No.	DI	DIs starting with Move 3
16.	NHP 18	M3S2 – M1S1 – M1S4 – M3S3 – M1S3 – M1S4 – M3S1 – M3S3 – M3S4 – M3S8
17.	NHP 21	M3S1 – M2S1A – M2S1C – M3S3 – M3S5
18.	ISP 2	M3S8 – M1S1 – M1S2 – M1S4 – M3S2 – M2S1B – M2S1A – M3S1 – M3S7 – M3S4 – M3S3 – Lim – M1S3
19.	ISP 3	M3S2 – M3S4 – M2S1B – M3S7 – M2S1C – M1S4 – M2S1B – M2S1D – M2S1B – M2S1C – M1S2 – M2S1B – M3S4 – M3S3 – M2S1C – M3S3 – M3S8
20.	ISP 6	M3S2 – M1S1 – M1S2 – M1S4 – M3S1 – M3S4 – M3S3 – M3S5 – M3S6 – M3S8
21.	ISP 10	M3S4 – M1S1 – M1S2 – M1S4 – M2S1A – M2S1B – M3S1 - M2S1C – M3S7 – M1S3 – Abv – M3S3 – M3S4 – Del – M3S8
22.	ISP 11	M3S2 – M3S4 – M3S3 – M1S1 – M1S2 – M1S4 – M3S4 – M3S3- M2S1B – M3S5 – M3S8
23.	ISP 15	M3S1 – M1S1 – M1S4 – M2S1B – M2S1D – M1S4 – M1S2 – M1S3 – M3S3 – M3S1 – M1S4 – M1S3 – M1S4 – M2S1B – M2S1A – M3S4 – M3S3 – M2S1C – M3S1
24.	ISP 17	M3S2 – M1S1 – M1S4 – M2S1B – M1S4 – M1S2 – M3S4 – M1S4 – M3S3 – ABg – Ortho – M3S8
25.	ISP 19	M3S4 – M3S2 – M1S2 – M1S3 – M3S3 – M3S8

The characteristics of move reversals were found in both groups. The present study found that Move 3 preceded Move 1 and Move 3 preceded Move 2 in the DIs. There were 20 introductions (10%) with the pattern of Move 3 preceding Move 1, and 39 introductions (19.5%) in which Move 3 preceded Move 2. Twenty-nine DIs written by IND (29%) and 28 DIs written by NES (28%) students contained a move reversal in Move 3. In other words, these DIs showed patterns in which Move 3 occurred before Move 2. It is important to note that all of the Move 3 patterns in this arrangement were placed in the first part immediately after Move 1, while Move 2 was used in the following part.

It is interesting to note that the move pattern of M1 + M3 was employed in both IND and NES writers' DIs. It was found in 14 cases: nine NES writers, NHP 1, NHP 6, NHP 12, NHP 24, NHP 25, NSP 4, NSP 23, NHA 2, and NHA 16, and five IND writers, IHP 2, IHP 12, IHA 4, IHA 13, and IHA 14 (see Table 4.19).

Moreover, the occurrence of recursive moves was found in both groups of writers. There were 51 cases in which recursive moves were found; that is, 30 DIs written by IND and 21 DIs written by NES students. All of them displayed the pattern of M1 + M2 + M1, but these occurrences revealed different uses of the steps. As an illustration, Example 3 indicates that the IND writer first synthesized prior research that further supported the need to study the research problem; the writer then proceeded to present the problem in the research, which was immediately followed by the presentation of the review of previous research with a problem-solution orientation. In Example 4, which was written by a NES writer, Move 2 did not appear to indicate a significant problem in terms of attempting to address the problem of the earlier method's non-applicability to some cases.

Example 3 By NES xx	**According to 2000 census,**[5] the population of Pontianak is 554764, with 31.2% Chinese, 26.1% Malays, 13.1% Buginese, 11.7% Javanese, 6.4% Madurese, 11.5% Dayaks and other ethnicities. For people who are not Chinese, in the past, the Chinese people belong to two groups, the totok and the peranakan.[6] **However, this differentiation is no longer used for the present day**. For the Chinese people, there are smaller ethnic groups of Chinese who speak different Chinese dialects. **According to Lim and Mead (2011, p. 2)**, there are fourteen Chinese dialects in Indonesia: Hokkien, Cantonese, Hakka, Teochew, Hainan, Hokchiu, Henghua, Hokchia, Kwongsai, Chao An, Luichow, Shanghai, Ningpo, and Mandarin. (LIN 17)	→ Move 1 Step 4 (M1S4) → Move 2 Step 1B (M2S1B). → Move 1 Step 4 (M1S4)
Example 4 By IND xx	**In the field of environmental engineering,** concern is growing regarding trace chemical contaminants that disrupt the natural functions of hormonal systems, known as endocrine disruptors. Two potent endocrine disruptors, the natural estrogens, estrone and estradiol, are present in wastewater effluents. **However**, the concentration of estrogens in wastewater influents and effluents is not routinely measured. **Estrogens are known to cause endocrine responses in aquatic species**. Wastewater effluent is known to contain estrogens and has been shown to cause endocrine responses in aquatic species. Models developed for the removal of estrogens in wastewater treatment systems are dependent upon the accuracy of estimates of wastewater influent estrogen concentrations. (EGEN 5)	→ Move 1 Step 1 (M1S1) → Move 2 Step 1B (M2S1B) → Move 1 Step 3 (M1S3)

The sixth similarity was the pattern of M3 + M2 + M3, which represented the characteristics of both move reversals and move recursives. There were 37 cases (15 written by IND and 22 written by NES) in which Move 3 was employed twice to display the pattern of M3 + M2 + M3. These phenomena represent the characteristics of both move reversals and move recursives.

Table 8

Organization of moves in four disciplines written by NES and IND

	Fields	Frequency	*Mean*	*SD*
NES	HP	243	9.72	4.01
	SP	233	9.32	4.08
	HA	234	9.36	2.80
	SA	242	10.04	2.16
Total (NES)		952	38.44	13.05
IND	HP	252	10.08	3.65
	SP	324	12.96	7.71
	HA	225	9.00	2.87
	SA	262	10.48	2.87
Total (IND)		1063	42.52	17.1
TOTAL		2016	**80.96**	**30.15**

As shown in Table 6, the overall *Mean* and *SD* were 80.96 and 30.15, respectively. The *Mean* and *SD* of DIs written by NES students were 38.44 and 13.05, respectively, while the *Mean* and *SD* of DIs written by IND students were 42.52 and 17.1, respectively. Based on the findings, it can clearly be seen that DIs written by IND writers had higher percentages (*Mean* = 42.52, *SD* = 17.1) of move organizations than did those produced by NES writers (*Mean* = 38.44, *SD* = 13.05). This might lead to the inference that the IND PhD students were also aware of the organization of introductions. Some additional steps were revealed in the findings. Sixty-five (32.5%) of the 200 DIs had additional steps; thirty-seven (18.5%) DIs were written by NES and 28 (14%) by IND PhD students. In addition, the analysis of move organization revealed that only 13 (6.5 %; NES = 4%, and IND = 2.5 %) of the 200 DIs used the Move 1 + Move 2 + Move 3 pattern. The result revealed that the pattern in the studied DIs generally supported Bunton's framework, but that other move organizations differed.

New steps

The researchers also found three new steps that occurred in the 200 DIs written by NES and by IND PhD students in four different subject fields. The three new steps were limitations, hypotheses, and assumptions of the study. These three steps were proposed as new steps for two main reasons, namely specific functions and occurrences across fields. First, the three steps (limitations, hypotheses, and assumptions of the study) were found to have specific functions that did not belong to any of the steps in the previous models. The other criterion was that the new step must have occurred at least twice in each discipline in at least two areas of the domain of knowledge in both corpora; that is, the NES IDs and the IND IDs. For example, the first new step, limitations, occurred twice in the SP field, three times in the HA field, and 12 times in the SA field in the DIs written by NES. Moreover, in the DIs written by IND, limitations occurred twice in the SP field, five times in the HA field, and ten times in the SA field. These three new steps within Move 3 were found to occur in the last part of the DIs in this study. Therefore, it can be concluded that they belong to Move 3. Previous studies, such as those by Samanhudi (2018), Arsyad (2013), and Suryani et al. (2013), which investigated introductions written by Indonesian and English writers in the field of applied linguistics, also found several new additional steps.

Limitations

Example 16 This study had several limitations. First, because of the purposeful nature of the selection criteria used to choose students for interviews and the resulting small sample size, the transferability of the findings to other settings may be limited. However, I have taken care to describe in detail the engineering program and the student population from which these data were collected, so that faculty and administrators of institutions of comparable size will be able to decide if the results obtained in this study are applicable to their engineering programs. **(NHA 20)**

Example 17 This study has several limitations. The first limitation is that, although the participants of this study are faculty members, they were drawn from the population of one college, and they were not randomly selected. The second limitation was this study employed survey and interviews. … **(ISA 5)**

Hypotheses

Example 31 Hypothesis

Governance of a system-of-systems containing SOA delivering information-based IT Services can be accomplished through adherence to engineering principles, an innovative application of IEEE Standard 828-2005, and adjusted implementation of the ITIL process framework to define Enterprise Configuration Management (ECM) within a financial IT environment. **(NHA 4)**

Example 32 For the purpose of this study, at least four outcomes were predicted as null hypotheses:

Null hypothesis 1: Subjects' teaching methods do not correlate with their perceptions of the advantages and disadvantages of mobile computing. Teaching method was defined as the instruction technique faculty used to deliver subject matters to his or her students. This study employed five teaching methods commonly used in college level based on Grasha & Yangarber-Hicks (2000) and Grasha (2002) observations: (1) Lecture, (2) Discussion, (3) Students lead the class, (4) Students work on projects, and (5) Combination of the four methods. **(ISA 5)**

Assumptions of the study

Example 34 The following assumptions are understood: 1) Ethical dilemmas are encountered in the teaching process of developmental education students. 2) Responses to questionnaire will be truthful and accurate. 3) Community colleges offer developmental education classes. **(NSA 1)**

Example 35 Assumptions of the study are listed below:

1. Students were honest in completing the self-report surveys and responding to interview questions.
2. Students had prior experience using computer and web browser.
3. Students were able to read and communicate in English.
4. Students enrolled in the three different classes had the same basic or minimum mathematical skills required to engage in interactive learning modules. **(IHA 17)**

DISCUSSION

Several significant points will be discussed based on the main findings of the present study. The results of the study revealed that the two groups of PhD writers had more similarities than they did differences in terms of the frequency of move use and move arrangement. It was

found that Move 2 was used least frequently by both groups of PhD students; moreover, Move 2 was omitted in some of the DIs written by the two groups. The lowest frequency and the omission of Move 2 were also reported in the related earliest research on DIs (e.g., Bunton, 2002; Khan & Mehmood, 2014; Nguyen & Pramoolsook, 2014; Sheldon, 2011; Soler-Monreal et al., 2011). A study by Soler-Monreal et al. (2011) showed that, in Spanish DIs, the common expository pattern when presenting information was from Move 1 to a specific Move 3. Some scholars (e.g., Khan, 2014; Taylor & Chen, 1991) have claimed that the omission of Move 2 was characteristic of Asian writers; L2 learners tended not to criticize previous works, but to criticize educational situations instead (Lee, 2001; Taylor & Chen, 1991). However, the results of the present study showed that both groups of PhD student writers across the disciplines tended to avoid Move 2. According to Zainuddin and Shaari (2017), establishing a niche is considered to be the most important move in DIs according to the CARS framework. Establishing a niche refers to researchers describing the significance of the research and explaining why a study needs to be conducted. Both groups of writers' omissions of Move 2 noted in the present study may be considered to have been due to inadequate exposure to conventional rhetorical styles and training, and may not have been due to differences between cultures.

The results of the study showed that Move 3 was used as the first move by both groups of PhD writers. The results of this study partially confirmed the findings in the study by Kawase (2018), who found that Move 3 was used as the first move in SP introductions, but not in HP introductions. According to Kawase (2018), Move 3 was used as the first move to signify the main objective of the research with a short reference to the research scope of previous studies. It is important to note that it may be possible that Move 3 was found in SP introductions but not in HP introductions because the domains of knowledge may have been categorized differently in the present study. The results of this study confirmed that the selections of moves, steps, and vocabulary were determined by discipline-specific factors, such as the common organization of institutional conventions, the informative requirements of specific discourse communities, and the discipline dependency of introductions (Khan & Mehmood, 2014)

The characteristics of move reversal were found in both groups. It was found that Move 3 preceded Move 1 and that Move 3 also preceded Move 2. In other words, the findings of the current study regarding the sequencing of moves showed a specific to a general flow of ideas that concluded with a specific move. This rhetorical organization did not conform to Swales' and Bunton's (2002) CARS framework. Moreover, move reversal has been found to be common in introductions written by Spanish scholars (Salom et al., 2008), Vietnamese scholars (Nguyen & Pramoolsook, 2014) and Pakistani scholars (Shehzad & Abbas, 2015), as well as by NES scholars (Dasilveira, 2002; Dudley-Evans, 1998). It is well accepted that linear writing is more easily comprehensible than is nonlinear writing, and that nonlinearity appears to position a piece of writing as being "reader responsible", which requires readers to make an effort to expand the meaning of the text. However, the question that may be raised is whether the identified sequence of rhetorical organization also serves communicative purposes in research.

Based on the findings, it is interesting to note that IND writers used more moves than did NES writers. The results of the present study are in line with the findings of previous studies (e.g., Mirahayuni, 2002. It is possible that L2 learners find it challenging to express their ideas

succinctly due to their lower levels of fluency, insufficient knowledge of idiomatic expressions, and familiarity with the cultural context of the language and the conventions of writing. Furthermore, they may feel pressure to demonstrate their ability to write, as well as to showcase their knowledge of their fields, thus resulting in longer written texts. For novice writers, particularly NNS writers, meeting the research community's expectations is considered to be a highly challenging task (Martín-Martín, 2005; Swales, 1990). However, studies by Sheldon (2011) and by Aggarwal (2015) had different findings: Both studies compared the move occurrences in DIs between NNS and NS, and found that NS tended to use more moves in their DIs. The findings regarding the number of moves used by NS and NNS were inconclusive. However, it is important to note that Sheldon (2011) and Agrawall (2015) compared introductions to RAs of which the authors were considered to be experts in the field, while the writers were doctoral students in the present study.

CONCLUSION

The present study aimed to identify move organization, as well as the similarities and differences in the DIs written by NES and by IND PhD students in four different domains of knowledge, namely HP, SP, HA, and SA. The results of this study revealed that the DIs written by NES and IND PhD students followed the framework of Bunton's (2002) CARS, as all three of the moves and the 16 steps were employed by NES and IND PhD students; however, the frequencies of the moves and steps differed. It was found that the IND PhD students wrote more words and used more rhetorical moves and steps than did NES students in their DIs. Move 2, which is considered to be an important move to state the need to conduct a study, was omitted by both groups. Moreover, both move recursives and move reversals were used by both groups of PhD writers. Three new steps were found in the present study, namely limitations, hypotheses, and assumptions of the study.

A main pedagogical implication of this study is that the omission of Move 2 by both groups of writers may indicate insufficient training in how to write and how to use Move 2 effectively when writing DIs. Training in the successful composition of effective DIs may be needed for both NES and NNS. Another important implication concerns the need to make both teachers and L2 learners aware of methods for writing precise and concise DIs. L2 learners tend to use more moves and write longer introductions; as mentioned previously, they may lack sufficient writing and language ability to write sufficiently precisely and succinctly to meet the expectations of the academic and research communities. Rigorous training should be given to graduate students to familiarize them with the rhetorical styles expected by the research community of which they aim to become members. They should be made aware that a DI is an important element, if not one of the most important elements, of a dissertation because it states the research contributions to the field of the study, as this is an essential factor in any research study that dissertation committee members and reviewers for publication expect to see. Greater awareness of and the ability to create logical ideas for effective introductions will make the contributions of the research projects more visible and will improve perceptions of them.

Finally, the present study did not examine the quality of the DIs. Even though the dissertation

chapters were selected from successful research projects, the quality of each DI was not examined. Assessing the quality will provide further insights into the move arrangement in DIs with different degrees of quality. Moreover, the present study did not examine whether both recursive and rehearsal move arrangements that did not follow the CARS framework served communicative and academic purposes. It will be interesting for future researchers to also examine whether these different move arrangements achieve the communicative and academic purposes of writing DIs. This study aimed to examine the overall picture of move arrangement between NES and IND PhD students across disciplines. It will also be interesting to investigate the differences in move arrangements in DIs written by NS and NNS writers in specific areas. Finally, as this study focused on DIs written by NES and NNS graduate students, it would be interesting to investigate DIs written by novice NNS and NS writers and by expert writers. Knowledge about the aforementioned areas will help to extend our knowledge of move analysis and move arrangement, particularly with regard to L2 writing instruction.

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