

Review of the Discussion Section of Research Articles: Rhetorical Structure and Move

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Submitted: 28/5/2021. Revised edition: 24/10/2021. Accepted: 22/11/2021. Published online: 15/12/2021

ABSTRACT

The discussion section forms an integral part in the writing process of a research article (RA). Research authors find it difficult to write and produce a well-structured discussion for their findings. The reason could be due to the unawareness of the main components (rhetorical moves) that shape this section. Therefore, this paper aims to provide a review of the studies that have been done to analyze the discussion section of RAs over the last 36 years. Also, this review seeks to examine the discussion section of RAs across various scientific disciplines and different types of journals. The review showed that the rhetorical structure of RAs discussion section witnessed some changes over the course of time. New moves such as Research Implications and Research Limitations started to be parts of the discussion section of RAs. In addition, it was revealed that differences in writing the discussion section can be varied broadly across disciplines such as soft sciences (e.g., applied linguistics, sociology, psychology) and hard sciences (e.g., engineering, chemistry, biology) and slightly across types of journals such as ISI and local journals. In conclusion, this paper offered several suggestions for further research to be conducted in the area.

Keywords: Discussion section, rhetorical structure, moves, steps

1.0 INTRODUCTION

Nowadays, the research article (RA) has become the gateway for the exchange of knowledge among researchers from different discourse communities. This growth in published research articles along with Swales' (1990) discussion of communicative moves in research has turned RA into a high-status genre to be examined in various studies concerned with academic writing. An important and most crucial section of RAs is the discussion section as highlighted by numerous scholars (e.g., Basturkmen, 2012; Dujsik, 2015; Moyetta, 2016). Basturkmen (2012) has stated that the discussion section is essential in RAs, whereby, according to Amnuai (2017), the discussion is one of the most demanding sections for researchers, especially for novice writers.

The discussion section of an RA has several functions. Moyetta (2016) asserts that the primary purpose of the discussion section is to state the results and introduce the work of others. In this, referring to literature leads to confirming, comparing or contradicting research findings

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(Swales, 2004). On the other hand, Basturkmen (2012) has argued that this section allows researchers to make claims on the integration of the results and state the contributions to disciplinary knowledge. Similarly, Sheldon (2013) states that the most substantial claims of a study would be made in this section. Nonetheless, Dujsik (2015) has noted that the discussion section is focused on presenting and interpreting findings. Therefore, this section is not limited to restating findings from the research but also explaining them by providing reasons and examples that could support the arguments. Beside comparing the findings with the literature and stating claims, this section would sometimes include limitations, recommendations, and implication of the study (e.g., Al-Shujairi *et al.*, 2020; Fryer, 2012; Moyetta, 2016).

A valuable discussion section should be based on points, instead of facts, as argued by Olsen and Huckin (1990). Facts could be numbers or statements made in the RA, while points would be arguments, reasons, and explanations for further clarifications. Research writers have the benefit of flexibility in deciding the possible points to be included and highlighted in the discussion. Therefore, discussions should go beyond describing the findings or merely summarising the research results. It is the section where writers are required to explain their results, provide examples for further clarification, and make comparison with existing literature and of course state their claims by providing convincing evidence. These multiple tasks that writers need to do in the discussion section are essentially what writing scholars termed as communicative functions in a text. In genre analysis, these communicative functions are realized by moves and steps which together fulfill the communicative purpose of the RA discussion section.

A rhetorical move is generally viewed as a function of a specific segment of a text (Ruiying & Allison, 2003). In other words, a move can be a sentence or group of sentences or even a paragraph that serve one or multiple communicative functions in a text (Al-Shujairi *et al.*, 2020). On the other hand, a step is a very specific rhetorical mean employed to reveal and realize the multiple functions of a move (Ruiying & Allison, 2003). To put it simply, a step is at a lower level than a move and it functions as an ‘elaborator’ of a move. In discussion section, therefore, every single sentence has a communication function and it contributes to the function of the discussion as a whole. When rhetorical moves and steps are discussed, the term essentiality comes up. According to Can *et al.* (2016), essentiality is a measure to the extent of a move or step being necessary for the genre under investigation. The range of essentiality in employing the move can be estimated further (Can *et al.*, 2016), which may help the research community to understand the differences and similarities in the employment of moves, and subsequently, steps in various fields of science. A move/step is considered obligatory when it occurs in 100% of the corpus, conventional in between 60%-99%, and optional in less than 60% (Kanoksilapatham, 2005). In this review research, the author aims to investigate:

- 1) the rhetorical changes occurred in RAs discussion section over the last 36 years.
- 2) the variations in the employment of rhetorical moves of RAs discussion section across disciplines and types of journals.

2.0 RESEARCH METHODOLOGY

The studies that have been reviewed in this paper are of three types. One is the renowned past studies that introduced new models of rhetorical moves in RAs discussion section. Example of these studies are Hopkins and Dudley-Evans (1988), Swales (1990), Nwogu (1997) and Peacock (2002). The reason for considering such studies as renowned is because their suggested frameworks of moves were later adopted and adapted by recent research on move analysis. This type of studies was reviewed chronologically. Two is the studies that examined the rhetorical moves of the discussion section with regards to disciplinary variations. Although, a large number of research was conducted to investigate the said issue, the current paper reviewed studies that investigated different disciplines (e.g., applied linguistics, history, dentistry, medicine, law, accounting). In other words, the researcher avoided looking at more than a paper that explored the same discipline. The review of this part was done based on the similarities and differences that could be found between disciplines. Three is the research that focused on comparing the rhetorical structure of RAs published in different types of journals such as local vs international, high impact factor vs low impact factor. To do this, the researcher highlighted and discussed the similarities and differences that could be found in RAs published in different types of journals.

3.0 FINDINGS AND DISCUSSION

In this part of the paper, the researcher presents the history of move models of RAs discussion section and how these models have been developed during the last 36 years. Later in this part, the researcher reviewed the most recent studies that have been done to examine the rhetorical moves with regards to the disciplinary variations and types of journals.

3.1 The Renowned Models of Moves of the Discussion Section Over the Last 36 Years

In the literature, several frameworks were introduced to describe the rhetorical moves that shape the discussion section of RAs. This paper presents and explains the most established models of the rhetorical moves in this section. The first model was established 36 years ago by Smith (1984), who proposed a four-move model based on a corpus constructed from British Medical Journal. The framework consisted of the following moves: Explain Method, Interpret Results, Refer to Literature and Implication. Four years later, Hopkins and Dudley-Evans (1988) introduced a framework of eleven moves that explain the discussion of results of both RAs and dissertations. The framework was based on the analysis of MSc thesis from the biology department of Birmingham University and RAs on irrigation and drainage (Table 1). The study showed that move 2 (Stating the Results) was the only move that was considered optional.

Table 1 Eleven-Move Model by Hopkins and Dudley-Evans (1988)

Moves	Description
Move 1	Give background information
Move 2	Stating the results
Move 3	Stating expected or/and unexpected outcome
Move 4	Referring to literature (Compare and contrast)
Move 5	Provide an explanation for an unexpected outcome
Move 6	Give examples
Move 7	Deduction
Move 8	Suggest hypothesis
Move 9	Referring to past studies (Support)
Move 10	State recommendation for further research
Move 11	Give justification

The framework by Hopkins and Dudley-Evans (1988) described the first move to be Giving Background Information and the final move as Giving a Justification. This framework also had two moves that were labelled as Referring to Literature. The first Referring to Literature move was to compare and contrast findings from past studies while the second one was to support an argument or a claim in the study. The inclusion of more detailed moves may be explained by their investigation of not only RAs but also dissertations. Compared to the framework by Smith (1984), the framework proposed by Hopkins and Dudley-Evans (1988) was considered more practical as all eleven moves described in the framework provided a more extensive description of the discussion section.

At the beginning of the 1990s, Swales (1990) proposed a framework that consists of eight rhetorical moves in a discussion section of RAs (Table 2). The framework was similar to Hopkins and Dudley-Evans' (1988); with the first six moves have exactly the same description. However, moves 7 and 8 from the framework by Hopkins and Dudley-Evans (1988) were merged as a single move called Deduction and Hypothesis in Swales' (1990) framework. The move on Referring to Literature in Swales's (1990) framework have both functions of supporting the investigation of a study and to comparing and contrast with past studies. The only move that was not found in the framework by Swales (1990) was to Give Justification, which could be due to the different types of the investigated corpus. While Hopkins and Dudley-Evans's (1988) model was based on the discussion of dissertations and RAs in the field of biology, Swales's (1990) model was based only on the discussion section of RAs in the field of applied linguistics. Another reason could also be that function giving justification have been merged with the move on Explanation. In this, authors might explain their findings by giving justification supported with examples or reference to literature.

Table 2 Eight Moves Model of Swales (1990)

Moves	Description
Move 1	Provide background information
Move 2	Statement of findings
Move 3	Un/expected outcome
Move 4	Referring to past studies
Move 5	Explanation
Move 6	Exemplification
Move 7	Deduction and Hypothesis
Move 8	State recommendation for further research

Dudley-Evans (1994) developed a nine-move sequence following the framework from Swales (1990), which was described by Peacock (2002) as "the complete description of moves in the discussion section of research articles" (p. 224). According to Dudley-Evans (1994), the discussion section involved three parts (Introduction, Evaluation, and Conclusion) with move cycles that combine two or more of the following nine moves:

- Move 1: Background Information (background about theory/research aims/methodology)
- Move 2: Statement of Results (stating the findings' numerical value or reference to a graph/table)
- Move 3: Findings (same as move 2, but without a reference to a graph or table)
- Move 4: Un/expected Outcome (a comment on whether the result is expected or not)
- Move 5: Reference to Previous Research (referring to literature to compare and contrast)
- Move 6: Explanation (provide reasons for unexpected results)
- Move 7: Claim (a generalisation arising from the results: contribution to the research)
- Move 8: Limitation
- Move 9: Recommendation (suggestions for future research).

Dudley-Evans's (1994) model revealed two new moves that are not included in the aforementioned models, which are Claim and Limitation. According to Moyetta (2016), the move on Claim would serve stating generalisations based on results from the research or describing the contribution of the research to the literature. The move on Limitations is to indicate the limitations of the research. Based on this framework, research writers are able to make claims or generalisations of the findings, indicate the limitations of the study and end the discussion section with a recommendation for further research. Unlike previous frameworks, the one by Dudley-Evans (1994) provides two results-related moves. The first result is described through the move on Statement of Results, whereby statistics and references to graphs and tables are presented. Meanwhile, the second result would be related to the move on Findings, whereby the primary outcome is stated without a

reference to a graph/table. Such specific moves makes this framework provides more detailed writing of the discussion section, which would eventually strengthen the practicality of the research.

Despite the few previously mentioned frameworks on moves in the discussion section, more studies were needed as this section is viewed to be the most significant and often the most difficult section to write (Cömert & Al-Beyati, 2019). Berkenkotter and Huckin (1995) stated that the limited attention given to the discussion section of RAs was an "unfortunate oversight" as the discussion might be the most crucial section (p. 40) in an RA. Shortly, two studies had been conducted to investigate the discussion section in RAs, with one by Holmes (1997) and another by Nwogu (1997). The study by Holmes (1997) was based on Dudley-Evans's (1994) framework of nine moves on the discussion section of 30 RAs in three disciplines, which were history, political science, and sociology. A modified framework of eight moves was developed as a result of the study (Table 3).

Table 3 Eight-Move Model by Holmes (1997) based on Hopkins and Dudely-Evans (1988)

Moves	Description
Move 1	Provide background information
Move 2	Statement of results
Move 3	Reveal expected or unexpected outcome
Move 4	Referring to past studies
Move 5	Explanation of unsatisfactory finding
Move 6	Generalisation
Move 7	Recommendation
Move 8	Outlining parallel or subsequent developments

Except for move 8 (Outlining Parallel or Subsequent Developments), the rest of the moves in Holmes's (1997) model were similar to those from previous frameworks (e.g., Dudley-Evans, 1994; Swales, 1990). According to Holmes (1997), move 8 was only detected in RAs within the field of history and served as a "presentation in summary form of data that was additional to that given in the main body of the article" (p. 324). However, further explanations about the nature of this move were not provided as the move had only occurred in less than half of the history corpus, which was barely typical to this specific discipline.

Nwogu's (1997) model, on the other hand, was based on Swales's (1990). Nwogu analysed the corpus of 30 RAs in the field of medical science. His model was the first to propose the concept of steps, along with the moves, in a discussion section. These steps are understood to be "constituent elements or sub-moves" (p.135) to the broad function of a move. Besides, Nwogu introduced three significant moves in the model, which consisted of several steps (Table 4).

Table 4 Moves and Steps Model by Nwogu (1997)

Move	Description	Steps
Move 1	Highlighting overall research outcome	
Move 2	Explain specific outcome	Step 1: Stating specific outcome Step 2: Interpret the outcome Step 3: Indicate the significance of the outcome Step4: Contrast current and past outcomes Step5: Indicate limitations of findings
Move 3	State research conclusion	Step 1: Indicate research implications Step 2: Promote future research

The move on Highlighting the Overall Research Outcome is a stand-alone move without any steps. This move is known as Stating the Results by Hopkins and Dudely-Evans (1988), Statement of Findings by Holmes (1997) and Swales (1990), as well as Findings by Dudley-Evans (1994). Despite the different names given to this move, the functions is found to be the same, which is to state the main research findings. On the other hand, the move on Explain Specific Outcome consists of five steps, and the move on State Research Conclusion has two steps. The most exclusive and new step in Nwogu's (1997) framework is Indicate the Significance of the Outcome. This step was derived from the analysis, whereby research writers in the field of medicine tended to show the importance of research outcomes in the discussion section. Thus, this step can also be assumed as being typical to medical discipline but not to others (e.g., applied linguistics, sociology, history).

Although these mentioned frameworks/models are based on established research in the area of genre analysis, it was not until 2002 that frameworks from multiple distinguished disciplines started to appear. One of the most significant models of rhetorical moves in the discussion section of an RA was proposed by Peacock (2002). Based on the framework by Dudley-Evans (1994), the discussion section across seven disciplines, which were physics and material science, biology, environmental science, business, language and linguistics, public and social administration, and law were investigated. The study by Peacock was focused not only on disciplinary variations but also native and non-native speakers (NS/NNS), which resulted in a revised version of the eight-move model in writing a discussion section. Table 5 illustrates the moves and their definitions.

Table 5 Eight Moves Analytical Framework Modified by Peacock (2002)

Move	Name	Definition
Move 1	Information move	Provide background information about theory/research purpose/method
Move 2	Finding	Stating the main results with or without a reference to a graph or table
Move 3	Un/expected outcome	Commenting on whether the findings are expected or not
Move 4	Reference to previous research	Referring to past studies for the purpose of comparison
Move 5	Explanation	Give reasons for expected or unexpected Finding
Move 6	Claim	State the research contribution
Move 7	Limitation	State the Limitation of the study
Move 8	Recommendation	Suggesting future research to be undertaken

Although the moves in the framework by Peacock (2002) have no significant difference to the framework by Dudley-Evans (1994), the former was the first to offer clear definitions of the moves, as presented in Table 5. Move label does not always demonstrate the function of the move. In some occasions, the name of the move might not clearly reflect its' function. For example, one may argue what information should be given in move on Information. Here, a clear definition of the move is needed (Table 5). Thus, Peacock's (2002) definitions of the moves helped to illustrate the functions of the various moves of the discussion section comprehensibly.

In 2003, Ruiying and Allison (2003) introduced a new model of moves and steps based on the discussion and conclusion sections of applied linguistics RAs (Table 6). The model consists of seven major moves and ten steps. Unlike the framework of Peacock (2002), Ruiying and Allison's (2003) model had several steps for some of the moves that were unique to this model. These moves were Comment on Results, Evaluate the Research and Deductions from the Research. This model further highlighted that research writers in applied linguistics had focused extensively on generalising research findings, which was illustrated in two steps; Interpreting Results and Evaluate Findings. Both steps indicate that general and specific claims about the generalisability of the results would be made in the RAs within the field of applied linguistics. However, both frameworks (Peacock, 2002; Ruiying & Allison, 2003) share significant functions of the discussion section in an RA (Report Findings, Refer to Literature, and Provide an Explanation).

Table 6 Moves and Steps Model by Yang and Allison (2003)

Moves	Description	Steps
Move 1	Background Information	
Move 2	Report Results	
Move 3	Summarise Results	
Move 4	Comment on Results	Step 1: Interpret findings Step 2: Compare findings with the literature Step 3: Accounting for results Step 4: Evaluate findings
Move 5	Summarise the research	
Move 6	Evaluate the research	Step 1: Indicate limitations Step 2: Indicate importance/advantage Step 3: Evaluate method
Move 7	Deductions from the research	Step 1: Make suggestions Step 2: Recommend future studies Step 3: Draw pedagogic Implication

All the frameworks that had been mentioned in this section share some strengths and weaknesses. For example, some of the proposed frameworks (i.e., Holmes, 1997; Peacock, 2002) attempted to provide a practical model in writing the discussion section in RAs across various disciplines in the field of sciences (e.g., biology, sociology, chemistry, history). In addition, the models introduced by Yang and Allison (2003), as well as Nowgu (1997), have included not only moves but also a detailed segment to the moves, known as sub-moves (steps). The inclusion of steps would more likely help RAs writers to understand the functions of the discussion section better. On the other hand, although the reviewed models share some similarities in the purpose of the moves (e.g., Stating the Results, Explaining the Results, Referring to Literature), several aspects from the moves would distinguish a framework from another. For example, while the move on Limitation was found in some models (e.g., Dudley-Evans, 1994; Peacock, 2002), this move was absent in others (e.g., Holmes, 1997, Swales, 1990). This difference could be caused by the variations of communicative purpose across disciplines (Peacock, 2002). For example, move on Draw Pedagogic Implication was found in the discussion section of applied linguistics RAs (Yang and Allison, 2003) but not of physics and biology RAs (Peacock, 2002). The following section further reviewed and discussed recent studies that have been done to examine the rhetorical structure of RAs discussion section with regards to the matter of disciplinary variation.

3.2 Recent Studies on RAs Discussion Section

A considerable effort was made recently to examine the rhetorical moves of RAs discussion section. Many studies have investigated the structure and organisation of this section. Several studies have focused on analysing the discussion section through the rhetorical structure and the linguistic realisations that contribute to the use of the moves in this section. On the other hand, there are also

studies that analysed the disciplinary variation on the structure of these written moves in the discussion section of RAs (e.g., Al-Shujairi *et al.*, 2019; Amnuai, 2017; Basturkmen, 2012; Dobakhti, 2016; Dujsik, 2013.; Hashemi & Moghaddam, 2016; Liu & Buckingham, 2018; Sadeghi & Alinasab, 2020), with some studies examined the variation in different types of published RAs (e.g., Arsyad *et al.*, 2020; Amnuai & Wannaruk, 2012; Jalilifar *et al.*, 2012; Jin, 2018; Sabet & Kazempouri, 2015; Sayfour, 2009).

3.2.1 *Disciplinary Variation of RAs Discussion Section*

Regarding the disciplinary variation, Nodoushan (2012) analysed the rhetorical moves in the discussion of 46 RAs in the field of applied linguistics based on Ruiying and Allison's (2003) framework through the use of the AntMover software. Findings from the study showed that moves on Stating Results, Commenting on Results and Deductions from Research were obligatory moves in the discussion section at 100% occurrences. This finding indicated that research writers from this field of study considered stating the results, interpreting the results, as well as providing implications and further recommendations as central components in the discussion. Basturkmen (2012) examined the rhetorical moves in the discussion of dentistry RAs, which was an in-depth analysis that involved not only moves but also steps and sub-steps. The study adopted a framework proposed by Basturkmen (Basturkmen, 2009) based on RAs from the field of applied linguistics. Results yielded that the discussion section of RAs in the field of dentistry generally had a similar rhetorical organisation to that of applied linguistics. However, slightly different steps were employed in more recent studies, which suggested that differences emerged at the steps and sub-steps level of analysis instead of at the moves'. These results further established that move level analysis might not be suitable to be employed across disciplinary variations within the genre of RAs.

In another study which targeted RAs from the field of applied linguistics, Dujsik (2013) examined 50 discussions using Peacock's (2002) framework of rhetorical moves. The findings showed that the moves on Findings and Referring to Past Studies were obligatory moves in the discussion section with 100% occurrences. On the other hand, the other moves were found to be conventional except for the moves on Expected or Unexpected Outcome and Limitation, which were optional at less than 60% occurrences. A study on the field of applied linguistics by Nodoushan's (2012) had also considered the move on Findings to be one of the main aspects of the discussion section in RAs. However, both studies were different as the study by Dujsik (2013) had considered the move on Commenting on Results as a core aspect in a discussion, but Nodoushan (2012) had placed Referring to Past Studies as a significant move of a discussion.

In addition to these studies, Hashemi and Moghaddam (2016) analysed the corpus on the discussion section from 38 RAs in applied linguistics applying mixed-method design. The findings introduced a five-move model that consists of several steps in each move. The five moves in the model are Study, Results, Discussion, Evaluation, and Suggestion. Similar to Nodoushan's (2012) study, Results and Discussion were the most commonly employed moves in the discussion section and were reported as obligatory. The move on Evaluation, which consists of several steps, which were Limitations, Delimitations, and Generalisability, was seen as the only optional move in the discussion

section. The study also reported that the rhetorical moves of the discussion section of RAs that were employed using mixed-method were slightly different from either quantitative or qualitative RAs.

On the other hand, Dobakhti (2016) analysed the discussion section within the same discipline (applied linguistics) from 15 qualitative RAs based on Swales's (1990) framework. Results from the study showed that the moves on Stating Findings and Commenting on Findings were the most frequent moves used in qualitative studies. These results were similar to a more recent study by Liu and Buckingham (2018), who also found these two moves to be the most common in the discussion section of RAs within the field of applied linguistics. However, Dobakhti (2016) found that the move on Stating Limitations had the least occurrence. By comparing this result with Hashemi and Moghaddam (2016), there were almost no differences in the discussion structure of mixed-method RAs and qualitative RAs. In contrast, the results from the aforementioned studies shared more similarities than differences, with both Stating Results and Comment on Results being the central components of the discussion section in RAs from the applied linguistics discipline.

Based on past studies on other disciplines, Moyetta (2016) examined a corpus of 20 RAs from prestigious journals within the field of psychology. Results had shown that Providing Background Information, Stating Results, Referring to Previous Research and Providing Explanations were obligatory moves. Most of these findings were similar to the results from applied linguistics discipline (e.g., Dobakhti, 2016; Dujcik, 2013; Hashemi & Moghaddam, 2016). However, unlike past studies, Providing Background Information was viewed as a central component in the discussion section within the psychology discipline (Moyetta, 2016).

Amnuai (2017) analysed the discussion section from 20 RAs in the field of accounting. The rhetorical structure of the discussion section was examined using Ruiying and Allison's (2003) model of moves. Results described that Report the Findings and Comment on the Findings were obligatory, which were similar to previous studies that investigated RAs from other disciplines, such as dentistry (Basturkmen, 2012) and applied linguistics (Dobakhti, 2016). Also, the findings showed that the most frequent step was Compare Results with Past Studies, which was within the move on Comment on the Findings. This step was treated as a move in previous work and was found to be highly frequent in the discussion section. In examining hard science discipline, Jin (2018) analysed 40 discussion sections from RAs in the field of chemical engineering based on Swales's (1990) model. The findings showed that Stating the Results and Commenting on Results were the most frequent moves in the discussion section of chemical engineering RAs while Limitations and Recommendations were the least frequent moves.

In a study by Liu and Buckingham (2018) that examined the discussion section of 20 RAs within the field of applied linguistics, similar findings with the studies previously mentioned were found. The study, which was similar to that by Amnuai (2017) in using Ruiying and Allison's (2003) model, results showed that Stating Results and Commenting on Results were the most frequent moves in the discussion section. These moves were necessary among research writers in the field of applied linguistics, as well as in other disciplines, such as accounting (Amnuai, 2017), dentistry (Basturkmen, 2012), law (Tessuto, 2015), psychology (Moyetta, 2016) and chemical engineering (Jin, 2018). Hence, research writers were expected to state the findings and comments in the discussion section regardless of the discipline or area of research interest.

The aforementioned studies have a great contribution to the literature. In this, the rhetorical structure of the discussion section was deeply examined in various disciplines. However, none of them compared the discussion section of two distinct disciplines and looked at the similarities and differences that might be found. How authors from different field start, construct, organize and end the discussion section of a research article. Not until the study conducted by Al-Shujairi *et al.* (2019) who compared medical sciences and applied linguistics RAs with regards to the organization of the discussion section. Their corpus included eight RAs from each field of study. A revised framework based on Peacock's (2002) framework was the main outcome of Al-Shujairi *et al.* (2019). A major difference was that move on Concluding Information was obligatory in medical science but optional in applied linguistics. Move on Explanation was found obligatory in applied linguistics and conventional in medical science. Concerning the similarities, both move on Expected or Unexpected Outcome and move on Reference to Previous Research were conventional in both disciplines. Also, move on Implication and move on Summary of Results were found to be optional.

3.2.2 Variation of the Discussion across Types of Journals

Not only could the discussion moves of RAs vary across disciplines, but different types of RAs published in different types of journals may also have some similarities and differences. Sayfour (2009) investigated the rhetorical moves of a discussion section in 32 ISI and non-ISI indexed RAs based on Nwogu's (1997) three-move model. The study found that similar frequencies were reported in the employment of moves and sub-moves in ISI and non-ISI RAs. In another research, Jalilifar *et al.* (2012) compared the rhetorical moves in the discussion section from 40 local Iranian and internationally indexed RAs within the field of applied linguistics. Through the use of Dudley-Evans's (1994) framework of rhetorical moves, findings from the study described Information and Claim as obligatory moves at 100% occurrences in both Iranian local and international RAs. In general, more similarities than differences were observed in both corpora with regards to the employment of moves. This result was similar to the findings of Sayfour (2009), except the move on Referring to Past Studies, which was more frequent in international RAs (Jalilifar *et al.*, 2012). This result suggested that research writers who published in local journals do not frequently compare the results of their studies with previous ones in their discussion section. Although Referring to Past Studies was one of the core components in a discussion section, research writers employed this move mostly to support an argument.

Similarly, Amnuai and Wannaruk (2012) compared two types of RAs within the same discipline between international and local Thai journals. The corpus consisted of 60 RAs which were constructed equally from the two types of journals. Ruiying and Allison's (2003) framework was used for identification of the moves and steps in the discussion section, whereby similarities were found at the level of move analysis while differences were found at the level of step analysis. High-frequency occurrences of Report Findings and Comment on Findings moves were found in both corpora. This result supported many previous studies (e.g., Amnuai, 2017; Dobakhti, 2016; Jin, 2018). Based on the analysis at the step level, Thai RAs showed high employment of Make Suggestions and Draw Pedagogic Implication steps in the move on Deductions compared to international RAs. Besides, in

contrast with the previous research by Sayfour (2009), the former found move on Information an optional move with less than 60% occurrences.

Similar to the study by Jalilifar *et al.* (2012), Sabet and Kazempouri (2015) compared the discussion section of international and Iranian ESP RAs through a corpus of 60 discussions that were analysed based on Kanoksilapatham's (2007) model of rhetorical moves. Overall findings showed more similarities than differences in the employment of moves and steps in the discussion section of both types of journals. Steps on State Findings and Referring to Past Studies from Move 2 were the most frequent to occur in both corpora. Moreover, a frequency of the step on Making Claim from move 2 was calculated and found to support the study by Jalilifar *et al.* (2012). Thus, the study concluded that there were no differences in the rhetorical move of the discussion section in RAs published in local Iranian and international journals. Also, the research writers in both journals emphasised several aspects such as stating results and making claim in the discussion section of the RAs, which further highlighted that the move on Stating Results was a core aspect of the discussion section. However, the move on Making Claim has not been commonly reported in past studies, which had been a uniquely significant finding in both types of journals.

In a distinctive study by Jin (2018), the rhetorical structure of the discussion section in low and high impact chemical engineering RAs were compared. The impact factor (IF) of the selected RAs was based on ISI (WoS) that were manually analysed using Swales's (1990) model. The results revealed similarities between high and low IF RAs within the discussion section for all moves except for one. The move on Commenting on Results occurred 95% in the discussion section of high impact RAs but only 75% in low impact RAs. This result indicated that research writers of low impact RAs had minimal attention in explaining research findings. These research writers should be aware that Commenting on Results is the primary function of the discussion section, whereby ignoring this move may affect the impact and readability of a research article as explaining research results is a crucial element in every published RA. Very recently, Arsyad *et al.* (2020) had examined the discussion section of 50 RAs from various disciplines published in Indonesian and international journals. Results showed that similar to the international RAs, Indonesian RAs in multi-disciplines considered the core moves on Statement of Results, Reference to Previous Research, Explanation, and Exemplification to be either conventional or obligatory. The difference between the two types of journals was not in the employment of the moves but the frequency of the occurrences.

Although the discussion structure between the two types of RAs in previous studies was extensively compared, none was focused on investigating one type of RA. The aforementioned studies included comparisons between ISI vs non-ISI RAs, international vs local RAs and high vs low impact RAs, with more similarities than differences found on the rhetorical moves of the discussion section (Jalilifar *et al.*, 2012; Jin, 2018; Sayfour, 2009). The similarities in findings indicate that RAs published in local journals could be as valid as those of international journals. Moreover, being non-ISI indexed journals did not make these journals less valuable than ISI indexed journals in writing the main components of the discussion section. However, a noticeable difference was found in the discussion section between high impact and low impact RAs (Jin, 2018). Hence, an investigation of more distinct types of RAs and journals would be needed.

4.0 IMPLICATIONS

The current review paper suggests various pedagogical implications for the teaching-learning of English for Academic Purposes (EAP). EAP instructors can further educate themselves by discovering in details the various functions of RAs discussion section. They may familiarize themselves with the rhetorical structure of the discussion section in different disciplines. In addition, the reviewed move models can be used as materials in EAP teaching. In this, several move models may be presented to help students understand how findings of different disciplines should be discussed. More importantly, the present paper is an important asset for students, especially graduate students, novice writers, and non-native English writers. Their research writing can be significantly improved by taking the various reviewed models and studies as a guideline when they discuss research findings. The comparison between RAs published in different types of journals would enlighten postgraduates and novice writers of the preferred structure of the discussion section published in high impact factor journals.

5.0 CONCLUSION

This review paper discussed the changes in the structure of published RAs discussion section over the last 36 years. The findings from the review showed that despite the changes in the rhetorical moves of the discussion section over time, some rhetorical moves such as Referring to the Literature and Explaining the Results are crucial and basic components of the discussion section. Moreover, variations in writing the discussion section are not only occurring across disciplines (e.g., soft and hard sciences) but also across types of journals (e.g., ISI and local Journals). In addition to the latest conducted studies that examined the RAs discussion, This section still receives “scant attention” (Kurniawan & Lubis, 2020, p. 137). The current review is limited to only the discussion section of a RA, further studies could look at other sections of a RA such as introduction and conclusion or compare between the discussion section of RAs written by native and non-native writers or the discussion section of quantitative and qualitative research articles.

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