

## **Understanding Structural Moves in Scientific Articles**

Indonesia has enforced a policy to push Indonesian academics to publish their research papers in reputable international journals to elevate Indonesia's publication quality. As a result, the number of published research articles has increased significantly. International journal articles generally follow a common structure consisting of several sections: title, abstract, introduction, literature review, methodology, findings and discussion, and a conclusion part. Each component serves a specific purpose in explaining the research as a whole. However, many Indonesian researchers still face challenges in meeting these standards. One major difficulty is their limited knowledge of English academic discourse and disciplinary conventions (Kurniawan et al., 2019). Therefore, in order to be able to write articles effectively, authors need to understand structural moves, the rhetorical steps that organize each section of a research article. Mastering these moves not only helps writers present their research clearly and persuasively but also ensures that their work aligns with international publishing standards.

To address these challenges, it is essential to examine how academic texts are organized through rhetorical move analysis. This approach, widely used in genre studies, helps explain the communicative purposes of different sections and the steps that realize them (Swales, 1990, 2004). Move analysis has been shown to be a valuable tool for novice researchers in understanding disciplinary conventions and aligning their work with international academic standards (Kanoksilapatham, 2007; Pho, 2008a; Pratiwi & Kurniawan, 2021).

Before looking at real examples of scientific articles, students first need to understand what structural moves are. A move is a step a writer takes to achieve a certain purpose in a text (Swales, 2004). Knowing this helps students see common patterns in research articles and improve their own writing to meet academic standards. Most papers use the IMRaD format—Introduction, Method, Results, and Discussion—where each section has its own moves. The next section will explain these parts and their typical moves in detail.

## 1. Abstract

Abstract may become the first thing that a reader or examiner will read before making a decision on the value of the whole research paper. Hartley and Betts (2009) emphasize the importance of abstracts which may increase the possibility of being read if they provide more information about the article. Similarly, Al-Shujairi et al. (2016) note that reviewers pay particular attention to the abstract, focusing on both its rhetorical structure and the language used. However, different rules and demands required by journals and book publishers make it challenging to produce well-qualified RA abstracts even for experienced scholars. (Friginal & Mustafa, 2017). Rhetorically, an abstract can consist of up to 5 moves: Move 1, introducing the research; Move 2, stating the purpose of the study; Move 3, explaining the methodology; Move 4, reporting the results and discussion; and Move 5, emphasizing the applications, broader implications, or the overall significance of the paper. A summary of this model is presented in Table 1 below.

Table 1. Move Analysis Model for Abstract  
(Hakim et al., 2021; Hyland, 2007; Swales & Feak, 2009)

No	Move	Function
1	Introduction	Establishes context of the paper and motivates the research.
2	Purpose	Indicates purpose, thesis or hypothesis, outlines the intention behind the paper.
3	Method	Provides information on design, procedures, assumptions, approach, data, etc.
4	Product	States main findings or results, the argument, or what was accomplished.
5	Conclusion	Interprets or extends results beyond scope of paper, draws inferences, points to applications or wider implications.

## 2. Introduction

The introduction, even though it is usually the shortest part of a research article, is very important because it decides whether readers will continue reading or not (Grant & Pollack, 2011). This section, which is usually about 5–7 paragraphs or the first few pages,

shows the novelty of the study and explains how it is different from other research (Ahlstrom, 2017). Writing a good introduction is therefore very important, but it is also difficult for both new and experienced writers. To address this issue, Swales developed the Create a Research Space (CARS) model, first introduced in 1981, revised in 1990, and refined in 2004, with the 1990 version being the most widely applied and regarded as the most suitable for analyzing research article introductions. The CARS model outlines three key moves, each consisting of specific steps, that serve as a framework for structuring an effective introduction. In order to facilitate analysis, Swales also provides detailed descriptions of the structure and function of these moves, along with linguistic examples that typically characterize each step:

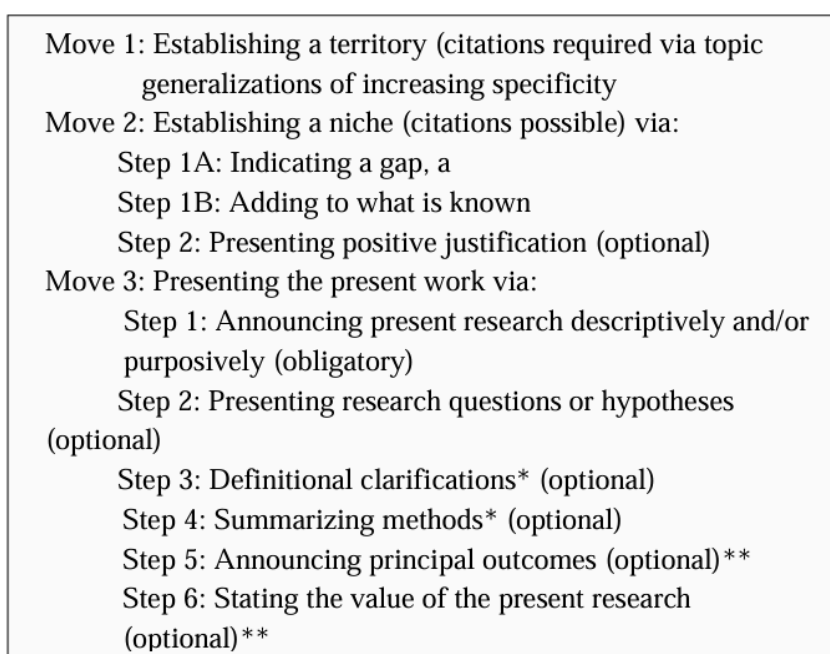


Figure 1. Swales' (2004, p. 230, 232) create a research space model

Swales' CARS model has three move structures which consist of several stages. Each move and step present the communicative function. In this model, Swales also proposes lexical and syntactical signals used to indicate the moves and steps. The lexical signals focus on specific words to signalize the move and step structures. Therefore, the syntactical signals indicate the sentence patterns of move and step structures. The framework and lexical and syntactical signal of each move and step are described below. 1.

### **Move 1: Establishing a territory**

In this stage, the researchers need to claim a certain point that will be discussed in the research and review arguments of previous research (Swales & Feak, 2012).

#### a. Step 1: Claiming centrality

The author asks the discourse community (the audience for the paper) to accept that the research about to be reported is important, central, problematic, or relevant in some way.

Linguistic signals:

- 1) Recently, there has been growing interest in ...
- 2) The study of .....has become an important aspect of ...
- 3) ... has become a major issue ...
- 4) ... remains a serious problem ...
- 5) Knowledge of ..... has a great importance for....
- 6) Many investigators have recently turned to....
- 7) The relationship between..... has been studied by many authors

### **Move 2: Establishing a niche**

The author argues that there is an open “niche” in the existing research, a space that needs to be filled through additional research

#### a) Step 1A: Indicating a gap

The author demonstrates that earlier research does not sufficiently address all existing questions or problems.

Linguistic signals:

- 1) Although extensive research has been carried out on X, no single study exists which.....
- 2) However, these results were based upon data from over 30 years ago and it is unclear if .....
- 3) Little is known about X and it is not clear what factors...
- 4) To date, only a limited number of Xs have been identified....

#### b) Step 1B: Adding to what is known

This step emphasizes the gap in the existing territory.

Example:

- 1) Hence, given the highly specific EAP contexts under study, more in-depth qualitative studies are required to explore teachers' voices and probe the cognitions and beliefs behind their reading comprehension policies and practices
- 2) Hence, in light of the importance of MI theory, course materials should be used in a way that encompasses all the eight intelligences in the classrooms
- c) Step 3: presenting positive justification  
It is marked by personal comment from the writers that this area is worthwhile and contributes to the improvement.

Linguistic signals:

- 1) One reason to take such an approach is that...
- 2) Another reason for determining the complete repertoire of chemical signals used for any particular communicative function is that ...

### **Move 3: Occupying the niche**

In this move, the researcher introduces the present study in the context of the previous study drawn in Moves 1 and 2 (Swales & Feak, 2012).

- a) Step 1: Announcing present research

This step involves introducing the current research and aims to clearly state what research is about and why it is being conducted

- 1) The aim of the present paper is to give ...
- 2) The main purpose of the experiment reported here was to ...
- 3) This study was designed to evaluate...
- 4) We now report the interaction of...

- b) Step 2: Presenting Research questions or hypotheses

In this step, the research questions or hypotheses are explicitly stated. This provides a clear direction for what the research aims to address or test.

Examples"

- 1) This study seeks to answer the following research questions: How does social media usage affect self-esteem in adolescents?
- 2) We hypothesize that remote work positively influences employee productivity.
- c) Step 3: Definitional clarifications

This step involves defining key terms or concepts that are central to the research. Clarifying definitions helps ensure that readers understand precisely what is being studied.

For example:

- 1) For the purposes of this study, “remote work” is defined as any work performed outside of the traditional office environment.
  - 2) In this context, ‘mental health’ refers to emotional, psychological, and social well-being.
- d) Step 4: Summarizing methods

This gives readers an overview of how the research was conducted

Examples:

- 1) Data were collected through a mixed methods approach, including surveys and in-depth interviews
  - 2) The study utilized a longitudinal design, following participants over period of six months.
- e) Step 5: Announcing principal outcomes

This step involves presenting the main findings or results of the research. It gives readers an idea of the key outcomes without going into extensive detail.

Examples:

- 1) The study found that high social media usage is associated with lower self-esteem among adolescents.
  - 2) Results indicates that remote work significantly increases employee productivity.
- f) Step 6: Stating the value of the present research

In this step, the significance or value of the research is stated. This explains why the research is important and what contributions it makes to the field.

Examples:

- 1) This research contributes to our understanding of the psychological impacts of social media on youth.
  - 2) The findings provide valuable insights for organizations considering the implementation of remote work policies.
- g) Step 7: Outlining the structure of the paper
- This step involves providing an overview of the organization of the paper. It helps readers know what to expect in the subsequent sections of the document.

Examples:

- 1) The paper is organized as follows: Section 1 reviews the literature, Section 2 describes the methodology, Section 3 presents the results, and Section 4 discusses the findings and implications.
- 2) Following the introduction, the paper will detail the rhetorical frameworks, research design, results, and conclude with a discussion and future research directions.

### **Citation in Research Articles**

Arsyad (2003) found that citations in Indonesian RAs are present throughout the introduction section of the RAs, even from the very beginning of the section. In addition, according to Yeh (2010), although citations are often used in all sections of a journal paper, they tend to be used more frequently in the introduction of the text. Arsyad (2003) also suggests that citations are used for several different communicative purposes. First, they are used to prepare readers' background information or knowledge, such as definition of key terms, a description of the history of research topics and government policy. This introduces the field of research in order to put it into the context of the specific research topic. The second purpose of citation is to support the importance of the research topic by demonstrating that the problem raised in the study actually exists; this is done by using facts and statistics quoted from literature sources. The last purpose of citation in the Indonesian RAs was to implicitly show readers that the authors are already familiar with the research topic; this is done by referring to the work of others relevant to the topic of the study. By so doing, the authors tell readers that they follow the latest developments on the topic of their research.

### 3. Method

Unlike the introduction, which follows Swales' CARS model (1990, 2004), the methods section does not have one fixed framework. However, studies show that certain rhetorical units, called *moves* or *steps*, commonly appear. The two most frequent are describing data collection procedures and describing data analysis procedures (ElMalik & Nesi, 2008; Li & Ge, 2009; Lim, 2006; Pho, 2008a; Tessuto, 2015). Other moves vary by discipline, such as describing experimental procedures (ElMalik & Nesi, 2008; Li & Ge, 2009), research site (Huang & He, 2011; Tessuto, 2015), samples (Lim, 2006; Pho, 2008a), instruments (Pho, 2008a), statistical methods (Kanoksilapatham, 2015; Tessuto, 2015), and ethical statements (Kanoksilapatham, 2015).

Given the wide variation in how the methods section is structured across disciplines, it is necessary to adopt a framework that is both relevant and comprehensive for education-related studies. For this reason, Pho's (2008a) model of the methods section of applied linguistics and educational technology research articles was chosen as the initial coding scheme (see Figure 1).

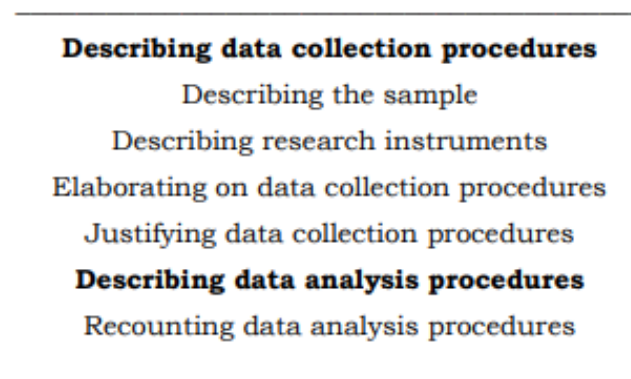


Figure 1: Pho's (2008a) Methods section model

Pho's (2008a) model was used as the starting point, but it did not cover all the purposes found in the data. Therefore, some new moves and steps were added, and the final coding scheme was developed, as shown in Table 2.

Table 2. Coding Scheme

<b>Code</b>	<b>Move</b>	<b>Definition</b>	<b>The example</b>
<b>RD</b>	<b>Describing research design</b>	Outlines the vital aspects of the research design	This research applied the descriptive method which attempted to describe the students' perception towards the use of weblog as teaching media in learning English subject.
<b>DC</b>	<b>Describing data collection procedures</b>		
DC1	Describing research context	Provides relevant background information as the general context for the research	The research took place in the context of higher education in Indonesia, specifically within an English Education Department at a mid-sized private university. The program emphasizes academic writing as part of its curriculum, making it a relevant site for investigating students' writing development.
DC2	Describing the sample	Describes in detail the sampling procedure and the major characteristics of the sample	The population of this research was the 5th graders in academic year 2015/2016 in one of Primary Islamic Bilingual School in West Java, Indonesia.
DC3	Describing instruments	Describes in detail the instruments, e.g., questionnaires,	To get the data, this study applied questionnaire and semi-structured interview. The

		interviews, or tests, for collecting data needed to measure the variables	questionnaire which consisted of 25 items and comprised of four options each, in the form of Likert Scale which started from strongly agree to strongly disagree.
DC4	Elaborating on data collection procedures	Narrates the procedures of applying the instruments to the participants	In this study, the researcher interviewed 20 students using semi-structured interview. They were given 8 questions toward the use of weblog-based learning in English subject.
DC5	Justifying data collection procedures	Establishes the appropriateness of the data collection procedures	Interview was used to gain the supporting data the researcher could not get through questionnaire. According to Heigham and Croker (2009) interview can provide important insight into respondents' experiences, beliefs, perceptions, preferences, and motivations.
DC6	Verifying compliance with ethical standards	Indicates that the research was designed and conducted in no way harmful to the participants	All participants were informed about the purpose of the study, and their consent was obtained before data collection. The research procedures followed institutional ethical guidelines

			to ensure no harm to the participants.
<b>DA</b>	<b>Describing data analysis procedures</b>		
DA1	Recounting data analysis procedure	Narrates the particulars of the analytical treatment of data	Data from the questionnaires were analyzed using descriptive statistics to calculate frequencies and percentages. In addition, the qualitative responses from interviews were transcribed, coded, and thematically analyzed to capture students' perceptions of academic writing challenges.
DA2	Justifying data analysis procedures	Establishes the appropriateness and rigor of the analytical procedures	An analytic writing rubric adapted from Jacobs et al. (1981) was applied to assess students' texts, as it offers reliable criteria for evaluating multiple aspects of writing.
DA3	Establishing inter-coder reliability	Explains how other coders were employed in data analysis for more accurate and reliable results	Two researchers separately coded the students' essays using the predetermined rubric. Any discrepancies in coding were resolved through discussion, and consensus was reached to ensure consistency in the scoring process.

#### 4. Findings and Discussion

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). This section is not only to report the study's findings but also to build arguments that might persuade the reader of the relevance of the results by emphasizing the connections and differences with past research (Amnuai, 2017; Basturkmen, 2009; Lim, 2010). There are four primary rhetorical moves in the finding and discussion section: (1) establishing background Information, (2) delivering findings, (3) summarizing results, and (4) commenting on outcomes. The finding and discussion section's standard norms entail particular abilities, such as the ability to effectively convey results and remark on or argue against them critically.

Yang and Allison (2003) developed a move-structure model to provide a clear framework for writing discussion sections. This model helps writers adjust their writing to the communicative purposes expected in this part of a research article. The framework was built from their earlier analysis of applied linguistics research articles and identifies seven rhetorical strategies commonly used in discussions. The rhetorical moves identified in the F&D sections can be described in Table 3 below.

Table 3. Moves and Steps Model by Yang and Allison (2003)

<b>Moves</b>	<b>Descriptions</b>	<b>Steps</b>
Move 1	Background information	
Move 2	Report Results	
Move 3	Summarise Results	
Move 4	Comment ofn 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: Indicatelimitations
		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

## 5. Conclusion

The conclusion section of a research article plays an important role in closing the discussion and reinforcing the study's contribution. Conclusions deal with summarizing the study by highlighting overall findings, evaluating the study, suggesting implications and applications of research, and suggesting possible lines for further research (Yang & Allison, 2003). Similarly, Swales and Feak (2004) argue that a conclusion is not merely a summary, but also a space to highlight the significance and relevance of the study.

Yang and Allison (2003) identify several rhetorical moves commonly found in conclusions, including summarizing key findings, stating contributions, acknowledging limitations, and offering implications or recommendations for future research. Similarly, Bunton (2005) emphasizes that the conclusion often reaffirms the importance of the study and connects it to the broader field. Therefore, the structural moves in the conclusion can be seen as a set of rhetorical steps that allow writers to close their articles in a clear, concise, and convincing way. Since there has not been a clear guideline of the research journal articles explicitly for the conclusion section, the following is adapted from Paltridge and Starfield (2019). This rhetorical move model is in their book about thesis and dissertation writing. Their framework helps writers structure the conclusion logically, ensuring that the key results are emphasized and linked to broader implications.

Table 4. Rhetorical Moves of Conclusion Sections (Paltridge & Starfield, 2019)

No	Rhetorical Moves
1	Summarizing the key findings
2	Answering the research aims
3	Implying findings
4	Acknowledging the limitation
5	Recommending or Suggesting for future research

In academic writing, each section of a research article generally follows a set of rhetorical moves that guide readers through the logic and flow of the study. These moves

are rhetorical or communicative steps that serve particular functions, such as introducing the topic, outlining objectives, describing methods, presenting results, and drawing conclusions. Scholars have developed various models to analyze and explain these patterns. For instance, Swales (1990, 2004) and Swales and Feak (2009) highlight how moves provide structure and coherence in research writing, while Lim (2006) and Peacock (2011) expand the discussion by identifying specific moves in abstracts, introductions, and methods sections. Understanding these models is important for students and researchers, as it helps them organize their writing in line with academic conventions and effectively communicate their findings. Table 5 below summarizes the structural moves and their functions in key sections of research articles based on these models.

Table 5. Models for research article sections (Lim, 2006; Peacock, 2011; Swales, 1990, 2004; Swales & Feak, 2009)

RA Sections	Structural Moves	Description of Their Functions
Abstract	Move 1: Introduction	Statements about the research topic or what do we know about the topic? Or why is the topic important?
	Move 2: Objectives/ purposes	Statements about the objective of the research or what is this study about?
	Move 3: Methods	Statement about how a study has been conducted or How was it done.
	Move 4: Results	Statement about what have been found in the research or what was discovered?
	Move 5: Conclusion	Statement about the conclusion, implication or recommendation of the research findings or what do the findings mean?
Introduction	Move 1: Establishing a territory	Statement about showing that the general research area is important, central, interesting, problematic, or relevant in some way or introducing and/or reviewing items of previous research in the area
	Move 2: Establishing a niche	Statement of indicating a gap in the previous research and/or extending previous knowledge in some way
	Move 3: Occupying the niche	Statement about presenting the present work by outlining the purpose, listing the research questions, announcing the principal findings, stating the value of the present research and indicating the structure of the research article
Methods	Move 1: Describing data collection procedure/s	Description of data collection techniques including: 1) description of location of the sample, the size of the sample/population, characteristic of the sample, sampling technique or criterion, 2) recounting steps in data collection, and 3) justifying the data collection procedures
	Move 2: Delineating procedurals for measuring variables	Description of research procedures including: 1) presenting an overview of the design, 2) explaining the method of variables, and 3) justifying the methods of measuring variables

	Move 3: Elucidating data analysis procedure/s	Description of the process of data analyses including: 1) statistical calculation for quantitative research, 2) justifying data analyses procedures, and 3) previewing results
Results & Discussion	Move 1: Background information about the research	Statement about 'theoretical and technical information' as already addressed earlier in the RA
	Move 2: Statement of results	Claim made by the writer as the direct answer to their research question
	Move 3: Statement of (un)expected findings	Statement or comment on whether or not the research results or findings are as they are expected
	Move 4: Reference to previous relevant studies	rhetorical attempt of writer/s to link the present research finding/s to the available relevant knowledge or information for the purpose of comparison or to support the present findings
	Move 5: Explanation of research results	Author's rhetorical attempt to logically convince readers why such unexpected or extraordinary results or findings of the present study occur
	Move 6: Illustration to support the research results	Illustration or samples to strengthen or support the explanation of research findings
	Move 7: Deduction and hypothesis or Interpretation of research findings	Author's claim about the interpretation of the research findings to a larger scope of topic or area
	Move 8: Suggestions or recommendation	Author's suggestion on the application or implementation of the research findings in practical ways and/or suggestion for further studies in the same or similar topic