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RHETORICAL STRUCTURE, CYCLICAL PATTERNS AND STANCE MARKERS IN FORESTRY RESEARCH ARTICLES

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By

ZAHRA NASIRIZADEH

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

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DEDICATION

To the soul of my Father, prayers of my Mother and my ocean-hearted brother,
Dr. Khosrow

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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September 2021

Chairperson : **Associate Professor Shamala a/p Paramasivam, PhD**
Faculty   : **Modern Languages and Communication**

There has been a surging interest in the study of genre-based analysis of the research article (RA) since three decades ago. Over these years, English for Academic Purposes (EAP) writing research has highlighted the intricacy and evolving nature of discursive practices by underlining writers' communicative goals and linguistic choices, in addition to the expectations of discourse community members. Some practitioners, typically novice writers, are unaware of the critical role that rhetorical structure and linguistic features serve in creating a research article (RA) acceptable to the respective discourse communities. Therefore, it seems essential to perform analysis at both macro (rhetorical structure) and micro levels (linguistic features) as it provides useful information crucial to prepare apt pedagogical materials for novice writers to compose comprehensive research articles. Genre descriptions of research articles vary in their focus from the selected sections to the whole article. Very limited studies have investigated the overall organisational structure of articles with all the main sections of Introductions-Methods-Results-Discussion (IMRD). The current study set out to a) analyse the rhetorical structure of IMRD sections of forestry research articles, b) analyse the cyclical move patterns recurring in each IMRD section and c) examine stance markers realised in each move in the respective sections. Mixed methods of quantitative and qualitative were applied in this study. A corpus of 40 research articles from 5 ISI journals was selected for this study. The selected articles were extracted from high impact factor journals in forestry. The corpus was analysed based on Kanoksilapatham's (2005) model as the analytical tool to explore the rhetorical structure and cyclical patterns of IMRD sections. As to the linguistic features, this thesis applied Hyland' (2005) interactional model of metadiscourse to study stance markers of moves in the overall IMRD sections. On the basis of results from the analysis of rhetorical structure of RAs, some new moves and steps were realised in each respective section, owing to the specilised nature of forestry discipline, as an applied hard science. In this regard, the highest number of new moves or steps was registered in Introductions, with the Results sections remaining unchanged. As to the cyclical patterns, the findings pointed to the pervasiveness of particular function-oriented cycles and sequences in each IMRD section. In Introductions, the

Move1-Move2 cycle, in Methods the Move 4-Move 5, in Results the Move 11-Move 12, and in Discussions the Move 13-Move 14 cycles were the most frequent cyclical patterns. Exploring stance markers, each move was found to be characterised with particular epistemological stance markers in cases attributable to the nature of forestry discipline and the communicative purpose of each move. Overall, hedging devices and self-mentions were found to be the most prototypical stance markers, with boosters and attitude markers as the least indexed ones in the corpus. To conclude, findings from the present study further testify to the integral role of RAs genre knowledge in EAP realm. Raising novice writers' awareness of the prototypical principles behind rhetorical structure and linguistic features of RAs in a specific discipline could be considered the main potential pedagogical benefit of genre analysis approach.

Keywords: research article, genre, IMRD structure, disciplinary discourse, rhetorical structure, cyclical pattern, stance markers

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

POLA KITARAN, STRUKTUR RETORIKAL DAN PENANDA STANS DALAM ARTIKEL PENYELIDIKAN PERHUTANAN

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Terdapat suatu lonjakan minat dalam kajian analisis berasaskan genre bagi artikel penyelidikan (RA) sejak tiga dekad yang lalu. Sejak tempoh tersebut, Bahasa Inggeris untuk Tujuan Akademik (EAP) bagi penulisan penyelidikan telah menyorot kerumitan dan sifat berkembangnya amalan diskursif melalui penekanan matlamat komunikatif penulis dan pilihan linguistik, di samping ekspektasi ahli komuniti wacana. Beberapa pengamal, penulis novis yang tipikal, tidak menyedari akan peranan kritikal bahawa struktur retorikal dan fitur linguistik yang digunakan dalam penyediaan artikel penyelidikan (RA) harus boleh diterima oleh komuniti wacana masing-masing. Oleh sebab itu, adalah perlu untuk melaksanakan analisis pada kedua-dua tahap makro (struktur retorikal) dan mikro (fitur linguistik) kerana ia memberikan informasi berguna yang penting bagi penyediaan bahan pedagogikal yang sesuai bagi penulis novis untuk mengarang artikel penyelidikan yang komprehensif. Deskripsi genre bagi artikel penyelidikan telah mempelbagaikan fokus mereka daripada seksyen pilihan kepada artikel keseluruhan. Kajian yang sangat terhad telah menyelidiki struktur organisasi keseluruhan artikel dengan semua seksyen utama, iaitu Pengenalan-Kaedah-Dapatan-Perbincangan (IMRD). Kajian ini bertujuan untuk a) menganalisis struktur retorikal seksyen IMRD bagi artikel penyelidikan Perhutanan dalam jurnal ISI, b) menganalisis pola kitaran yang berulang dalam setiap seksyen IMRD dan c) meneliti penanda stans yang dinyatakan dalam setiap gerakan dalam seksyen masing-masing. Kaedah campuran kuantitatif dan kualitatif telah diaplikasikan dalam kajian ini. Korpus sebanyak 40 artikel penyelidikan dari 5 jurnal ISI telah dipilih bagi kajian ini. Artikel terpilih telah diekstrak daripada jurnal faktor impak tinggi dalam Perhutanan. Korpus tersebut telah dianalisis berdasarkan model Kanoksilapatham (2005) sebagai alat analitikal bagi menerokai struktur retorikal dan pola kitaran bagi seksyen IMRD. Untuk fitur linguistik, tesis ini mengaplikasikan model interaksional Hyland (2005) metawacana bagi mengkaji penanda stans bagi gerakan dalam keseluruhan seksyen IMRD. Berdasarkan dapatan yang diperoleh daripada analisis struktur retorikal, beberapa gerakan dan langkah baharu telah dikesan dalam setiap masing-masing seksyen, akibat sifat khusus disiplin Perhutanan sebagai sains tulen gunaan. Dalam hal ini, bilangan gerakan atau langkah baharu tertinggi telah didaftarkan dalam seksyen Pengenalan, dengan seksyen Dapatan

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kekal tidak berubah. Bagi pola kitaran, dapatan menunjukkan kitaran dan sekuen berorientasikan fungsi tertentu yang keterlaluan dalam setiap seksyen IMRD. Dalam Pengenalan, kitaran Gerakan 1-Gerakan2, dalam Kaedah, Gerakan4-Gerakan 5, dalam Dapatan, Gerakan 11-Gerakan 12, dan dalam Perbincangan, kitaran Gerakan13-Gerakan14, merupakan pola kitaran yang paling prevalen. Penelitian pada penanda stans, setiap gerakan didapati dicirikan dengan penanda stans epistemologikal tertentu yang berpunca kepada sifat disiplin Perhutanan dan tujuan komunikatif setiap gerakan. Secara keseluruhan, peranti cantasan dan pernyataan kendiri didapati merupakan penanda stans paling prototipikal, dengan penggalak dan penanda sikap sebagai penanda terindeks paling kurang. Kesimpulannya, dapatan kajian ini selanjutnya membuktikan peranan asas pengetahuan genre RA dalam ranah EAP. Peningkatan kesedaran pelajar novis mengenai prinsip prototaip di sebalik struktur retorik dan fitur linguistik RA dalam disiplin yang spesifik, menunjukkan manfaat pedagogikal pendekatan analisis genre yang berpotensi.

Kata kunci: artikel penyelidikan, genre, struktur IMRD, wacana disiplinari, struktur retorikal, pola kitaran, penanda stans

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This Thesis was submitted to the Senate of University Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the supervisory committee were as follows:

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Declaration by graduate student

I hereby confirm that:
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LIST OF ABBEREVIATIONS

CARS	Create A Research Space
EAP	English for Academic Purposes
ESL	English for Specific Purposes
ESP	English for Specific Purposes
IMRD	Introduction, Methods. Results, Discussions
ISI	Institute for Scientific Information
JCR	Journal Citation Report
KWIC	Key Word in Context
MS	Move Step
NNS	Non-Native Speaker
RA	Research Article
SPRE	Situation -Problem - Response - Evaluation
WAC	Writing Across the Curriculum

CHAPTER 1

INTRODUCTION

1.1   Overview

This chapter presents an account of a background to the study, statement of the problem, scope of the study, research questions, objectives of the study, significance of the study, theoretical framework, conceptual framework, and definition of key terms. Finally, a summary of the present chapter is also included at the end of this section.

1.2   Background of the Study

Written language has had and still has a fundamental role in diffusion of knowledge, enjoying a high academic standing in fairly all societies. It is appreciated by the common public with respect, gratitude and reverence. There is no doubt that advances in technology have played a fundamental role in the growing significance of writing in education in the 19th century. The development of inexpensive and durable paper, mechanical pen, attached eraser, and typewriter, for example, all helped to emphsise on a classroom, providing teachers with the opportunity to comment on the writings of their students. Writing has also been essential to the continuing development of contemporary sciences and scholarship. Whereas medieval doctoral applicants required to defend their thesis orally in public against anyone who is willing to argue, contemporary scholars released their results. Hugh Blair's lectures on 'Rhetoric' had surprising editions between 1783 and 1911, suggesting that learners would enhance their writing most efficiently by reading outstanding writing, while at the same time reiterating on the significance of developing good habits in learners (cited in Lynn, 2010). The traditional appreciation of writing and literacy was definitely a fundamental appreciation of those who could use written language properly (Linell, 2005: 30).

The importance of disciplinary variation in the rhetorical construction of academic texts has been acknowledged since the early days of rhetorical discourse analysis, with research article (RA) genre as the main text genre serving to disseminate disciplinary knowledge (Peacock, 2002). Given the strong influence of Swales' work (e.g., 1990, 2004), ESP genre analysis studies of research genres in general and of RAs in particular, have projected a connection between genre analysis and its pedagogical needs and applications. Indeed, elaborating on the rhetorical structure and recurrent cyclical patterns of RA moves or steps in different discourse communities or disciplines can serve as a means to illustrate the projected genre-centreed approach for pedagogical purposes. Although authors may have sufficient abilities in general English, a lack of rhetorical ability to interact consistently in the form expert community members conduct, is likely to result in problems in research article writing. Conceiving methodically, Linell (2005) proposes that written language is disciplined and structured, its conventions deemphsise many types of variation, in contrast to spoken version of language. Written texts are found to have culturally prioritised forms defined by their respective discourse

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communities that structure their general organisation and impact their internal form. These structuring forces, are not haphazard at both the general and local levels; instead, they exist to provide guidance for readers and writers alike (Bazerman, 2008).

A central predisposition behind the genre-based approach to text analysis is the conception that written genres can be constitutionalized via exploration of their linguistic features (Hyland, 2007) and rhetorical structures (Kanoksilapatham, 2005) that function to fulfil particular communicative goals in the individual discourse communities (Hyland, 2007; Kanoksilapatham, 2005).The variable deployment of rhetorical and linguistic features in academic writing genres across disciplinary contexts, has been a long-standing focus of genre-based writing research in the English for Academic and Specific Purposes (EAP and ESP) tradition (Moreno & Swales, 2018). Turning to linguistic features, as to the accelerated evolvement of appraisal mechanisms universally, academicians now find themselves faced with the challenge of publishing in prestigious English language journals (Hyland, 2020). These demands pose challenges to academics, irrespective of first language, as the potential to project themselves authoritatively via the dual lens of rhetorical structure and linguistic features which is believed to be mainly acquired through experience (Hyland 2015, 2016; Swales, 2004). Stance markers are proved to be a main criterion to gauge the linguistic density of a piece of research. Stance markers are broadly regarded as writers' rhetorically projected attitude to the propositions in a text (Berman & Ravid, 2009; Hyland, 2012: 134). However, stance principles are not always entirely perceived by learners, and they may entail explicit attention and practice (Hyland, 2012). Stance research commonly peruses how writers overtly control certainty of their claims. Epistemic stance markers like *possibly* that calibrate writers' commitment or certainty are typically termed hedges, and are believed to be common in advanced academic writing across various fields (Adel, 2006; Hyland, 2005; Hyland & Tse, 2004; Li & Wharton, 2012). Hedges express "tentative possibility" and potentially prompt "greater precision", and they are reported to have been increased diachronically in both hard and soft science research articles (Hyland & Jiang, 2018). Advanced academic writing, regardless of discipline, tends to host more hedging or qualifying-calibration features than *boosters* or *amplifiers* (e.g., certainly, definitely) (Hyland, 2005).

Research papers have been broadly studied over the past three centuries using genre-based methods. The tendency towards genre analysis of RAs is driven by the fact that they are regarded as a significant channel of scientific or scholarly communication. In other words, the research article a key genre applied by disciplinary tribes as a medium for disseminating and ratifying information in various fields. Nevertheless, writing RAs is known to be engaging for native and non-native writers identically, as it necessitates a substantial level of exposure to the current research articles in a specific field, and advanced writing proficiency for expressing ideas in ways acceptable to their discourse community members (Kanoksilapatham, 2005). Publications are the most important measures through which researchers are evaluated. It follows that professional progress and visibility depend not only on the content of research, but also on the researcher's ability to mould the content into the rhetorical structure and deploy linguistic standards set by journals (Joseph & Lim, 2018).

Writing research articles in English, therefore, is a critical skill to be imparted to all aspiring members of various disciplinary communities (Hyland, 2006; Kanoksilapatham, 2015). To accommodate the needs concerned, programs in English for Research Purposes (ERP) at tertiary level are now more focused on research articles, given that the acculturation of students to this exemplar of scientific discourse constitutes a main factor that impacts their academic success (Huang, 2017). A genre-based knowledge of RAs in a specific discipline can assist learners to become more aware of writing conventions that allow them to create texts that are well-formed in terms of both rhetorical structure and language decisions. By offering an elaborate knowledge of RAs' rhetorical structure and linguistic features, it is guaranteed to a large extent that learners have access to solid forms of language in the academic sphere.

Ken Hyland, reiterates his argument concerning the 'myth' of disadvantage in publication process posed to those non-native English writers. Nevertheless, while acknowledging the extensive challenges to gain acceptance for publication in prestigious journals, he concedes that such challenges do not merely pertain to Non-Native English speakers and configuring these problems in this manner hegemonises a biased view of second language writers and a "demoralising discourse of disadvantage" (Habibi & Hyland, 2019: 5). Habibi asserts that in the case of scholarly publication, the grass is not unquestionably greener on the other side of the fence, and the sword of 'Damoclesis' hangs over the heads of academics globally regardless of their native language or nationality (ibid: 40). Following Swales (2004), however, writing research articles is particularly demanding for non-native writers who are required to write in English (Ren & Li, 2011).

The ESP approach to genre analysis aims to clarify the link between the writer's communicative strategies and the textual realisation of a genre to novice writers (Bawarshi & Reiff, 2010). Tribble (2017) channels the discussion into the EAP realm and reprises the support practitioners can offer to novice writers. Aggregating recent research literature, he questions the notion of nativeness and argues that genre informed instructions grounded in apprentice vs. expert dichotomy offer a more practical basis for assisting novice writers. With this pressing need among academics to develop their English rhetoric competence to continue in written communication, many movements in English for Academic Purpose (EAP) have emerged in the academy. Such an enhancement in EAP may have been mainly driven by the Movement called Writing Across the Curriculum (WAC) in North America (Faiz, 1998). Genre-based studies have a wide application to examine English academic writing texts, especially research articles, with a recent attention to their rhetorical move structures and linguistic characteristics.

1.2.1 The Notion of Genre

Genre analysis has received increasing attention from several diverse domains. Genre is a vague notion, a term of art somewhat loose. In the United States, genre analysis has become connected with a formulaic manner of creating specific texts. Genre is a notion in which texts are grouped together, reflecting how authors usually use language in recurring circumstances (Swales, 1990).

Genre is defined as a class of communicative events sharing some set of communicative purposes (Swales, 1990). The discourse community professional members understand these purposes and thus form the rationale for the genre. Tribble (1996) claims that Swales' use of the terms 'specialist' and 'parent discourse community' raises the question of conventional principles and to what extent they can be challenged. This can be an issue for educators who regard individual writers as the originators of texts. He also asserts that it would be unprofessional to assume that texts can be written in a single rigorous recipe. Tribble raises the argument on the reasons behind changes in a genre, proposing that once learners become a member of the parent discourse community, they often feel a need to challenge the authority of both their seniors and peers and to reinterpret a tradition. He further claims that by meticulously studying examples of the parent genre as the main source, writers can become professional members of the discourse community. He adds that genre is not a rigid set of rules for creating texts, rather it is a social practice and it is not merely the text that makes the genre possible.

Holmes (1997) also described genre as a class of texts characterised by a particular feature of communicative goal which tends to create unique structural patterns. According to Hyon (2017), genre is recognizable as a type or category because there are similarities in intent, content, shape and/or context between different cases of a genre. In other words, genres can be considered as a category of texts defined by similarities and, to some extent, differences across their members. Following Hyland (2005), members of a community usually have little complications recognizing similarities in the texts they typically use and drawing on their repeated experiences of reading, understanding and most likely creating such texts relatively readily. This is partly because writing is a practice based on expectations. In other words, if the writer takes the endeavor to anticipate what the readers might expect, the readers' chances of interpreting the objective of the writer will raise. From this standpoint, writing a text cold be regarded to be mainly based on the text addressees, producing a text that meets the expectations of the respective readers.

Genre theorists regard the relationship between members as pivotal to language use, asserting that each accomplished text expresses the writer's consciousness of its context and the readers who form part of the context (Hyland, 2005). While different scholars place varying levels of emphasis on the texts and social contexts they represent or generate (Johns, 2002; Hyland, 2004), it appears that they unanimously admit that writing is dialogic (Bakhtin, 1986). This is both because texts presuppose an active audience and because they are linked to other documents.

In Bhatia's (1998) words, genre functions as a game which has particular rules and conventions of its own. Both writers and readers act as professional players in such a match. They win the game by manipulating and exploiting the game's laws but not strictly adhering to them. Both Swales (1990) and Bhatia (1998) see genre from a socio-cognitive angle as a social, vibrant and interactive concept. The essence of the notion of genre, as it is now used in applied linguistics, ESP and rhetoric, emphsises the primacy of communicative intent and how it shapes or impacts both surface and deeper rhetorical constructions. Some theorists have described genres in terms of 'family resemblances' among texts (a notion derived from the philosopher Wittgenstein) (Swales, 1990: 49). The 'family resemblances approach' involves delineating certain overlapping similarities

between some texts in a genre, rather than specifying a rigidly defined core for them (Chandler, 1997).

Referring to the offered definitions of genre by several researchers, they all seem to testify to the fundamental role of raising genre knowledge in creating apposite texts concordant with the respective discourse community expectations. In this regard, awareness of the conventions of the research article genre in forestry, as a discourse community, would potentially aid novice authors to compose coherent papers in terms of both communicative content and linguistic features.

1.2.2   Discourse Community

Communities can be seen as sites of engagement, providing a panorama of the discourses regularly used by a particular community. Effectively, communities include the contexts wherein the participants learn to interact and interpret each other's discussions, progressively acquiring specialist discourse (Swales, 1998). They are the domains in which academic identities are formed, relationships are cemented, recognition is achieved, and the resources required to live a professional life are obtained. The concept of community in EAP is generally associated with the notion of discipline; however, its intermingled boundaries and unclear composition seem to be hazy (Hyland, 2015).

Currently, the concept of community has become an essential notion in the field of discourse analysis because researchers are becoming interested in how scholars write and apply their genre-based knowledge. As Hyland (2005) remarks, community and genre complement each other's description, each of them helping to form and is formed by the other; both offer a descriptive and explanatory scheme that elaborates how writing decisions are socially constructed by taking into account forces outside the individual. Such forces help direct objectives, establish interactions and finally create writing.

To Paltridge (2012), discourse community is composed of a group of individuals doing and sharing a variety of communicative activities. Swales (1990: 10) asserts that discourse communities are "socio-rhetorical networks that form in order to work towards sets of common goals". He specifies particular features that constitute the basis of a discourse community. Firstly, it has an identified and established set of common public objectives. Secondly, its members apply established policies to interact with each other. Thirdly, it applies its participatory approaches such as meetings, bulletins, correspondences and so forth primarily to provide information and feedback. Moreover, it pursues the conventions of other genres in asserting its communicative goals and it has obtained some specialist lexis, as well. Finally, there is a membership threshold level admitted via an acceptable level of relevant content and discursive competence.

Many practitioners have reached a consensus on the centrality of the written texts in the academic world, a recognition that understanding the disciplines involves understanding their discourses. There are two major rationales behind this conception. Firstly, the disciplinary discourse is regarded to be a comprehensive source of information

concerning the social practice of academics. Secondly, academics communicate primarily via writing (e.g., articles, books, reviews, conference and lecture papers, research letters, and notes). In effect, the concepts of discourse community and discipline are intertwined, evolving from a common ground (Hyland, 2004). Incorporating the concept of discourse community and genre into the RA pedagogical materials can serve to expand the novice writers' extant understanding of the associations between the individual and the community they belong to. Familiarizing scholars with the research article writing conventions of forestry discipline as a discourse community, above the RA genre, would lead to a more comprehensive view towards writing research papers, social components such as surrounding texts, and the largely shared epistemology of community members.

1.2.3   The Notion of Discipline

Disciplines are believed to underpin the academic life and the integral part they serve in our academic lives is well reckoned and reflected in the calls to incorporate generic provision of educational development with local or discipline-specific endeavours (Gibbs, 1996; Jenkins, 1996). According to Devitt (2015), despite the fact that disciplines vary in some of their objectives and settings, they share the common objective of aiding students to proceed beyond superficial comprehension of genre to the intricate choices made to approach specific situations.

As Becher and Trowler (2001) assert, discipline is a notion with considerable persistence, the unique existence of which can be foregrounded by studying their rhetorical structures. By exploring rhetorical structure and linguistic patterns, members can have a sense of being part of a discipline and having a stake in some common ground with others. In this context, genres serve a key role as they are the institutionally ratified ways of achieving compromise among members. They are the oil that keep disciplines alive. ESP genre analysts have drawn to corpora with enthusiasm because such constraints and contexts introduced by genres can be revealed in the repeated patterns of everyday language use.

Despite the common belief that disciplines are expected to be distinguished by their content area, Hyland (2004), stressing on the writing styles, posits that it is how disciplines are written rather than what they express that makes the crucial difference between them. Such differences are, therefore, created through institutional and interactional forces. One main cause of such discrepancies in disciplinary discourses is that texts reflect a generic activity (Swales, 1990). They evolve on the writer's knowledge of the proceeding texts and hence reveal recurring rhetorical responses to identical contexts with each generic act exhibiting some degree of novelty and judgment. This sort of typification not only provides the individual writer with the information reservoir to proceed through the intricacies of disciplinary involvement, but also leads to academic reproduction in disciplines (Hyland, 2004).

Swales (1990) remarks that an academic community is a conventional discourse community. Following Hyland (2005), disciplinary discourse has evolved as a means of funding, constructing, displaying and negotiating knowledge. Examining texts as

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disciplinary practices moves us from the individual to the collective, and from the boundaries of the page to the activities of social beings. Because of this, some writers such as Geertz (1983) and Bruffee (1986) reject a representational view of knowledge and instead argue that knowledge emerges from a disciplinary matrix. Becher (1994: 153) refers to disciplinary communities as "tribes", each including particular values and conventions, classifications, bodies of knowledge and methods of investigation that form a specific and distinct culture.

Donald (2002: 48) considers disciplines "as homes within a larger learning community". The invoking aspect of this metaphor is that it prompts us to abandon our home to join others in the broader community, thus benefiting the contributions our disciplines offer without being stuck in it. Faculty members call their departments as their 'academic home'. Home is a sacred place. It is through departments that academic information is compiled and shielded. Although there are interconnections among departments and disciplines, we depend on "academic homes" to appeal for our share of "water and land". Becher (1989: 19) argues that "people with any interest and involvement in academic affairs seem to have little difficulty in understanding what a discipline is, or in taking a confident part in discussions about borderline or dubious cases".

There are two pivotal factors that underpin the concept of discipline. One is knowledge and the other is language (Rorty, 1979; Journet, 1990). Based on the content, the most influential work is offered by Becher (1989), and Becher and Trowler (2001). They divide disciplinary culture into four categories considering the nature of knowledge. They are as follows: a) pure science (hard pure), b) technologies (hard-applied), c) humanities (soft-pure), and d) applied social sciences (soft-applied). Another factor affecting discipline and how a particular discipline is constructed within a community is language. It is through language that particular members of disciplinary communities diffuse their new knowledge of ideational patterns, reflecting standpoints, assumptions, norms, conventions, beliefs, and values of a common culture (Widdowson, 1998). The professional language (for example research articles, book reviews, textbooks) of a discipline forms the academic culture and reciprocally aids to construct knowledge in that particular discourse community.

On the basis of the abovementioned comments, it could be deduced that knowledge presentation (content) changes according to language and such a variety prompts epistemological disciplinary diversity. In Becher's (1989) viewpoint, linguistic elements and their conceptions vary pursuant to their particular knowledge fields. The reason behind such a divergence is that in different disciplines, academics exchange various notions, create diverse types of discourses, reflect attitudes of various types and construe knowledge in different ways. Disciplines are believed to be the life blood of academic life with their rather unique linguistic and communicative patterns. Forestry as an applied hard-science discipline, involved with the interactions of human beings and nature, is expected to enjoy its relatively distinctive interdisciplinary rhetorical and linguistic idiosyncrasies.

1.2.4   Research Article as an Academic Genre

Academic writing has garnered the attention of many researchers, with studies largely focusing on the genre of research articles, a developing area that has gained momentum over the last 30 years. Academic texts like the research article are regarded a genre and distinguished by "a recognizable communicative purpose and by the presence of characteristic features with standardised form, function, and presentation that are part of its general conventions" (Thomas & Hawes, 1994: 2). Therefore, the writer must adopt the respective generic rules and standards to produce an effective research article. The potency to formulate research article based on the conventions of discourse community can aid writers to be identified in their academic disciplines (Ahamada et al., 2012).

Swales (1990) and Hyland (2000) refer to research article as the predominant genre through which scientific information is communicated. It is referred to as the primary genre having its conventional structure (Li, 2009). This "prestigious genre" is the most significant way to introduce new understanding in the science arena of today (Swales, 2004: 217). In broad terms, academic research article can be differentiated by a recognizable communicative purpose and by the presence of typical features of form, function and presentation that are part of its general conventions (Swales, 1990). For Bruce (2003), the research article in the academic discourse community is a solidly defined social genre of communication, by which writers seek to integrate their arguments into the disciplinary community consensus (Hewings, 2006).

Extensive studies on genre analysis have designated the experimental research articles as a genre outlined in a prototypical macro-structural pattern of Introduction -Methods-Results-Discussion (IMRD) (Bazerman, 1988; Swales, 1990). IMRD structure is commonly acknowledged to match the metaphor of "hourglass", ''with the introduction starting broadly and then narrowing down and with the concluding discussion incrementally moving outward'' (Swales, 2004: 234). A published research article serves as spectacles through which the conventions of writing, social practices and values of a specific discipline and research community are explored, especially when the research article has passed through the lenses of reviewers, ratified and valorised as an information reservoir and reference among academics (Johns & Swales, 2002).

1.3   Statement of the Problem

The importance of disciplinary variation in fashioning the rhetorical structure of academic texts has been widely acknowledged since the early days of rhetorical discourse analysis. The genre based approach focuses on making explicit the rhetorical structures of texts in a specific genre, the communicative purposes of different rhetorical moves within a text, and the linguistic resources used to construct the text (Johns, 1997). The notion of writing development itself has expanded beyond formal knowledge of language (Polio, 2017) and/or rhetorical knowledge in isolation. The intentionality gives rise to the different cognitive genre categories related to general rhetorical goals, to represent certain types of knowledge within discourse (Bruce, 2008). In one such study, Swales and Najjar (1987) examined the rhetorical structure of RA Introduction sections

from educational psychology and physics. They identified several differences between these disciplines, which they interpreted as resulting from the varying communicative purposes and traditions of argument development guiding their scholarly activity. At the rhetorical structure level, Cotos et al. (2017) developed a rigorous rhetorical move-step model for the Methods section of published RAs in 30 academic fields, and reported that hard and soft science disciplines form clusters based on the particular moves/steps realised in the model. The distribution of rhetorical move/steps in RAs and RA part-genres has also been found to vary even at the sub-disciplinary level. Samraj (2002) reported that RAs in two environmental science sub-disciplines (wildlife behaviour and conservation biology) employed varying sets of rhetorical moves/steps, attributing these variations to the inherent differences between the two sub-disciplines (the former being a theoretical field and the latter being applied). Lu et al. (2021), also studied Introduction sections of published RAs in social and engineering disciplines and found strong linguistic and rhetorical tendencies existed both across academic domains and within specific disciplinary fields. Both native and non-native speakers are likely to find writing research articles demanding as it involves a substantial degree of exposure to the present RAs in a specific field and ample writing expertise to craft their ideas in a way acceptable to the discourse community (Kanoksilapatham, 2005).

A considerable volume of research has been performed on the generic structure of scholarly research papers over the past three decades, particularly after Swales (1990) introduction of the Create A Research Space (CARS) model. Becher (1994) believes that there are noticeable contrasts in modes of research within individual departments. To take only a few examples, research in chemistry tends to be heavily dependent on laboratory apparatus and accommodation. At the other end of the spectrum, research in mathematics typically involves a solitary researcher armed with no more than a desk, paper and pencil. Generally, such variations possibly lead to the emergence of exclusive rhetorical moves/steps and linguistic features in each discipline. Effective research training should necessarily take such differences into account, so should general studies of the nature of academic enquiry (Becher, 1994). According to Becher's (1987) taxonomy of hard and soft sciences, pure hard sciences are cumulative, atomistic (tree like), concerned with universals, quantities, simplification, resulting in discovery and explanation. Technologies (e.g., mechanical engineering) or hard-applied sciences are characterised as being purposive, entrepreneurial, pragmatic (know-how via hard knowledge), concerned with mystery of physical environment, resulting in products/techniques. In the hard- science disciplines, both pure and applied, several fields, to name some: in pure hard-sciences (medicine, Nwogu, 1990 ; biochemistry Kanoksilapatham, 2005; mathematics, Graves et al., 2013; physical sciences, biology, organic chemistry, Bruce, 2008; wildlife behaviour and conservation biology, Samraj, 2002; chemistry, Stroller, 2013; biology, Martínez, 2003) and applied hard-sciences (chemical engineering and electrical engineering, Lu et.al., 2021; software, civil, and biomedical engineering, Kanoksilapatham, 2015; energy engineering, Ye, 2019; dentistry, Basturkmen, 2012; forestry, Joseph & Lim, 2018; agricultural science, Shi & Wannaruk, 2014; structural, environmental, electrical, chemical, and computer engineering, Maswana et al., 2015; information system, Kwan, 2017) have been studied. Such studies have led to devising different rhetorical models in various disciplines. It could be inferred from the studies conducted that a genre-based knowledge of RAs in a given discipline can assist students to overcome this challenge by becoming aware of academic writing conventions that further allow them to create sophisticated texts that are balanced in terms of both rhetorical structure and linguistic features.

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English is the global lingua franca of science publication, and numerous forestry institutions around the globe have started to require submissions for promotion in SCI (Science Citation Index) journals. Genre descriptions of research articles has ranged from Introduction (Nwogu, 1997; Posteguillo,1999; Samraj, 2002; Stroller, 2013; Joseph, 2014; Lu et al, 2021), Methods (Martínez, 2003; William, 2011; Graves, Moghaddasi, and Hashim, 2013; Maswana, Kamaru, and Tajino's, 2015), Results (Bruce, 2008; Kwan, 2017) and Discussion (Peacock, 2002; Basturkmen, 2012; Joseph & Lim, 2018) to the entire IMRD sections of research articles (Kanoksilapatham, 2005, 2015; Maswana et al., 2015; Shi & Wannaruk, 2014; Ye, 2019). However, despite the understanding that genre practices are situated community practices, there is a lack of research considering disciplinary specifications of the overall structure of forestry as an established applied hard-science discipline. Given the centrality of inter and intra-disciplinary variations, it is apt to enquire where to place a main hard science field, like forestry, as an established applied science in the topographic map of knowledge fields (Joseph & Lim, 2018). The ultimate goal of this study is an applied one, it is performed to assist novice writers who are not be familiar with the expectations of the research article genre in forestry discourse community.

On the importance of forestry, a significant notion to be considered is the connection between climate change or global warming and forests. When forests are destroyed, they release large quantities of carbon dioxide and greenhouse gases into the atmosphere which leads to global warming. Given that climate changes play an integral role in the human life, our planet experienced an excruciating pandemic crisis of Covid-19 in 2020 to which almost no definite remedy has yet been discovered. Alanna Shaikh (2020) in a TED talk speech on the Corona virus, stated that COVID-19 most likely has skipped from animals into people at a wild animal market in Wuhan, China. She further continued that this is not the last major outbreak humans are about to face and more outbreaks, more epidemics are on the way. She contends that the pandemic is a result of the way human beings interact with the planet. Part of that is about climate change and the way a warming climate makes the world more hospitable to viruses and bacteria. But it is also about the way people push into the last wild spaces on the planet. When the Amazon rain forest is burnt and ploughed to provide cheap land for ranching, when the last of the African bush gets converted into farms, when wild animals in China are hunted to extinction, human beings come into contact with wildlife populations that they have never come into contact with before, and those populations have new kinds of diseases: bacteria, viruses - stuff we are not ready for.

Examining the rhetorical structure of research articles, attending content via identification of communicative purposes assists writers, particularly novice writers, in writing coherent research articles. By subjecting learners to the valid RA samples, while notifying them of the rhetorical structure of moves and steps, it would largely be guaranteed that they can write in line with the maxims of their discourse community. Forestry research articles are expected to follow the rhetorical structure dictated by the research article genre in general, while being susceptible to the unique conventions of disciplines. As a growing proportion of non-native speakers study hard science topics through the English medium, it is clearly a pedagogical rationale for expanding the research article genre analysis to forestry as a firmly established hard science discipline. A gap in prior genre-oriented literature is the scarcity of studies on the overall rhetorical

structure of Forestry RAs, except on selected sections of Forestry (e.g., Joseph and Lim, 2018, 2019 on forestry Discussions; Joseph et al., 2014 on forestry Introductions).

The present study also seeks to investigate the ordering or cyclical patterns of moves in IMRD sections of forestry RAs. Cyclical patterning refers to the information concerning the ordering patterns of rhetorical units (moves and steps) in different genres. There is lack of research on the entire IMRD sections of forestry RAs in terms of cyclical patterns. A firm knowledge of textualization regularities and variations ascribed to move cycles in RAs, is necessary for a more solid comprehension of rhetorical structures across disciplinary fields (Hopkins & Dudley-Evans, 1988). Awareness of the cyclical patterns and ordering moves in RAs appears to be required for RA writers in the sense that if scholars are not familiar with such patterns, they are likely to be at the risk of applying queer or radically divergent ordering patterns of rhetorical moves. Through familiarity with the most typical cyclical patterns, undeniably, they would feel more flexibility in writing research articles, that means they can maintain their creativity within an approved framework.

Research on the disciplinary variations in terms of the linguistic features has also received equal attention, emphasizing the integration of corpus-based and genre-based approaches to writing pedagogy (e.g., Charles, 2007, Chen & Flowerdew, 2018; Cotos et al., 2017). In recent years, a primary goal of move analysts has been to identify the linguistic features characterizing rhetorical moves, called function-form gap from an applied genre perspective (Moreno & Swales, 2018). Hyland (2010) leads us to the idea of interpersonality in academic writing, which is concerned with the ways writers use the explicit system of meanings to enter their 'voice' or 'authorial stance' (hedges, boosters, self-mentions, attitude markers) into the texts, to be heard by their readers. As academic writing is attracting increasing attention of researchers, the writer's identity or authorial stance has arisen as an important aspect to consider. To achieve this goal, writers ought to be well aware of the norms of the community they are writing for. Awareness of stance markers in RAs helps writers to rationally attune, particularly in terms of certainty or commitment, the functions they seek to induce in each rhetorical unit of their research papers. Problems in presenting an effective authorial stance have frequently resulted in poor evaluation of a writer's text and research potential (Bahrami et al., 2018). Many papers submitted by novice writers are rejected not so much due to the serious lexical or syntactic errors in propositional content, but rather because of problems with argumentation, particularly through hedges and authorial voice (Flowerdew, 2001; Englander, 2006). In fact, writers offer interpretations of their data and persuade readers of their claims using stance markers (Jiang & Hyland, 2015). However, studies on the distribution of stance markers across moves in the entire IMRD sections of RAs, particularly in hard sciences are scarce. This study seeks to fill this gap by identifying stance markers, as linguistic features, applied in the rhetorical moves of the overall IMRD sections of forestry RAs, as an applied hard science. Addressing the discipline-specific writing needs of novice writers, the present study contributes to the emerging body of genre analysis research by integrating corpus-based and genre-based approaches in academic writing pedagogy. By establishing the more salient types of linguistic features occurring in specific rhetorical moves in forestry RAs, the novice writers who have limited research writing skills can improve in writing persuasive RAs in English.

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1.4   Objectives of the Study

Although the research article genre has been examined several times, the variations within this genre via studying various constituent disciplines necessitates researchers' ample attention. Move analysis is a text analytical approach first developed by John Swales (1981) to investigate the underlying generic structure of research articles in terms of constituent moves and steps, mainly for pedagogical purposes. A widely shared aspiration of move analysts has been to identify the linguistic features characterizing the various RA moves (Moreno & Swales, 2018).

Primarily motivated by the pedagogical question whether it is feasible to incorporate specialists' RA exemplars into teaching contexts, in the first objective, this study investigates the extent to which RAs in forestry conform to the established conventions of international scientific communities in terms of macro, move or rhetorical structure. Regarding objective 2, the present study seeks to analyse the cyclical patterns realising in the Introductions, Methods, Results, and Discussion sections of the forestry RAs. As such, in line with objective 1, the cyclical patterns of moves in IMRD sections are studied in order to further solidify the disciplinary rhetorical uniqueness of forestry. Finally, objective 3 aims to identify linguistic features, stance markers in this study, that are applied in each rhetorical move of forestry RAs.

1.5   Research Questions

1. What is the rhetorical structure of the Introduction, Method, Result and Discussion sections of research articles across ISI journals in the discipline of forestry?

2. What are the cyclical patterns revealing in the Introduction, Method, Result and Discussion sections of forestry research articles across ISI journals?

3. How are stance markers (hedges, boosters, attitude markers and self-mentions) patterned in each Move in the Introduction, Method, Result and Discussion sections of forestry research articles across ISI journals?

1.6   Significance of Study

Genres, their typified characteristics and inner variability have been proven of growing interest to ESP researchers, since the core mission of ESP is preparing students to apply English in their target contexts such as study, work, and/or life (Hyon, 2017). Genres may also be popular in ESP because of their "nice" size for language teaching (Paltridge, 2001). Therefore, Swales' initial motive for developing a text analytical system via move analysis was to assist advanced learners for whom English is not their first language, to enhance their reading and writing skills of RAs in English. In other words, it is primarily developed by Swales to help non-native novice writers to improve in writing RAs.

Research article is a major channel of scholarly communication between various disciplinary fields, and if researchers' papers are not organised in the conventional rhetorical structure, it may not be possible for them to be publish their research. In such cases, awareness of the rhetorical structure and the linguistic features of research articles in the respective discourse community would be of substantial aid to researchers.

Since junior research writers are unfamiliar with the highly predictable communicative functions of rhetorical moves in RAs, EAP researchers seek to open up the genre scene with texts and their structures, especially to second-language writers (Johns, 2011). Such studies, moreover, trigger researchers to develop disciplinary models of the rhetorical structure of RAs in disciplinary fields based on the authentic patterns of language use evidenced in the RA context. In the case of the current study, the proposed model assists forestry scholars, to abridge the RA writing course by following footprints of the expert fellow discourse community members. However, it is noteworthy to underline that learners also need to maintain their creativity and liveliness in terms of the linguistic realisations and linguistic features of moves/steps, figuratively like they are performing dance movements within a specific dance genre, a skill that is a by-product of extensive exposures to the target genre samples.

From the standpoint of function, studies on the application of linguistic features in each rhetorical unit of research articles assists authors to gain insight on the typified stance markers, in this study, that are employed in each sub-division of RAs (IMRD) and each disciplinary field. It provides learners with invaluable guidelines to secure the targeted perception and ratification of their research by prospective readers, via measured application of hedges, boosters, attitude markers and self-mentions. In fact, the present study mainly pursues pedagogical goals, as findings from such studies could be of notable assistance to ESP instructors in general, and to forestry research educators, in particular, in order to notify novice writers of rhetorical and linguistic expectations of RAs in their respective academic field. In fact, studies of such a nature could provide data that assists EFL and ESL scholars in writing standard RAs acceptable to the competent members of their disciplinary community.

Sometimes novice writers, who could be professional researchers, seem to be unaware of the critical significance of generic conventions of the research article genre, considering it as a marginal notion. Given the fact disciplinary knowledge is meant to be primarily validated by the expert members of respective discourse communities, attending to content and form, both rhetorical and linguistic, would be a secure approach for wary conservative writers. To disseminate knowledge, it is indispensable to communicate it via elucidate or straightforward, and at the same time academically and culturally acceptable and non-offensive discourse. The study of "rhetorical description" of the "rhetorical moves" (Kanoksilapatham, 2005: 270), "macro-structural organisation" (Yang & Allison, 2004: 265) or "move structure" (Rubio, 2011) and "micro-level features" or "cohesive devices" (Sampson, 2008) of research articles serves as the main channel in codifying disciplinary knowledge. Referring to these studies, stance markers are a component of micro-level analysis of RAs.

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1.7   Scope of the Study

The present study aimed at exploring the genre structure of forestry research articles in both macro-level (rhetorical structure) and micro-level (linguistic features). From the rhetorical vantage, the Introductions, Methods, Results, and Discussion sections are analysed in terms of the organizing rhetorical structure and cyclical patterns of moves. Examining from the linguistic vantage, stance markers are studied. Stance markers include hedges, boosters, attitude markers and self- mentions. Findings from this research would assist forestry writers, particularly novice authors to compose research articles conforming to the expectations of their discourse community. Moreover, by calibrating and applying the appropriate level of stance markers, acceptable to the specialists in the field, students would be able to promote their research in research articles more efficiently, mainly by adjusting commitment and assertion level of their opinions, attuned to their disciplinary community expectations.

1.8   Theoretical Framework of the Study

An integral tenet in genre-based approach to text analysis is the belief that written genres can be identified through an analysis of rhetorical structure (Kanoksilapatham, 2005) as well as linguistic features (Hyland, 2007). Theoretically, to analyse rhetorical structure of research articles, the current work is based on the "genre analysis" theory by Swales (1990) originated from the ESP tradition. To explore the stance markers employed in each move of RAs, Hyland's (2005) model of academic interaction is applied as the theoretical orientation.

1.8.1   ESP Genre Analysis Theory (Swalesian)

ESP has existed since 1960s and researchers begun using genre analysis as a research and pedagogical tool to study mainly the rhetorical structure of research articles, not to mention other genres, since 1980s. It was John Swales' (1990) groundbreaking book "Genre Analysis: English in academic and research settings" that most fully provided methodology for introducing genre analysis to ESP studies and teaching. His work on the theory of the generic structure of documents, rhetorical moves and communicative purposes is regarded fundamental in shaping ESP genre theory (Hyon, 1996). Swales' study has inspired research on RAs over the last two decades, making ESP and genre analysis to become synonymous in many aspects (Belcher, 2019; Cheng, 2007).

Swales' genre analysis focuses on both form and function. He emphsises that the core of genre and its communicative goal does not lie in the text alone, but also the roles of the text perform in their contexts, the congruent and conflictive values positioned on them by professional disciplinary members, and the expectations those members have of the structuring conventions of the genres they participate in (Swales, 1985). Swales (1990) concedes that since the 1960s, ESP studies have become more comprehensive and multi-layered than those early form-focused quantitative research. This in-depth or multi-layered textual account has sparkled an interest in analysing rhetorical goals,

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decoding information structures and attending syntactic and lexical options (Swales, 1990).

Discourse communicative goal shared by the members of the same discourse community, is at the heart of Swale's genre concept. In other words, it is this purpose oriented rationale that shapes a genre's conventions (Mavor & Trayner, 2001). Zhang (2012), in explaining the connection between genre and rhetoric research, asserted that a genre may include a sequence of actions defined as rhetorical units and established in recurrent circumstances. Genre analysis studies of research articles, therefore, attempts to clarify how rhetorical structure of texts is useful in backgrounding the textual practices. It should be noted that genre analysis approach suggested by Swales is based particularly on research articles as the primary channel of disseminating knowledge in disciplinary fields within the ESP domain. In this regard, Grave et al. (2013) pointed out that connecting macro-rhetorical information and structural [linguistic] markers is important in learning how to write in a particular discipline to develop effectively organised arguments in research papers. The present study concerns the application of genre analysis approach in the analysis of research articles at both macro-level (rhetorical structure) and micro-level (linguistic features).

1.8.2 Hyland' (2005) Model of Academic Interaction

As academic writing has received increased scrutiny from researchers and educators, the writer's identity and interaction with readers within the text have emerged as critical issues to study. Hyland's (2005) interactional model of metadiscourse summarises the whole spectrum of interactional metadiscourse with two types of interactions: *stance markers* and *engagement markers*. The concept of stance is defined as a speaker/writer's self-positioning toward what is being stated or realised, whereas engagement describes how a speaker/writer attunes to and connects with a listener/reader.

The current study, however, only concerns with stance markers. Figure 1.1. illustrates interactional model of metadiscourse proposed by Hyland (2005), including the four stance markers: *hedges*, *boosters*, *attitude markers*, and *self-mentions*. Hedges are linguistic devices, such as *almost*, *possible*, and *might*, that allow writers to modify the level of commitment and certainty toward the proposition and to attend to the likely negative responses or rejections from readers. Boosters, instead, are expressions such as *clearly*, *must*, and *prove* which amplify the writer's argument by highlighting authorial and the assertiveness certainty of the claims. Attitude markers convey writers' affective position rather than certainty, reflecting the writer's view agreement toward a proposition, in terms of agreement (*agree*, *prefer*), surprise (*surprisingly*, *appropriately*), or value (*important*, *amazing*). Finally, self-mentions are defined as the overt presence of the author in a text, as in the subjective 'first-person pronouns' *I*, *my* or 'inclusive plural pronoun' *we* and *us* and 'the others' such as *the author*, *the writer*. Engagement can be reflected in reader pronouns: *you/your* are used to bridge the communication gap between writer and reader. However, since engagement is not the concern of this study, the discussion on its definition stops here.

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                                              ┌──────────────────┐
                                              │ Hedges           │
                    ┌──────────┐              │ Boosters         │
                    │ Stance   │─────────────▶│ Attitude Markers │
                    │ Markers  │              │ Self-mentions    │
                    └──────────┘              └──────────────────┘
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Interactional Metadiscourse

```
                                              ┌──────────────────┐
                                              │ Reader pronouns  │
                    ┌────────────┐            │ Directives       │
                    │ Engagement │───────────▶│ Questions        │
                    │ Markers    │            │ Shared knowledge │
                    └────────────┘            │ Personal asides  │
                                              └──────────────────┘
```
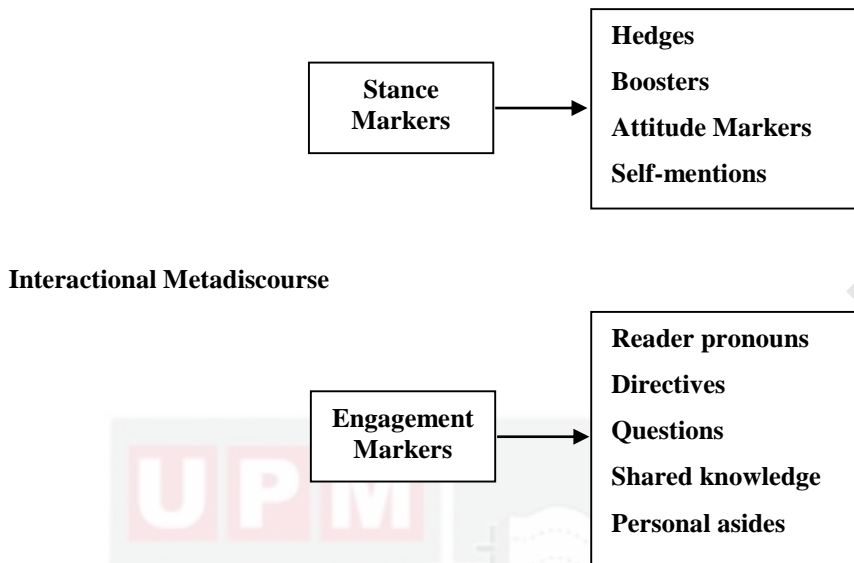
Figure 1.1: Interactional Model of Metadiscourse
(Source: from Hyland, 2005)

1.9 Conceptual Framework

The present study applies Swales' (1990) genre theory, rooted in English for Academic Purposes (EAP) approach, to study the rhetorical structure and cyclical patterns of IMRD sections of forestry research articles. Regarding the linguistic aspect of the present study, the researcher employed Hyland's (2005) interactional model of metadiscourse to examine stance markers namely, hedges, boosters, attitude markers, and self-mentions realised in each IMRD section moves. The conceptual framework of the current study is presented in Figure 1.2.

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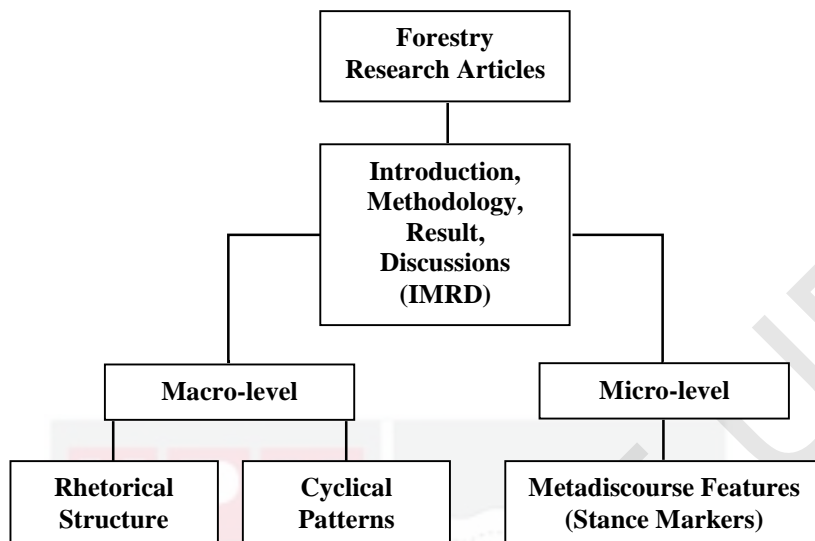
Figure 1.2: Conceptual Framework of the Study

1.10   Definition of Key Terms

Genre: It is a set of communicative endeavours, the performers of which share the same set of communicative purposes retrospective to the discourse community they participate (Swales,1990). Genre analysis framework (1990) is derived from move analysis, a text analytical method developed by Swales (1980) originally for analysing rhetoric structure of research article Introductions.

Move: Moves are "discoursal or rhetorical units performing coherent communicative functions in texts", whose linguistic realisations may be very variable in length and in other ways (Swales, 2004: 228-229). Swales' original motivation for developing this text analytical scheme was to help advanced students for whom English is not their first language to improve their reading and writing of RAs in English.

Step: Steps are the multiple text fragments that "together, or in some combination, realise the move" in such a way that "the steps of a move primarily function to achieve the purpose of the move to which it belongs" (Biber et al., 2007: 24).

IMRD: Refers to Introduction-Methods-Results-Discussion sections of research articles. Research papers that follow this structure provide readers the opportunity to find the main points by comparting the most critical information in several assigned sections (IMRD).

Research Article (RA): The research article (RA) is considered a genre typically significant for those conducting research community (Árvay–Tankó, 2004). Both students and lecturers regard research articles as principally relevant genres, since through this channel, the researchers are initiated [to assimilate] to the academic community (Futász, 2006). It refers to journal articles in both empirical fields like Forestry and non-empirical fields such as Philosophy; it also includes review articles (Swales, 2004).

Cyclical Patterns: The term move cycling has been referred to as cyclical patterning, move repetition, move reiteration, and recursive patterning in across different sources in the literature. Rungnaphawet (2016) gives a tentative definition of the term move cycling, referring to it as a textual feature characterised by the reiteration of a single move or more to accord with the organisation of the accompanying text, to comply with the convention of the corresponding discourse community, or to serve an individual's communicative purposes, or a combination of these. In effect, it is a feature of texts, in this case research articles, that suspends between the authors' personal communicative style and the discourse community they belong to.

Rhetorical Structure: Rhetoric is defined to be the art of persuasion by Lynn (2010). Genre analysis theory is proved to be applicable for studying the relationship between a particular text type and its context by dividing a text into small semantic units called moves. Each move has a discrete communicative purpose that is shared among community members (Swales, 1981-1990). The combination of moves reveals rhetorical structure of a text and their sequence is based on the author's communicative goals (Muangsamai, 2018).

Stance Markers: According to Hyland (2005: 178) stance includes three main components of evidentiality, affect, and presence. By 'evidentiality', he refers to the "writer's expressed commitment to the reliability of the propositions he or she presents and their potential impact on the reader", next 'affect' refers to a "range of personal and professional attitudes towards what is said, including emotions, perspectives and beliefs", and 'presence' is "the extent to which the writer chooses to project him or herself into the text." Hyland's framework of stance includes these components through the use of *hedges*, *boosters*, *attitude markers,* and *self-mentions*. These components are associated with three important rhetorical questions that academic writers may bring to any statement about a text: "how certain do I want to be about this?", "what is my attitude towards it?", "do I want to make myself prominent here?" (Hyland, 2016: 248).

Hedges: Hedges are writers' attempt for recognizing alternative voices and viewpoints and therefore withholding commitment to readers (Hyland, 2005). Hyland (1996) posited that hedging is mainly expressed through modal verbs expressing possibility (*e.g., may*); semi-auxiliaries (*e.g., appear, seem*); probability adverbs (*e.g., probably, likely*); verbs (*e.g., suggest, propose, speculate*); words that express quantity, degree, frequency and time (*e.g., approximately, roughly, somewhat, quite, often, occasionally*); and phrases that express authors' personal involvement (*e.g., to my knowledge, it is my view that*).

Boosters: Boosters allow writers to express their conviction and confidence about the validity of a proposition (Holmes, 1988). Hyland (1998) believes that boosters function to express conviction, assert propositions, represent strong claims, and stressing information. A booster is a linguistic device which intensifies or increases the force of an utterance; in other words, it makes a statement more powerful (Livingstone, 2019).

Attitude markers: Attitude markers reflect the writer's affective, rather than epistemic, attitude to propositions. They function to convey surprise, agreement, importance, frustration and so on, rather than commitment.

Self-mentions: Self-mention is associated with the way authors project an impression of themselves and how they stand in relation to their arguments. This can be achieved through the use of 'first person pronouns' like *I*, *me*, *my*, *our*, *mine* and *us*, and 'other self-mentions' such as *the author*, *the writer*, *the authors* and *the writers* (Hyland, 2005).

1.11   Summary

The present study has applied genre analysis approach to identify communicative functions in Introductions, Methods, Results, and Discussion sections of forestry research articles. The research articles explored are to be selected from forestry discipline ISI journals. The study findings are expected to shed light on the rhetorical structure in IMRD sections of forestry research articles. Another goal of this study is to examine the cyclical patterns of forestry research articles in each IMRD section moves. The final goal of this study is to explore stance markers, including *hedges*, *boosters*, *attitude markers*, and *self-mentions* in each move of IMRD sections. The study findings can help forestry novice writers, as well ESL research educators, and supervisors in more meticulous evaluation of their students' research papers. Some conducted research on both rhetorical structure and stance markers of forestry RAs will be reviewed in the next chapter.

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BIODATA OF STUDENT

Zahra Nasirizadeh was born in 1981 in Firuzabad, Fars, Iran. In 1999 she attended Shiraz University, Iran and received B.A degree in English Literature in 2002. She pursued her M.A level study in Teaching English as Second Language (TESL) in Shiraz University and graduated in 2005. Her thesis was on "the effects of phonological features on Iranian EFL learners listening comprehension". Zahra lectured ESP, general English and TOEFL courses in Shiraz University, Shiraz Azad University and some non-profit universities during 2005 to 2010. She started her study at PhD level in English studies in the Department of English Language, Faculty of Modern Languages and Communication, Universiti Putra Malaysia (UPM), Malaysia. Her dissertation concerns Academic Writing, English for Specific Purposes (ESP), in the genre of research articles. She has been involved with teaching academic writing to Nigerian, Arab, Chinese and Iranian students.

My PhD journey was an opportunity for transformation, a journey to reflection and self-excavation. And finally, quoting from Hafez "*We are poor and yearning to reside in heaven"* (Moflesanim o havaye mey o motreb darim مفلسانیم و هوای می و مطرب داریم)

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LIST OF PUBLICATIONS

Nasirizadeh, Z., Paramasivam, S., Nimehchisalem, V., & Omar, N. (2022). Rhetorical Structures and Cyclical Patterns in Forestry Research Articles. *GEMA Online Journal of Language Studies*, *22*(2).

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