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An Examination of the Introduction Genres in Civil Engineering Research Articles

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Research Article
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Abstract

Utilising Swales's 1990 CARS (Create a Research Space) paradigm, this study delves at the structures of RA introductions in the field of civil engineering. Using the move structure and language criteria that would suggest its usage or avoidance, it analyses the introductions of fifteen research publications in Civil Engineering. Despite not following the model's recommended order, the results reveal that the move-pattern in RA introductions of this field follows all three movements. Given its continued applicability, the pedagogy of the CARS model has the potential to significantly contribute to the improvement of ESL/EFL/ESP students' reading, writing, and topic knowledge.

Keywords: genre analysis, English for specific purposes, Create a Research Space (CARS) model, civil Engineering research article introductions

1. Introduction

Researchers all around the globe are always looking for better ways to do their jobs, and one of the new areas that is popping up is academic writing. An academic world has emerged as a result of this expanding research culture. Prior understanding of the ideas, values, and norms employed by professionals in the discourse community is expected of students and academic writers in order to enter this society (Swales, 1990; Duszak, 1994). In addition to its many official and lingua franca designations, the English language has solidified its position as the de jure worldwide language of academic study and research. Because of this, a lot of people who aren't originally from the United States are using written English to communicate. If they want to be published and acknowledged in their profession, non-native English authors need to follow the norms of conventional English rhetorical styles (Swales 1981). Many people do not consider English to be their first language. Both native and non-native speakers of the language learn it. Even though students acquire English throughout their academic careers, research has shown that even highly proficient English language learners have challenges when it comes to organising their written academic discourse (Cumming, 1995; Dudley-Evans, 1995; Swale, 1990). Academic writing in English in countries where English is not the national language has benefited from new pedagogical approaches and updated course materials developed in response to the challenges faced by non-native speakers. According to Dudley-Evans (1994) and Swales (1990), genre-based pedagogy is a rich resource for teaching academic English writing since it focuses on the organisation and macrostructure of texts. The intricacy, rhetorical aim, and style of expression of each genre were unique. Students of writing as a second language would do well to familiarise themselves with the conventions and patterns of many genres so that they may more effectively create texts and written discourse in their target language. In English as a Second Language (ESL) studies and classroom instruction, the concept of genre is crucial. Swales' (1981, 1990) research has served as a foundation for ESP genre analysis. For reviews of this work, see Paltridge (1994, 2001), Hyland (2004a),

Swales (1990, 2004), and others. These studies analysed the discourse structures and language features of various types of academic writing, including research articles, master's theses, doctoral dissertations, letters of recommendation, job applications, legislative documents, academic lectures, poster sessions, and course readings. Among the many types of written academic prose, research articles are among the most common. Distinguishing characteristics include "a recognisable communicative purpose and by the presence of characteristic features with standardised form, function and presentation that are part of its general conventions." (Chawes and Thomas, 1994).

1.1 Problem Statement

English is an official language of various countries including Pakistan and learners are exposed to it in their early ages. Learners, not only learn English language in school but they also study English as a compulsory subject in their graduation studies. Moreover, it is not only English language classroom where they interact with the English text, but they also get exposure to English language in different subjects because of it being the medium of instruction. Writing tasks are perceived “threats” by students when they are all of a sudden asked to compose any type of written document, may it be a letter, an application or any specialized genre such as research paper.

Tertiary level learners face difficulties when asked to write research articles in English. Although they have some command over the language owing to the exposure of English language in their educational life, yet they get apprehensive. When students, enrolled in engineering disciplines, are given task of writing research article without any guidance and its conventions, they end up with frustration and avoid taking research in their educational years. Reasons behind frustration is that they are neither told about its genre knowledge, nor they are trained into academic writing. Genre knowledge is crucial as it helps in writing especially for tertiary level students as they are supposed to write academic texts according to its disciplinary specialization at university. According to the study of Zhu (2001), English as a Foreign Language (EFL) learners or English as a Second Language (ESL) face challenges in thesis writing. Hyland (2004) found postgraduate thesis written by L2 writers a genre that continues to be somewhat of neglect, although various researches have been led in the context of EFL/ESL students with differing rhetorical structures in their L1. This leads us to the understanding that “a logical argument is thus culture bound” (Kaplan, 1966). This means what one language considers a logical argument, may not be the same in another language. Consequently, these rhetorical structure differences tend to create complications for the students of EFL/ESL in their writing although their English apparently is of high proficiency level (Nimehchisalem et al., 2016).

1.2 Justification and Importance

Studies related to research article introductions written in Arabic, English, Malay and Spanish have been explored. A lot of research studies have adopted Swales’ CARS model (1990) for genre analysis of their research article introductions. Studies have shown that Swales CARS model (1990) have not only adopted for other languages research articles introduction, it has been adopted by researchers in exploring genre analysis of medical, Islamic, applied linguistics and software’s engineering research article introductions but none has used for civil engineering’s research article introductions. The result of this study can help in pursuing academic writing strategies for novice Civil engineering /researchers and learners who want to write in English and want to their work to be acknowledged in English academic journals. It can provide insights to civil engineering learners/ researchers in giving clear understanding of how academic writers organize academic texts.

1.3 Literature Review

Genre became a focus in the field of applied linguistics back in the 1990s, Swales gave a comprehensive definition of it in the context of English for Specific Purpose (ESP) in *Genre Analysis: English in Academic and Research Settings* (1990):

> “A genre comprises a class of communicative events, the members of which share some set of communicative purposes. These purposes are recognized by the expert members of the parent discourse community, and thereby constitute the rationale for the genre. This rationale shapes the schematic structure of discourse and influences and constrains choice of content and style. Communicative purpose is both a privileged criterion and one that operates to

keep the scope of a genre as narrowly focused on comparable rhetorical action. In addition to purpose, exemplars of a genre exhibit various patterns of similarity in terms of structure, style, content and intended audience. If all high probability expectations are realized, the exemplar will be viewed as a prototypical by the parent discourse community. The genre names inherited and produced by discourse communities are imported by other constitute valuable ethnographic communication, but typically need further validation." (p. 58).

Like Thomas and Hawes (1994) stated research article (RA) is a genre, it is pivotal researchers observe the generic rules and convention to produce an effective article. This results in recognition in their discipline through publication of that research work.

Thus, genre analysis has become a valuable tool in describing and connecting the linguistic features of a genre to their function and purpose. It offers a method to classify the linguistic features and the communicative strategies or moves in genres.

A significant study by Swales (1990) formed the theory of genre in ESP which concentrated on the organization of specific sections of research article, particularly the 'introduction'. The move structure analysis is central to this approach as it requires identifying repetitive patterns generally employed to organize the text of a genre, and later linking the stages of this text-organizing pattern to particular linguistic features (Bruce, 2009). Subsequently, Swales (1990) proposed the revised version of his model, namely Create a Research Space (CARS) model that can serve as an analytical tool to examine the rhetorical structure of introductions of RA.

The modified model is included the 3 move-steps (Tongsibsong, 2012). (The detailed structure of the model is presented in the Conceptual Framework, Methodology section):

Move 1: Establishing a territory

Step 1 Claiming centrality and/or

Step 2 Making topic generalization(s) and/or

Step 3 Reviewing items of previous research

Move 2: Establishing a niche

Step 1A Counter-claimingor

Step 1B Indicating a gap or

Step 1C Question-raising or

Step 1D continuing a tradition

Move 3: Occupying the niche

Step 1A Outlining purposes or

Step 1B Announcing present research

Step 2 Announcing principal findings

Step 3 Indicating research article structure

Various researches have been conducted on the rhetorical structure of RA introductions. Samraj (2002) applied the CARS model to analyze RA introductions of two fields; Wildlife Behaviour and Conservation Biology. A greater degree of embedding was found in the analyzed texts, which was not captured by the CARS model. The findings showed reference to former literature is an element that can be found in diverse moves in the model. Moreover, the researcher found variation in steps, for e.g., "positive justification" that is not a part of CARS model. Anthony (1999) also identified the use of "evaluation step" which also is not accounted in CARS model. He found this step recurrent in all the software engineering RA introductions. Both Samraj and Anthony believed although CARS model did capture the core rhetorical organizations of the introduction, it has to be more flexible towards some variations or features that are specific to the discipline.

This study has used Swales' CARS (Create a Research Space) model (1990), shown in Figure 1, for move analysis in order to find out whether all three moves, presented in model, are used by Civil Engineering researcher or not. This Swales' CARS model (1990) has proposed three moves for RA introductions. First move starts where author is establishing a territory which is followed by second move of establishing a niche and the second move is followed by the third move where author is occupying the niche. CARS model is used by many researchers for identifying the pattern used in research article introductions (Tongsiburg, 2012;

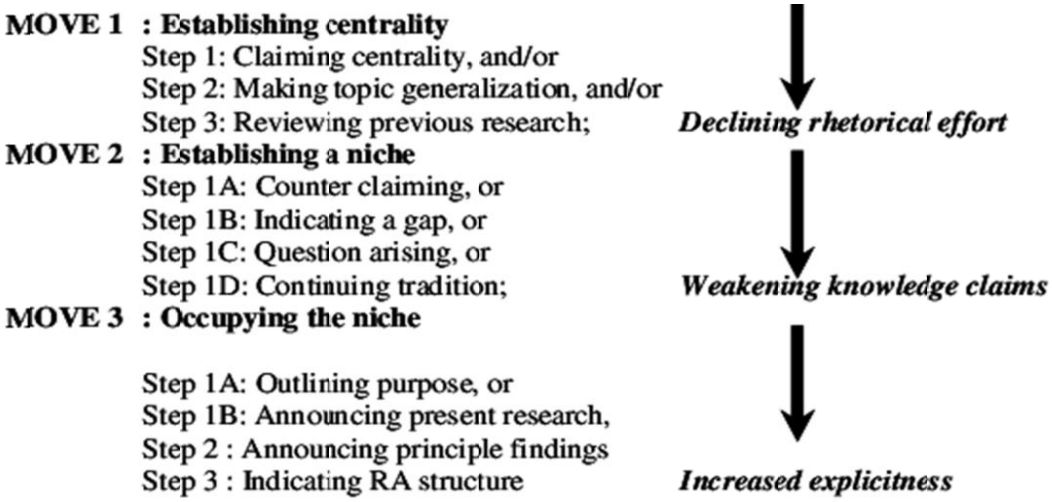


Figure 1. Swales CARs Model (1990)

1.4 Objectives and Research Questions

The present study explores how Swales' CARS model (1990) is applied by Civil engineering researchers in their research articles' introductions. Following are the objectives of the research:

1) To identify structure of Civil Engineering research article introductions using Swales' CARS model (1990).
2) To find out whether moves from Swales' CARS model (1990) are used by Civil Engineering researchers.
3) To find out moves ignored from Swales CARS model by Civil Engineering researchers. Following are the research questions:
1) What moves from Swales' CARS model are used by Civil engineering Researchers?
2) What moves from Swales' CARS model are not used Civil engineering Researchers?

2. Method

2.1 Data Collection

This research aims to explore the data surrounding the freely available and downloadable civil engineering RA introductions, hence the corpus was acquired using a purposeful sample method. This study's sample included 15 RA introductions and research papers published in Taylor & Francis's impact factor civil engineering and environmental journal between 2014 and 2017.

Analysis of Data (2.2)

In order to analyse moves, Swales' CARS model (1990) was used. The chronology of each RA introduction was evaluated step-by-step. Sentences were the building blocks of the analysis, which were then classified according to the CARS phases and motions.

subject (Tongsiburg, 2012; Ahamad & Yusof, 2012; Jogthony, 2001; Swales & Najjar, 1987; Samraj, 002; Anthony, 1999). In order to find out whether Civil Engineering Researchers follow the pattern from the Swales CARS model, we looked at the organisation of steps in RA introductions. According to Swales (1990), the analysis focused on the specific steps involved in each motion, which are derived from language elements that signal the employment of that step. The purpose of this move-step study was to identify the actions and processes that researchers in the field of civil engineering prefer, as well as to identify variances in the steps used to introduce research articles published in

the Taylor & Francis Journal by these same researchers.

3. Results

In Civil Engineers' Research Article introductions were coded in numbers according to the year of publication and the move- structure was found by Move-step analysis. It showed the move-pattern's types followed in the corpus. Table 1 illustrates the findings of move-structure below.

Table 1. Move structure of civil engineer's RA introductions

RA Introductions	Year of publications	Move-pattern
Code 1	2014	1-2-3-2-1-2-3-1-2-1
Code 2	2014	**1-2-1-2-1-2-1-3**
Code 3	2014	1-2-1-2-1-2-1-3-2-3
Code 4	2015	**1-2-1-2-1-2-1-3**
Code 5	2015	1-2-3-1-2-1-3
Code 6	2015	1-2-1-2-3
Code 7	2016	1-2-1-2-1-3
Code 8	2016	**1-2-3**
Code 9	2016	1-2-1-2-1-2-1
Code 10	2016	1-2-1-2-3-2-3
Code 11	2016	**1-2-3**
Code 12	2017	1-2-1-2-3
Code 13	2017	1-2-1-2-1-2-3
Code 14	2017	1-2-1-2-3-1-3
Code 15	2017	**1-2-1-2-1-2-1-3**

The findings showed in the above table that variations do exist in the move structure of the Civil engineering's RA introductions as compared to Swales' CARS model (1990). The table shows that two articles coded as 8 and 11 follow the linear move-pattern of M1-M2-M3 as described in the CARS model. The predominant move-structure M1-M2-M1-M2-M1-M2-M1-M3 was found in article coded as 2, 4 and 15. The article code as 9 did not follow the move 3 it has only followed move M1-M2. The other remaining coded as 6 and 12 showed the M1-M2-M1-M2-M3 move structure where as other remaining followed the all three-move structure but with some variation in accordance with Swales' CARS model (1990).

Introduction coded as 15 showed the M1-M2-M1-M2-M1-M2-M1-M3. Excerpt 1 shows the steps sequence appeared within each move structure found in introduction 15 with the help of sentences.

Excerpt 1.

Move	Step	
1	S1	**S1)** The past decades, practice and literature have shown an increasing interest in Systems Engineering (SE) in the civil engineering and construction industry.
	S2	**S2)** System Engineering integrates all the disciplines and specialty groups into a team effort forming a structured development proceeds from concept to production to operation.
	S3	**S3)** Water boards are also clients who play an active role in the construction market. As a construction client, they directly engage in the design and production of a system and have a large influence on both the process and the product to be developed (Gann & Salter, 2000).
2	S1A	**S4)** Understanding how SE is applied in these projects increases the understanding of SE application in general and may stimulate further, more widespread use of SE.
	S1B	**S5)** Also committees and working groups, such as the INCOSE infrastructure working group, are exploring the use of SE in civil Engineering, and in the Netherlands the two main clients of civil engineering projects, Rijkswaterstaat and Prorail even prescribe the use of SE in all their projects (ProRail et al., 2008).
3	S1A	**S6)** The study explores to what extent SE is applied in relatively small and less complex projects of a Dutch water board.
	S1B	**S7)** In this study, six civil engineering SE projects of the project department of the water board are analyzed.
	S3	**S8)** The paper is structured as follows: in section two…

In this introduction, the Civil Engineer researcher starts with the Move 1 that is 'establishing a territory. He has claimed centrality of the topic by stating as interest being found for System engineering (S1). In the following step he has made generalization for the topic about SE to be

operated (S2). He has reviewed item of previous research and described the impact of water board on the design with the help of citation (S3). Moreover, move 1 is followed by move 2 where researcher 'establishes a niche'. He has counter claimed with the help of researches been done to understand that SE application can be taken to as a widespread use (S4). Gap has also been indicated to explore the use of SE in civil engineering (S5). After move 2, move 3 was found, where researcher 'occupies the niche'. He has outlined the purpose of the research by stating that study aims to explore the application of SE in projects of Dutch water board (S6). He has further announced the present research by

describing the six civil engineering SE projects were analyzed (S7). He ended introduction by stating out the organization of paper that study had (S8). Table 2 shows the summary of step structure found in RA.

Table 2. Instances found in the CIVIL Engineering research article introductions.

Move	Step	Instances found in the article introductions
1	1	36
	2	30
	3	26
2	1A	26
	1B	31
	1C	1
	1D	-
3	1A	13
	1B	13
	2	2
	3	7

Table 2 shows the frequency of steps within each move. As it has showed that in move 1 (establishing a territory) step 1 occurred frequently belonging to 36 sentences. This means Civil Engineering Researchers focus more on claiming the centrality and importance of the topic. Step 2 and step 3 are preferred but is given less important as those steps shows generalization of the topic and the reviewing items of previous research paper. In move 2 (establishing a niche) it is the step 1B which frequently occurred with the allocation of 31 sentences. Researchers are interested in stating the gap rather than counter claiming (S1A), question raising (S1C) and continuing a tradition (S1D). Whereas in move 3 (occupying the niche) step 1A (outlining the purpose) and 1B (announcing present research) are observed important steps towards the researcher with the allocation of 13 sentences as compared to step 2 (announcing the principal findings) and step 3 (indicating research article structure).

4. Discussion

The Civil Engineering RA introduction move-pattern follows all three movements, as seen in the previous section, although it does not follow the model's prescribed approach. There were differences in the arrangement of steps and the steps themselves inside each motion. Only three of the fifteen RA introductions adhered to the CARS-illustrated scheme of organisation. According to the results, the most common structure was found to be M1-M2-M1-M2-M1-M2-M1-M3, and the third move in the introduction was disregarded. The introductory sections provided background on the new approaches, discussed their use in various contexts, introduced new design concepts, and proposed operational methods that may be used in Civil Engineering research. First step (claiming centrality) in move 1 (creating territory) was shown by step preference findings to be the most important. A total of 36 statements were identified that asserted the relevance of the current study's subject. From S1 to S5, the usage of language characteristics like "nowadays," "have been made," "have evolved," "recently," "has become," etc., shows that the issue is important to the Civil Engineer researcher. Steps 2 and 3, in which they drew topical generalisations and cited relevant research, were likewise highly

valued by civil engineering academics. Here are a few examples of the first step of the first move.

5. Conclusion

Using Swales' CARS model from 1990, the research analysed Civil Engineering RA introductions to determine their move-pattern and the organisation of the move-step sequence inside each move. The above findings demonstrate that the CARS model's recommended movement pattern is not strictly adhered to in the introduction of Civil Engineering RAs. The liner M1-M2-M3 motion pattern suggested by the Swales in CARS model 1990 was followed by just two of the fifteen introductions. Islamic RA introductions followed a tiny pattern of M1-M2-M3, according to research by Ahamad and Yusof (2012). In the introduction to Civil Engineering RA, the most common structure was M1-M2-M1-M2-M1-M2-M1-M3. This study is a continuation of earlier ones, according to the findings.

Many other studies from other fields have also discovered that there is variation in the pattern of movements and the organisation of steps inside each motion (Ahamad & Yusof, 2012; Ozturk, 2007; Jogthong, 2001; Anthony, 1999). According to Jogthong (2001), RA introductions included all three gestures, with the only exception being in how they were organised. M1–M2 are the most common steps in the reported introductions of computer science RAs. by Anthony (1999) and this study's findings corroborated their findings. Despite this, move 3 was less often seen than moves 1 and 2, and in one introduction it was completely disregarded (code 9). Researchers in the field of civil engineering tended to focus on claiming the topic's significance, drawing broad conclusions, pointing out gaps, and citing relevant prior work in an effort to bolster the validity of their study.

Results from a study on Civil Engineering RA introductions using the CARS model (1990) have important implications for the field of writing pedagogy and for helping ESL/EFL/ESP students improve their reading and writing abilities. Ozturk (2007), Samraj (2002), Bonyadi (2012), and Jogthong (2001) all agree that this may help students organise their RA introductions and pay attention to the pattern that is prominent in the larger field. Purposeful language exercise and critical study of genre may more successfully enhance linguistic awareness (Bronia, 2005). This study's findings may be useful for educators working with English as a foreign language (EFL) and English as a second language (ESL) and students who need to learn more about discourse norms and how to incorporate these concepts into their own lessons (Bonyadi, 2012; Ahamad & Yusof, 2012). Drawing on the findings of this study, instructors of civil engineering courses can better ensure that their students fully grasp the conventions and organisation of research abstracts (RAs) by exposing them to a variety of move-pattern and move step sequences found in RA introductions and having them practice these techniques. They will be inspired and encouraged to submit their work to journals both at home and abroad for publication. It will be useful for both students and instructors when planning lessons and creating course materials.

This research has only looked at the introductions to research articles published in the Civil Engineering and Environmental Journal, which is published by Taylor & Francis. Due to the study's limited scope (15 Civil Engineering research article introductions), its findings may not be applied to other engineering fields. Time restrictions necessitated a qualitative

approach for this research; however, future genre analyses might make use of quantitative and mixed method designs as well.

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