

UNCOVERING THE CAUSES OF ACADEMIC WRITING CHALLENGES AMONG UNDERGRADUATES: A CASE STUDY OF THREE SCIENCE-BASED FACULTIES AT A STATE UNIVERSITY IN SRI LANKA

HMNN Herath¹ and Jayamal de Silva²

Department of Multidisciplinary Studies, Faculty of Technology, University of Ruhuna, Sri Lanka¹

Department of Linguistics, University of Kelaniya, Sri Lanka²

ABSTRACT

Academic writing is a critical skill for university students, especially in science-based disciplines where clarity, precision, and adherence to disciplinary conventions are essential. This study explores the underlying causes of academic writing challenges faced by undergraduates in the Faculties of Technology, Engineering, and Fisheries & Marine Sciences at the University of Ruhuna, Sri Lanka. Drawing on a qualitative case study approach, data was collected through semi-structured interviews, involving both students and lecturers. The research is grounded in Schmidt's Noticing Hypothesis, which emphasizes the importance of conscious awareness in language learning, and Vygotsky's Social Constructivism, which highlights the role of social interaction and scaffolding in skill development. Findings reveal that students' struggles with academic writing are rooted in three interrelated factors: inadequate preparation in secondary education, limited access to targeted resources and support, and the abrupt transition from Sinhala or Tamil medium instruction to English-medium university education. Both students and lecturers identified a lack of exposure to academic writing conventions, insufficient opportunities for individualized feedback, and the absence of discipline-specific writing support as significant barriers. By addressing these challenges through both individual and collaborative approaches, higher education institutions can better equip science undergraduates with the academic writing skills necessary for academic success and professional advancement.

KEYWORDS: *Academic writing challenges, English as a second language, Noticing Hypothesis, Science-based faculties, Social Constructivism*

Corresponding Author: H.M.M.N. Herath, Email: navodanherath@gmail.com



<https://orcid.org/0009-0002-8458-5853>



This is an open-access article licensed under a Creative Commons Attribution 4.0 International License (CC BY) allowing distribution and reproduction in any medium, crediting the original author and source.

1. INTRODUCTION

Academic writing is widely recognized as a cornerstone of higher education, serving as the primary medium through which students demonstrate understanding, engage in scholarly discourse, and develop critical thinking skills (Bailey, 2015; Murray, 2017). Proficiency in academic writing is not merely about effective communication; it encompasses the ability to synthesize information, construct logical arguments, and engage with disciplinary convention skills crucial for academic and professional success. In science-based disciplines, these demands are heightened by the necessity for precision, objectivity, and adherence to specific structural and stylistic norms (Day & Gastel, 2016).

At the University of Ruhuna, located in Sri Lanka's Southern Province, science-based faculties such as Technology, Engineering, and Fisheries & Marine Sciences play a pivotal role in preparing graduates for vital sectors of the national economy. However, students entering these faculties often face a steep transition from secondary education, particularly as many have limited exposure to English—the medium of instruction at the university level.

1.1 Problem Statement

Despite the recognized importance of academic writing, undergraduates in science-based faculties at the University of Ruhuna frequently encounter significant obstacles. These include limited vocabulary and scientific expressions, inadequate prior exposure to English, insufficient resources and guidance, and difficulties in organizing and presenting ideas coherently. Such challenges are especially pronounced for students for whom English is a second language (noting that the large majority of University of Ruhuna students are from ESL backgrounds), often resulting in poor performance in assignments, laboratory reports, and research papers. Notably, these difficulties can lead to diminished academic confidence, lower grades, and, in some cases, increased dropout rates.

While the university has implemented support mechanisms such as writing centres and language workshops, the effectiveness of these interventions in addressing the specific needs of science-based

students remains uncertain. Moreover, there is a paucity of research focusing on the root causes of academic writing challenges within these faculties, particularly in the Sri Lankan context.

1.2 Research Focus

This study seeks to fill this gap by systematically investigating the underlying causes of academic writing challenges faced by undergraduates in three selected science-based faculties at the University of Ruhuna. By identifying these causes, the research aims to inform targeted interventions that can enhance students' academic writing readiness and, by extension, their overall academic success.

1.3 Research Questions

This study is formulated around the main research question.

“What are the possible causes of academic writing challenges faced by undergraduates in the three selected science-based faculties at the University of Ruhuna?”

2. LITERATURE REVIEW

2.1 The Importance of Academic Writing in Higher Education

Academic writing is a fundamental skill in higher education, serving as the primary vehicle for knowledge construction, critical engagement, and scholarly communication (Bailey, 2015; Murray, 2017). Through writing, students demonstrate their understanding, synthesise information from diverse sources, and develop arguments and skills essential for academic achievement and professional success (Paul & Elder, 2006; Facione, 2011). Academic writing also fosters disciplinary socialization, as students internalize the conventions, rhetorical practices, and epistemological values of their chosen fields (Lea & Street, 2006).

2.2 Academic Writing in Science-Based Disciplines

Writing in science-based disciplines presents particular challenges, whilst recognising that academic writing conventions exist across all disciplines with their own specific variations. Students are expected to use technical terminology accurately, present data

objectively, and maintain a neutral tone (Daston & Galison, 2007). Mastery of citation styles (e.g., APA, Harvard) and the use of citation management tools are also essential skills (Modern Language Association, 2021).

For students in non-native English contexts, these requirements are compounded by linguistic barriers and limited prior exposure to scientific discourse in English (Hyland, 2013; Flowerdew, 2015). The transition from secondary education often conducted in the students' first language to university-level scientific writing in English is particularly challenging (Leki, 2007).

2.3 Global Perspectives on Academic Writing Challenges

Across the globe, undergraduate students encounter a variety of obstacles in mastering academic writing, and these challenges are even more pronounced in science-based disciplines. One of the most frequently cited issues is limited language proficiency, particularly for students who are non-native speakers of English. These students often struggle with grammar, vocabulary, and the application of academic style, which can impede their ability to express complex scientific concepts clearly and accurately (Hyland, 2013; Fadda, 2012). In addition to linguistic hurdles, many students lack familiarity with the conventions of academic writing, such as structuring arguments logically, adhering to discipline-specific formats like IMRaD, and employing appropriate citation and referencing practices (Wingate, 2012; Day & Gastel, 2016).

Cognitive and affective barriers also play a significant role. Writing anxiety, low self-confidence, and a fear of negative evaluation can hinder students' willingness to engage deeply with writing tasks, leading to procrastination or avoidance (Pajares, 2003; Lavelle & Bushrow, 2007).

Recent studies also highlight the impact of digital literacy and access to academic resources. Students in well-resourced institutions may benefit from writing centres, online tutorials, and citation management tools, while those in less advantaged contexts often lack such support, widening the gap in academic writing proficiency (Hyland, 2013; Flowerdew, 2015).

Overall, literature underscores that academic writing challenges are multifaceted and shaped by linguistic, cognitive, institutional, and disciplinary factors.

2.4 Regional and Sri Lankan Contexts

In the South Asian region, and particularly in Sri Lanka, the challenges of academic writing are shaped by unique linguistic, educational, and cultural factors. Most Sri Lankan students complete their secondary education in Sinhala or Tamil, with English taught as a second language and rarely used as the medium of instruction. Upon entering university, these students are suddenly required to write complex academic texts in English, often without adequate preparation or exposure to academic genres (Perera, 2010; Wijayasundara, 2017). This abrupt transition creates significant difficulties in comprehension, expression, and the ability to engage with scientific literature at the required level.

Resource constraints further compound these challenges. Many universities in Sri Lanka, including the University of Ruhuna, have limited access to academic writing resources such as writing centres, language labs, and trained writing instructors (Gunawardena & Karunaratne, 2015). Large class sizes and a lack of individualized feedback mean that students receive minimal support in developing their writing skills. Although some institutions have introduced workshops and support programmes, these initiatives are often insufficient to meet the diverse needs of science-based students.

Cultural factors also play a crucial role. The Sri Lankan education system traditionally emphasizes rote memorization and teacher-centred instruction, which does not prepare students for the independent, critical, and analytical writing expected at university (Karunaratne, 2003; De Silva, 2018). Students may be unfamiliar with the argumentative and critical style valued in academic writing, leading to difficulties in constructing and defending scientific arguments. Additionally, there is often a reluctance to question authority or challenge established knowledge, which can limit students' engagement with academic discourse.

Despite these challenges, there is a dearth of research focusing specifically on the causes of academic

writing difficulties in science-based faculties in Sri Lanka. Most existing studies address general writing issues or focus on English language proficiency, without delving into the specific demands of scientific writing or the contextual factors affecting students in these disciplines. This gap highlights the need for targeted research, such as the present study, to better understand and address the underlying causes of academic writing challenges among Sri Lankan undergraduates in science-based faculties.

2.5 Causes of Academic Writing Challenges in Science-Based Faculties

Academic writing challenges among undergraduates in science-based faculties are shaped by a complex interplay of linguistic, educational, institutional, and socio-cultural factors. Based on the findings of this study and supported by the literature, three major causes have emerged as particularly significant: inadequate preparation in secondary education, limited access to resources and support, and the transition from Sinhala/Tamil medium to English medium at the university level.

2.5.1 Inadequate Preparation in Secondary Education

A foundational cause of academic writing difficulties is the insufficient emphasis on academic English and scientific writing during secondary education. In Sri Lanka, the majority of students complete their schooling in Sinhala or Tamil, with English taught primarily as a second language and often focused on basic communication rather than academic or disciplinary literacy (Perera, 2010; Wijayasundara, 2017). As a result, students enter university with limited exposure to the conventions of academic writing, such as organizing ideas logically, synthesizing information from multiple sources, and constructing evidence-based arguments.

Secondary school curricula often prioritize rote memorization and the reproduction of factual knowledge over critical thinking, analytical reasoning, or independent writing (Karunaratne, 2003; De Silva, 2018). Students rarely engage in tasks that require them to write essays, reports, or research papers in English, let alone in the scientific genres demanded by university-level science faculties. Consequently, when

faced with the rigors of academic writing in higher education, students struggle to adapt, lacking both the linguistic tools and the cognitive strategies necessary for success.

2.5.2 Limited Access to Resources and Support

Another critical factor exacerbating academic writing challenges is the limited availability of institutional resources and support mechanisms. While some universities have established writing centres, language labs, or workshops, these facilities are often under-resourced, understaffed, or not tailored to the specific needs of science-based students (Gunawardena & Karunaratne, 2015). Large class sizes and heavy teaching loads further constrain the ability of faculty to provide individualized feedback or targeted writing instruction.

Students frequently report insufficient access to academic writing guides, scientific journals, and citation management tools resources that are essential for mastering the conventions of scientific discourse (Hyland, 2013). The absence of peer-mentoring programmes or structured opportunities for collaborative writing also limits students' ability to learn from one another and to develop their skills through practice and feedback. For many undergraduates, the lack of a supportive academic environment contributes to feelings of isolation, anxiety, and low self-efficacy, which in turn hinder their engagement with writing tasks (Lavelle & Bushrow, 2007; Pajares, 2003).

2.5.3 Transition from Sinhala/Tamil Medium to English Medium

Perhaps the most significant and immediate challenge for undergraduates in science-based faculties is the abrupt transition from learning in Sinhala or Tamil to studying and writing exclusively in English. This shift is not only linguistic but also cognitive and cultural. Students must quickly acquire the ability to comprehend lectures, read scientific literature, and produce written assignments in a language that is often unfamiliar or only partially mastered (Perera, 2010; Wijayasundara, 2017).

This transition imposes a dual burden: students must simultaneously learn new scientific concepts and the

language needed to express them. Many struggles with vocabulary, grammar, and the technical terminology specific to their disciplines (Fadda, 2012; Day & Gastel, 2016). The pressure to perform in English can lead to writing anxiety, reluctance to participate in class, and a tendency to avoid writing-intensive courses or assignments. Furthermore, students may be unfamiliar with the rhetorical conventions and expectations of academic writing in English, such as the need for clarity, objectivity, and appropriate referencing (Wingate, 2012).

The lack of bridging programmes or transitional support exacerbates these difficulties. While some universities offer foundation courses in English, these are often too general or too brief to address the specific demands of scientific writing. As a result, students are left to navigate the complexities of academic writing largely on their own, leading to persistent difficulties and, in some cases, academic underperformance or attrition.

2.5.4 Interconnectedness of Causes

It is important to recognize that these causes are deeply interconnected. Inadequate preparation in secondary education leaves students ill-equipped for the demands of university-level writing; limited access to resources and support prevents them from acquiring the necessary skills once they arrive at university; and the transition to English-medium instruction amplifies both these challenges, creating a cycle of difficulty that is difficult to break without targeted interventions.

2.6 Research Gaps

While the literature provides a comprehensive overview of the challenges faced by undergraduates in academic writing, there is a notable gap in research focusing specifically on science-based faculties in Sri Lanka. Few studies have systematically investigated the underlying causes of these challenges or evaluated the effectiveness of existing support mechanisms in the local context. This study seeks to address this gap by examining the causes of academic writing challenges among undergraduates in three science-based faculties at the University of Ruhuna.

2.7 Theoretical Framework

This study is underpinned by two complementary theories that illuminate the roots and remedies of academic writing challenges in science-based, English as a Second Language (ESL) contexts: Schmidt's Noticing Hypothesis and Vygotsky's Social Constructivism. Together, these frameworks provide a nuanced understanding of how undergraduates in Sri Lankan science faculties confront and potentially overcome the complexities of academic writing in English.

2.7.1 Schmidt's Noticing Hypothesis

Richard Schmidt's Noticing Hypothesis (Schmidt, 1990; 2010) is a foundational concept in second language acquisition. The hypothesis asserts that conscious awareness "noticing" is a prerequisite for converting language input into intake, which is then available for acquisition and productive use. Schmidt distinguishes three aspects of consciousness in language learning: awareness, intention, and knowledge.

- Awareness involves both the surface noticing of language features and a deeper understanding of their function. In the context of academic writing, this means students must first become aware of the specific conventions that distinguish scientific writing such as passive voice, technical vocabulary, and the IMRaD structure before they can internalize and apply them.
- Intention refers to the learner's deliberate efforts to focus on and learn particular language forms. For science undergraduates, this might involve actively seeking out well-written scientific texts, analyzing their features, and consciously attempting to replicate effective structures and styles in their own writing.
- Knowledge is the process of bridging the gap between current proficiency and desired competence. For instance, a student may notice that their own writing lacks the passive constructions prevalent in scientific literature, and, through explicit instruction and practice, begin to incorporate these forms.

In the Sri Lankan science faculty context, the Noticing Hypothesis is particularly relevant because many

students have had limited exposure to academic English and scientific genres prior to university. Without explicit opportunities to notice and analyze the features of effective academic writing, students may continue to rely on informal or non-academic language patterns. The hypothesis thus underscores the importance of instructional strategies that make academic writing conventions visible and salient such as comparing well-written and poorly-written samples, highlighting key features, and providing targeted feedback.

2.7.8 Vygotsky's Social Constructivism

Lev Vygotsky's Social Constructivism (Vygotsky, 1978) provides a complementary sociocultural perspective on learning, emphasizing that knowledge is constructed through social interaction, collaboration, and engagement with cultural tools. In academic writing, this means that students learn not in isolation, but through guided participation in disciplinary communities, scaffolded support from instructors, and dialogue with peers.

Social Constructivism posits that learning is most effective when it occurs within the learner's Zone of Proximal Development (ZPD) the gap between what a learner can do independently and what they can achieve with guidance. In the academic writing classroom, the lecturer acts as a facilitator, providing scaffolding such as modeling, feedback, and collaborative tasks that help students internalize new writing conventions (Moore, 2014; Christie, 2015).

2.8 Synthesis and Application to the Present Study

By integrating the Noticing Hypothesis and Social Constructivism, this study recognizes that academic writing development is both an individual cognitive process and a socially mediated practice. The Noticing Hypothesis explains why explicit attention to the features of academic writing is crucial for ESL learners, while Social Constructivism highlights the value of collaborative learning environments and scaffolded support.

In practical terms, these theories inform both the identification of academic writing challenges and the design of potential interventions. For example, the lack of awareness of scientific writing conventions (as

per Schmidt) and the absence of interactive, supportive learning environments (as per Vygotsky) are both shown in this study to contribute to students' struggles. Addressing these gaps by fostering noticing through explicit instruction and by building collaborative, scaffolded classroom communities can help science-based undergraduates at the University of Ruhuna move toward greater academic writing proficiency.

3. METHODOLOGY

3.1 Research Design

This study employed a qualitative case study approach to investigate the causes of academic writing challenges among undergraduates in three science-based faculties at the University of Ruhuna. The case study method was selected for its strength in providing an in-depth, contextualized understanding of complex phenomena (Yin, 2018). Given the multifaceted and context-dependent nature of academic writing challenges particularly in a non-native English, science-based environment a case study design enabled the exploration of students' lived experiences, perceptions, and the institutional context in detail.

3.2 Research Setting

The research was conducted at the University of Ruhuna, a leading public university in southern Sri Lanka. The focus was on three science-based faculties:

- Faculty of Technology
- Faculty of Engineering
- Faculty of Fisheries and Marine Sciences

These faculties were purposefully selected due to their diverse student populations, the critical importance of academic writing in their curricula, and the prevalence of English as the medium of instruction despite most students' prior education in Sinhala or Tamil.

3.3 Participants

3.3.1 Sampling Technique

A purposive sampling strategy was used to select participants who could provide rich, relevant, and diverse perspectives on academic writing challenges. The sample included:

- Undergraduate students from each of the three faculties
- Academic staff involved in teaching, supervising, or assessing academic writing

3.3.2 Sample Size

- Students: 24 undergraduates (8 from each faculty), ensuring representation across all three faculties.
- Academic staff: 6 lecturers (2 from each faculty, including both subject specialists and language instructors).

3.4 Data Collection Methods

Data were collected through semi-structured interviews using an interview guide developed from the study's objectives and literature review. Open ended questions were used in the interview guide and each interview lasted for about 30 to 45 minutes and interviews were conducted in both Sinhala and English to ensure clarity in responses and comfort in the procedure (subject to the preference of the participant) All interviews were audio recorded with the consent obtained prior to the interview and transcribed later for the analysis.

3.4.1 Semi-Structured Interviews

- Students: Individual interviews explored students' experiences with academic writing, perceived challenges, prior preparation, and use of support resources.
- Academic staff: Interviews focused on their observations of students' writing difficulties, perceived causes, and strategies used to support students.

Each interview lasted 30–45 minutes and was conducted in English or the participant's preferred language (Sinhala/Tamil), then transcribed and translated as necessary.

3.5 Data Analysis

Data was analyzed using thematic analysis (Braun & Clarke, 2006), following these steps:

1. Familiarization: Transcripts and documents were read and re-read to gain an overall sense of the data.
2. Coding: Segments of data relevant to academic writing challenges, causes, and contextual factors were coded.
3. Searching for themes: This process includes analyzing, combining, comparing, and even graphically mapping how codes connect to one another. Inductive analysis allows researchers to develop themes directly from coded data, resulting in themes that are more closely connected to the original data and representative of the entire data set.
4. Reviewing themes: This stage illustrates the overall recursive nature of thematic analysis.
5. Defining and naming themes: After refining the thematic map, the researcher should define and describe each theme, highlighting its relevance to the study question
6. Producing the report/manuscript: The final step involves the writing up of the final analysis and findings.

3.6 Interview Guide

Two separate semi-structured interview guides were developed: one for students, focusing on their personal experiences and challenges in academic writing; and one for lecturers, addressing their observations of student difficulties and the strategies they employ to support students. Both guides were reviewed by experts for clarity and relevance.

According to (Kallio et al., 2016) these five steps can be utilized to create a comprehensive interview guide for a study based on semi-structured interviews.

3.6 Ethical Considerations

- Informed consent was obtained from all participants, with assurances of confidentiality and the right to withdraw at any stage.
- Data was anonymized to protect participants' identities.

3.7 Limitations

- The study focused on three faculties at a single university; findings may not be generalizable to all Sri Lankan universities or disciplines.
- Data was self-reported and may be influenced by participants' willingness to share challenges openly.

4. RESULTS AND DISCUSSION

This objective delves into the underlying causes that contribute to the academic writing challenges experienced by students. Potential causes may include inadequate preparation in secondary education, limited exposure to English language instruction, a lack of access to resources and support services, and transition from Sinhala/Tamil medium to English medium. By exploring these causes, it becomes possible to develop preventative measures and address systemic issues that hinder students' writing development.

To enhance the credibility and depth of these findings, this section integrates both student and lecturer perspectives. In addition to the qualitative data from student interviews, and lecturers from the selected faculties were interviewed and their responses were thematically analyzed using the same coding framework.

A triangulation matrix was developed for systematic cross-validation. For each theme, student and lecturer perspectives are presented side by side, and areas of convergence and divergence are highlighted. This approach strengthens the trustworthiness of the results and provides a more comprehensive understanding of the root causes of academic writing challenges.

Based on Thematic analysis three key themes emerged in this study for possible causes of academic writing challenges.

4.1 Theme 1: Inadequate Preparation in Secondary Education

This theme explores how inadequate preparation during secondary education contributes to the academic writing challenges faced by undergraduate students in science-based faculties at the University of Ruhuna. Secondary education serves as the foundation for higher learning, and deficiencies in its structure

and focus can have long-lasting effects on students' ability to meet the demands of university-level academic writing.

4.1.1 Manifestation of Student's Perspective of Inadequate Preparation in Secondary Education

The challenges arising from inadequate preparation during secondary education are reflected in the following quotes from student interviews:

I. Secondary Education Lack Technical Focus:

Participant S02:

"We were not taught technical writing or similar aspects in our schools. It was just English, so at the university we struggle mastering academic writing as it is totally new for us "

Participant S05:

"I think it is important to focus on academic writing even during the school time, so that we will not find it difficult at the university. Sudden change in the medium and requirements for academic writing make learning really difficult, so schools should teach at least the basics of academic writing"

These highlight how secondary schools fail to introduce students to academic writing conventions required for science-based disciplines.

II. Difficulties in Secondary Education:

Participant S06:

"Secondary schooling was another challenge, especially during A/L time I studied hard only for the core subjects not English, because doing A/Ls in Maths stream is a real challenge."

Participant S10:

"We did not have enough teachers to teach English, we focused only on the other subjects"

These suggest that students face general difficulties during their secondary education that hinder their readiness for university-level tasks.

III. Secondary Education does not Emphasize Academic Writing:

Participant S03:

"It was not an emphasis to learn more regarding academic writing from school."

Participant S06:

"I heard about academic writing only when I came to the university."

These indicate a lack of focus on teaching academic writing skills during secondary education.

IV. Unfamiliar Research Methods:

Participant S04:

"This difficulty is mainly due to inadequate preparation during the school. However, we cannot criticize school system because research writing and these complex assignments were not part of the school syllabus"

Participant S09:

"We did not want Academic Writing at the schools, just General English was enough."

These reflect how limited exposure to research methodologies during secondary education creates challenges for students at the university level.

4.1.2 Manifestation of Lecturer's Perspective of Inadequate Preparation in Secondary Education

Participant L7:

"Many students come to university without any exposure to academic writing. The school curriculum does not prepare them for the expectations at tertiary level."

Participant L9:

"The transition from general English to academic writing is a significant leap for most first-year students."

Both students and lecturers agree that inadequate exposure to academic writing in school is a major cause. These findings align with the **Noticing Hypothesis**: students arrive at university without having "noticed" or internalized the conventions of academic writing, making it difficult to bridge the gap between prior knowledge and university expectations (Schmidt, 2010). The results also echo literature highlighting the inadequacy of secondary education in

preparing Sri Lankan students for academic writing in English (Perera, 2010; Karunaratne, 2003).

4.2 Theme 2: Limited Access to Resources and Support

This theme explores how academic writing challenges faced by undergraduate students in science-based faculties at the university of Ruhuna arising from limited access to resources and support, which emerged as a significant theme influencing their academic writing abilities. The analysis revealed that a lack of sufficient resources and support systems exacerbates existing difficulties and hinders undergraduates' progress in developing essential academic writing skills.

4.2.1 Manifestation of Students' Perspective Limited Access to Resources and Support

Challenges also arise due to the limited access to resources and support and the quotes given below provide more nuanced insights into the challenges faced by students due to limited access to resources and support.

- I. Insufficient availability of faculty members or teaching assistants to provide personalized feedback and support on writing assignments:
Limited Staff Guidance

Participant S08:

"Less support and contribution we get from lecturers is a huge problem. We don't always know if we're on the right track, and it's hard to get individual help when you need it."

Participant S14:

"We write so many assignments and lab reports daily, but we don't get any feedback to them, we actually don't know whether they are correct or wrong. Demonstrators and temporary lecturers are not enough. Even though they are there they don't give any feedback."

These quotes highlight the importance of personalized guidance from instructors and the difficulties students face when such support is lacking.

- II. Lack of access to necessary software, online databases, or writing tools that can aid in

research, citation management, and the overall writing process: Limited Academic Writing Tools

Participant 09:

"Lack of access to many things really halted my progress."

Participant 17:

"Practicing tools are not there at the university, many of the things are to be purchased, if they were there, we can practice writing individually."

These show the impact of not having access to writing software or tools for academic purposes.

III. A scarcity of relevant books, journals, and other academic materials that students can use to inform their writing and broaden their understanding of subject matter: More Material Access

Participant S06:

"I wish there was more access to materials, as I'm struggling with the content and the way that I am writing"

Participant S10:

"We don't have access to reputed journals and certain online resources, if students have free access to these it will be really useful for them."

These quotes underscore the importance of readily available resources, like books and journals, for students to grasp complex concepts and improve their writing.

IV. Not enough feedback on academic writing tasks and research to help students improve their writing skills: Lack of Feedback for Writing

Participant S01:

"I don't get feedback from lecturers for my assignments, sometimes I go to them in person and ask for the feedback, however, we get the comment only regarding the subject matter not language skills."

Participant S07:

"I believe feedback is also equally important than just giving the grade, then only we can correct our mistakes and go forward."

The statements reflect how the environment itself does not much help undergraduates learn more about academic writing or improve their writing skills through feedback.

4.2.2 Manifestation of Lecturer's Perspective Limited Access to Resources and Support

Participant L3:

"Due to large class sizes, it is difficult to provide personalized feedback to every student. Many students do not seek help even when support is available."

Participant L8:

"There is a lack of academic writing resources and workshops. Time constraints and staffing shortages limit our ability to offer additional support."

Both groups highlight lack of feedback, resources, and support as key causes. Lecturers also pointed out the absence of structured peer review or mentoring programs, which could facilitate collaborative learning and the social construction of writing knowledge (Vygotsky, 1978).

The lack of tailored resources and support impedes both the "noticing" of academic conventions and the social constructivist processes necessary for writing development. These findings are consistent with previous studies (Gunawardena & Karunaratne, 2015) and underscore the need for faculty-specific writing support and more interactive, scaffolded learning environments.

4.3 Theme 3: Transition from Sinhala/Tamil Medium to English Medium

This theme explores the academic challenges faced by undergraduate students in science-based faculties arising from the transition from Sinhala/Tamil medium education to English medium instruction in university, which emerged as a significant theme influencing undergraduates' academic writing abilities. The analysis revealed that this transition presents unique difficulties that can hinder students' progress in developing essential academic writing skills.

4.3.1 Manifestation of Students' Perspective Transition from Sinhala/Tamil Medium to English Medium

The challenges arising from the transition from Sinhala/Tamil medium to English medium are reflected in the following quotes from student interviews:

- I. Students have an unfavorable experience when changing from their native language medium to English medium: Negative Transition

Participant S02:

"Transitioning from Sinhala to English medium at the university was a shocking experience to me during the first year, because my English language skills were not that good"

Participant S05:

"I really wanted to leave the university due to English medium instruction"

These quotes highlight the difficulties and frustrations undergraduates face when transitioning to English medium instruction.

- II. Insufficient English language skills or exposure before entering university: Limited Prior Background

Participant S07:

"I did not get proper exposure to English language during my school time, so changing to English medium was a real struggle for me, also I did not understand Sinhala first, so the trouble was double for me."

Participant S10:

"We do not talk in English even in school or at home, so the load when entered to the university was too difficult to bear."

These quotes show the difficultness of switching from learning in Sinhala or Tamil to learning in English.

- III. Switching to English as the primary language of instruction poses a significant hurdle: English is Huge Change

Participant S04:

"If I knew my English, things would make a big difference, and I would score much better"

Participant S11:

"Although my subject knowledge was good, I found it really difficult to express myself in English especially during the first two years at the university."

These quotes underscore the importance of English proficiency for academic success and the challenges students face when they lack sufficient English language skills.

4.3.2 Manifestation of Lecturer's Perspective: Transition from Sinhala/Tamil Medium to English Medium

Participant L5:

"The shift from mother tongue to English medium is a significant barrier. Many students struggle to understand lectures and express themselves in writing."

Participant L9:

"Students who studied in Sinhala or Tamil medium face greater difficulties in academic writing, especially in technical subjects."

Both students and lecturers see the language medium transition as a major obstacle. These quotes collectively reveal the multifaceted nature of the challenges students face due to transitioning to English medium instruction. This theme highlights the dual challenge of mastering both scientific content and the language of academic writing. According to the Noticing Hypothesis, students may not be aware of the specific linguistic features required in scientific writing, while Social Constructivism emphasizes the need for supportive, interactive environments to facilitate this transition. The findings reinforce literature on the difficulties faced by ESL students in English-medium universities (Hyland, 2013; Wijayasundara, 2017). They highlight the need for institutions to provide targeted support and interventions to help students navigate this transition successfully. The theme of transitioning from Sinhala/Tamil medium to English medium emerged as a critical factor contributing to academic writing

challenges among undergraduate students at the University of Ruhuna.

Table 1: Triangulation Matrix: Cross-Validation of Student and Lecturer Perspectives on Causes of Academic Writing Challenges

Appendix: A

4.4.1 Areas of Convergence

Both students and lecturers agree on the central challenges: inadequate prior preparation, insufficient tailored support, and the daunting transition to English-medium scientific writing.

4.5 Integrative Discussion

The cross-validated findings underscore that academic writing challenges in science-based faculties at the University of Ruhuna are deeply rooted in systemic issues spanning educational, linguistic, and institutional domains. The results support and extend the Noticing Hypothesis (Schmidt, 2010), demonstrating that students' lack of awareness and explicit instruction in academic writing conventions impedes their development. At the same time, the findings affirm the value of Social Constructivism (Vygotsky, 1978): students benefit from collaborative, scaffolded learning environments, yet such opportunities are currently limited.

These results are consistent with broader research in Sri Lanka and similar contexts (Perera, 2010; Gunawardena & Karunaratne, 2015; Hyland, 2013) but also highlight unique challenges in science-based disciplines, where technical accuracy, objectivity, and specialised vocabulary are paramount.

4.6 Implications

- **Curriculum Reform:** There is a need for secondary education curricula to integrate academic writing and scientific genres, not just general English.
- **Faculty-Specific Support:** Universities should develop tailored writing support for science-based students, including workshops, peer mentoring, and access to discipline-specific resources.

- **Transitional Programs:** Bridging courses and scaffolded support in the first year can ease the shift to English-medium academic writing.

Holistic Interventions: Addressing both the cognitive (awareness, noticing) and social (collaboration, feedback) aspects of writing development is essential.

5. CONCLUSION

This research has illuminated the core reasons why undergraduates in science-based faculties at the University of Ruhuna often struggle with academic writing. Through a careful analysis of student and lecturer experiences, it became clear that the roots of these challenges are deeply embedded in students' earlier educational experiences, the resources available to them, and the significant language shift they encounter upon entering university.

A major finding is that many students arrive at university without a strong foundation in academic writing, as their secondary education has not adequately prepared them for the demands of scientific communication in English. This gap is exacerbated by the lack of access to writing support services and resources, especially catering to the requirements of the undergraduates from science-based faculties. Further, the medium of instruction is a critical element due to the sudden change that students have to undergo when they transition from secondary education to university education. This abrupt change, particularly from Sinhala/Tamil medium to English medium, often leads to feelings of anxiety and reduced confidence levels.

The use of tenants in noticing hypothesis by Richard Schmidt and social constructivism by Lev Vygotsky confirm that learning academic writing is not merely getting to know academic communication, but a serious and conscious effort where learning is further induced by an active process along with conscious awareness of features of language. Conversely, student learning is jeopardized and hindered when they are not given individualized feedback and are devoid of sufficient opportunities for the noticing of conventions in academic writing.

In brief, this study is intended to provide a comprehensive understanding of academic writing

challenges experienced by undergraduates in science-based faculties. The study driven by a triangulated approach via qualitative insights and cross validated facts offers practical and feasible insights for educators and policymakers on the future direction of academic writing.

6. REFERENCES

- Bailey, S. (2015) *Academic writing: A handbook for international students*. 4th ed. Routledge.
- Boud, D. and Falchikov, N. (2007) *Assessment and student learning: New directions for teaching and learning*. Jossey-Bass.
- Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, 3(2), pp. 77–101. <https://doi.org/10.1191/1478088706qp063oa>
- Christie, F. (2015) *Language education throughout the school years: A functional perspective*. Wiley.
- Cummins, J. (2000) *Language, power and pedagogy: Bilingual children in the crossfire*. Multilingual Matters.
- Daston, L. and Galison, P. (2007) *Objectivity*. Zone Books.
- Day, R.A. and Gastel, B. (2016) *How to write and publish a scientific paper*. 8th ed. Cambridge University Press.
- Fadda, H.A. (2012) 'Difficulties in academic writing: From the perspective of King Saud University postgraduate students', *English Language Teaching*, 5(3), pp. 123–130. <https://doi.org/10.5539/elt.v5n3p123>
- Facione, P.A. (2011) *Critical thinking: What it is and why it counts (2011 update)*. Insight Assessment.
- Giesen, J. (2018) 'Social constructivism: Concepts and evidence', in *Theories in second language acquisition*. Routledge, pp. 123–138.
- Gunawardena, C. and Karunaratne, I. (2015) 'English for academic purposes: Challenges and solutions in Sri Lankan universities', *Journal of University Teaching & Learning Practice*, 12(2), pp. 1–15.
- Hyland, K. (2013) 'Writing in the university: Education, knowledge and reputation', *Language Teaching*, 46(1), pp. 53–70. <https://doi.org/10.1017/S0261444811000036>
- Karunaratne, I. (2003) 'Teaching English in urban Sri Lanka: Some pedagogical issues', *English Today*, 19(4), pp. 29–34. <https://doi.org/10.1017/S0266078403004083>
- Lawson, A.E. (2009) 'What is the role of induction and deduction in reasoning and scientific inquiry?', *Journal of Research in Science Teaching*, 46(4), pp. 406–418. <https://doi.org/10.1002/tea.20282>
- Lea, M.R. and Street, B.V. (2006) 'The "academic literacies" model: Theory and applications', *Theory into Practice*, 45(4), pp. 368–377. https://doi.org/10.1207/s15430421tip4504_11
- Leki, I. (2007) *Undergraduates in a second language: Challenges and complexities of academic literacy development*. Lawrence Erlbaum.
- Meltem, Y. (2017) 'Social constructivism and the teaching of academic writing', *Journal of Education and Learning*, 6(2), pp. 123–130. <https://doi.org/10.5539/jel.v6n2p123>
- Modern Language Association. (2021) *MLA handbook*. 9th ed. Modern Language Association of America.
- Moore, A. (2014) 'The role of scaffolding in constructivist learning', *International Journal of Educational Research*, 62, pp. 1–10. <https://doi.org/10.1016/j.ijer.2013.06.009>
- Murray, N. and Moore, S. (2006) *The handbook of academic writing: A fresh approach*. Open University Press.
- Murray, R. (2017) *Writing in social spaces: A social processes approach to academic writing*. Routledge.
- Pajares, F. (2003) 'Self-efficacy beliefs, motivation, and achievement in writing: A review of the literature', *Reading & Writing Quarterly*, 19(2), pp. 139–158. <https://doi.org/10.1080/10573560308222>

Parkinson, J., Jackson, L., Kirkwood, T. and Padayachee, V. (2017) 'A scaffolded approach to teaching writing in the sciences', *Teaching in Higher Education*, 22(3), pp. 319–331. <https://doi.org/10.1080/13562517.2016.1248382>

Paul, R. and Elder, L. (2006) *Critical thinking: Tools for taking charge of your learning and your life*. 2nd ed. Pearson.

Perera, N. (2010) 'English language proficiency and academic performance: A study of undergraduates at the University of Colombo', *Sri Lanka Journal of Social Sciences*, 33(1–2), pp. 23–34. <https://doi.org/10.4038/sljss.v33i1-2.2492>

Schmidt, R. (1990) 'The role of consciousness in second language learning', *Applied Linguistics*, 11(2), pp. 129–158. <https://doi.org/10.1093/applin/11.2.129>

Schmidt, R. (2010) 'Attention, awareness, and individual differences in language learning', in Chan, W.M. et al. (eds.) *Perspectives on individual characteristics and foreign language education*. Walter de Gruyter, pp. 27–50.

Vygotsky, L.S. (1978) *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wijayasundara, N.D. (2017) 'Challenges faced by undergraduates in academic writing: A study at the University of Kelaniya', *Proceedings of the International Postgraduate Research Conference 2017*, pp. 1–8.

Wingate, U. (2012) 'Using academic literacies and genre-based models for academic writing instruction: A "literacy" journey', *Journal of English for Academic Purposes*, 11(1), pp. 26–37. <https://doi.org/10.1016/j.jeap.2011.11.006>

Yin, R.K. (2018) *Case study research and applications: Design and methods*. 6th ed. Sage.