

COMPARATIVE ERROR ANALYSIS OF L2 WRITING ACROSS DIFFERENT ACADEMIC DISCIPLINES: ARTS VS. SCIENCE STUDENTS IN PAKISTANI UNIVERSITIES

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Abstract:

This research paper examines disciplinary variation in L2 writing errors by looking at Pakistani students at the university by comparing cohorts of Arts and Science scribes. Data were obtained via a comparative error analysis design on 100 randomly selected undergraduate students (50 from Arts and 50 from Science) who were made to complete a set of controlled essay tasks based on specific topics. Manual identification of errors was divided into 16 types on the grammatical and structural errors following the International Corpus of Learner English (ICLE) framework, and these errors were tagged by using a hybrid method consisting of both GPT-03 Mini automated tagging and researcher verification. The quantitative analysis corrected the number of errors per student and the qualitative one discussed the nature of an error, its potential causes, and its setting among disciplines. Findings indicated that the two groups had four categories of errors that occurred at high frequency: Noun, Form, Punctuation, and Article thus indicating common systemic difficulties probably that can be attributed to L1 interference and deficient in basic knowledge on grammatical rules. But there were disciplinary variations: Articles, Nouns and Auxiliary Verbs errors were much more prevalent among Science students, and Form and Punctuation errors were a touch more common among Arts students, consistent with scientific and humanities styles of writing. These results suggest the necessity to introduce English as Academic Purposes (EAP) interventions that interacts with core grammar support and discipline training since the particulars of rhetorical and structural directives of academic writing in the field of arts and science in Pakistan in higher education context require addressing.

Keywords

L2 writing, error analysis, academic writing, disciplinary variation, Arts students, Science students, Universities, second-language acquisition, grammar errors.

1. Introduction:

Writing may be considered the most challenging ability in Second Language Acquisition (SLA) because it not only entails correctness in grammar, but also integration, coherence, and compliance to academic standards (Hyland, 2003; Silva, 1993). In Pakistan, although English is used as the

language of higher learning, it is observed that students often have difficulties in academic writing because they have little exposure, teaching is based on rote learning, and there is interference caused by Urdu or regional languages (Rahman, 2002; Khan, 2015). Such difficulties are expressed in the form of consistent mistakes at the level of both the surface and discourse (such as, grammar, cohesion, and argumentation) (Mahmood & Tariq, 2016). Error Analysis (Corder, 1967; Ellis, 1994) also offers a convenient means of analyzing such problems by determining regularities and origins of the problems. Nevertheless, L2 writing has been regarded by most researchers as a generic skill and disciplinary variation has been ignored in Pakistan. However, academic writing varies with each discipline; Arts subjects focus on meaning and difficulty of contentions, whereas Sciences focus on the brevity, clarity and technicality (Swales, 1990; Hyland, 2009). The differences will imply that students of each discipline might encounter unique language issues and problems of language usage.

The study is significant because it highlights the disciplinary aspect of ESL writing problems in the Pakistani tertiary institutions. Comparing error patterns of Arts and Science, it presents how the disciplinary contexts determine linguistic and rhetorical dilemma. The results will give evidences on how to develop discipline-sensitive instruction to enable the learning of educators to learn how to solve intractable problems. The targeted class improvement helps students improve their grades and attitude and improves their chances in the workplace.

Research Questions:

1. What are the most frequent categories of grammatical errors in the academic English writing of students in the arts disciplines?
2. What are the most frequent categories of grammatical errors in the academic English writing of students in the science disciplines?

2. Literature Review:

2.1. Studies on Second Language Writing Challenges

There is a common attitude that L2 writing is the most challenging contribution to SLA since all the appropriate linguistic and cognitive and sociocultural competencies must be ensured without a feedback that is apparent in a conversation (Hyland, 2003). Studies point to issues with grammar, vocabulary, cohesion and organization that are common (Silva, 1993; Ellis, 1994). L1 interference leads to the occurrence of many errors- including article misuse, inconsistent use of tenses and restricted cohesive devices (James, 1998; Ferris, 2011). In addition to grammar, the students should comply with disciplinary expectations of argument, synthesis, and citation (Hyland, 2009; Wingate, 2012). In Pakistan, there are additional barriers to this: poor teaching of academic English and repetitive learning at school mean that students are ill-equipped to cope with the requirements of higher education writing (Rahman, 2002; Khan, 2015; Mahmood & Tariq, 2016).

2.2. Error Analysis in L2 Writing:

Error Analysis (EA) developed by Corder (1967) considers errors to be innovative measures instead of losses (Ellis, 1994). Research also indicates that there are consistent problems about the articles, tense, agreement and verb order (James, 1998; Ferris, 2011). These errors tend to be: (1) interlingual, the result of L1 transfers; (2) intralingual, the result of incomplete rules knowledge; or (3) context specific, tied to your discourse conventions (Ellis, 1994). The less proficient learners tend to commit more numerous superficial errors as opposed to more advanced learners who may have problems with cohesion and argumentation (Ferris, 2011). Article, use of tone, and prepositions are issues frequently raised in Pakistan and this is usually related to the lack of writing instruction (Khan, 2015; Mahmood & Tariq, 2016). EA is therefore a diagnostic, pedagogical tool.

2.3. Disciplinary Differences in Writing:

The writing in academia passes through the perspective of varying fields, dictated by genres and rhetorical conventions (Swales, 1990; Biber, 2006). Arts focus on interpretation and argumentation which reflects the sophisticated syntax and evaluation language (Hyland, 2009, Wingate, 2012), and Sciences need clarity, concise, technical refinement and passive structures (Swales, 1990; Biber, 2006). The Pakistani research supports this finding by adding that Arts students would encounter complications with unifying and intricate formations, whereas Science students would have issues with technical terminologies and passive construction (Khan, 2015; Mahmood & Tariq, 2016). These gaps are further increased by lack of discipline-specific training (Lea & Street, 1998).

2.4. Theoretical Frameworks: Genre and Interlanguage Theory

This study integrates Genre Theory (Swales, 1990; Biber, 2006) that locates writing in acts of disciplinary convention and Interlanguage Theory (Selinker, 1972; Ellis, 1994) which conceives L2 as a changing system governed by both language transfer and development. Collectively, they enable one to examine social and linguistic features of student errors providing a clue to discipline-sensitive pedagogy.

2.5. Research Gap:

The disciplinary disparities of Pakistani ESL learners are understudied, even though the pattern of their errors is well-documented (Khan, 2015; Mahmood & Tariq, 2016). This paper fills that gap by comparing writing errors in Arts and Science with an objective of providing specific instructions, field-related to the Pakistani university.

3. Methodology:

3.1. Research Design:

This study used a comparative error analysis design to investigate writing errors made by Pakistani university students in terms of L2 academic writing. The aim was to identify, categorize, and compare the most frequent types of grammatical and structural errors found in academic writing between students from the Arts and Science disciplines. A mixed-method approach was adopted whereby quantitative analysis (error frequency) and qualitative analysis (error types and nature) were combined for comprehensive understanding of L2 writing errors.

3.2. Participants:

The sample consisted of 100 Pakistani university students, divided into two distinct sub- groups:

- Arts Group (N = 50): Students in Arts in subjects like English, Urdu, and History.
- Science Group (N = 50): Students in Science in subjects like Physics, Chemistry, and Computer Science.

After the existing database of 500 university students was taken into consideration, it was decided to select the participants based on their faculties (Arts or Science). All were undergraduate students with varying levels of English proficiency. The students were all non-native speakers of English; first languages were Urdu and local languages. Writing in English of the participants was assessed through their written assignments (essays, reports, and other academic texts).

3.3. Data Collection:

Data collection included a structured writing task in order to assess students according to their English writing skills. Eleven different essay titles were given to the participants for which they had to pick one and write their response. A writing task was administered under controlled classroom circumstances. The classroom setup contained fixed time limits for the writer to maintain uniformity of the treatment.

Afterward, the students sent pictures of their essays with handwritten responses via email. They were also given a form to enter information concerning name, gender, academic discipline, and mother tongue.

Essays with fewer than 200 words were eliminated in the hope of their presenting content with quality and depth. Further, those with their content clothed by or initiated from the assistance of artificial intelligence such as ChatGPT were discarded. This hard filtering truly gave credence to data authenticity and reliability.

3.4. Error Categorization:

Some sixteen basic grammatical and structural error categories were developed for analysis, accounting for the most common ones in L2 writing. These were:

1. Noun (pluralization, possessive)
2. Form (e.g., tense, spelling, capitalization)
3. Punctuation (e.g., commas, periods, quotation marks)
4. Article (missing or incorrect use of "a," "an," or "the")
5. Preposition (incorrect use or omission)
6. Lexical verb (wrong verb choice)
7. Adverb (wrong placement, form)
8. Pronoun (wrong use of pronouns)
9. Auxiliary verb (auxiliary verbs are mistaken, omitted)
10. Adjective (wrong use or form)
11. Conjunction (missing or incorrect conjunctions)
12. Particle (errors involving phrasal verbs)
13. Proform (e.g., errors with pronouns like "this," "that," etc.)
14. Existential there (errors in using "there is/are")
15. Miscellaneous (e.g., errors that do not fit into other categories)
16. Numeral (e.g., misuse of numbers or quantity words)

Once the essays were reviewed manually, all the errors were detected and listed according to the above-mentioned categories. It was essential that this classification of errors be undertaken according to a rubric that had been developed beforehand; hence, the researcher had ensured that consistency would be followed in classifying errors.

3.5. Data Analysis:

The analysis of the error data was carried out combining the quantitative, qualitative and comparative approaches.

Quantitative analysis consisted of the summing of errors in each category, and averaging them within an Arts and Science group, and comparing the frequencies between categories. Characteristic statistics (statistical mean figures and frequency counts) were used in order to determine which errors were the most common.

Qualitative analysis was used to analyze a few examples in each error category, so as to understand their nature and cause. Errors were viewed in terms of L1 (Urdu) influence, language-learning factors to L2, and disciplinary writing practices.

Comparative analysis was conducted on similarities and differences in the error-types and frequencies between the Arts and the Science students with respect to how disciplinary requirements impact the writing difficulties in L2 academic settings.

3.6. Tagging of Data Using ICLE Framework and GPT-03 Mini High Model

For tagging errors in the essays, the International Corpus of Learner English (ICLE) has been used as a reference tool for classifying and labeling the errors in student writings. The ICLE system is a very organized system for classifying different types of grammatical, lexical, and structural errors usually found in L2 writing.

To make the tagging process more precise and quicker, the GPT-03 Mini high model was used to tag the errors automatically given a set of categories. Trained on a big annotated set of L2 writing, the model learned to identify patterns in L2 student writing and assign probable error tags accordingly. This GPT-03 Mini high model was fed with essays and was tasked initially to tag errors in an automated way, where after, the results were verified manually and, if needed, corrected and homogenized.

The identification and categorization of errors needed to have been done accurately and comprehensively; hence the hybrid approach involving manual tagging along with AI-assisted tagging was implemented during the study. Once tagging took place, the results were brought forth for analysis and comparison.

4. Analysis:

This study intends to carry out a detailed comparative analysis of errors committed by Pakistani university students in English writing due to two general academic streams: Arts and Science. The major goal is to identify and interpret the distinct patterns, frequencies, and types of errors typical of each group; this will contribute toward an enhanced understanding of the issues confronted in writing within different disciplinary backgrounds.

The results are based on essays of 100 students divided into two sub-corpora of 50 students each: 50 in arts subjects (Urdu, English, and History); and 50 in science subjects (Physics, Chemistry, and Computer Science). The samples are selected from a big dataset of 500 Pakistani university students. Next follows a quantitative study in which the total frequency and average errors on 16 predetermined categories of grammar and structure were calculated for each group. Complementary to this quantitative data is a qualitative study of a selection of errors to demonstrate the nature of the difficulties encountered by each group.

To present the finding systematically, this analysis will be structured as follows. It will first expound on the error profile for students in arts disciplines with quantitative data and qualitative examples. An identical analysis for the science students will then follow. After the individual profiles, a direct comparative analysis will shed light on the principal similarities and differences between the two groups. The chapter will conclude with a discussion of the findings, considering potential reasons for the patterned relations and pedagogic implications for English language teaching in Pakistani higher education.

4.1.Error Profile of Arts Students

The original analysis focused on establishing the frequency and distribution of writing errors among the 50 students from arts disciplines. This gives a baseline view of the main grammatical and structural challenges faced by this group.

4.1.1. Quantitative Overview of Error Frequencies

The general distribution of writing errors for the 50 arts students is presented in Table 4.1. The table shows total errors and the mean error per student for each of the 16 categories, ranked from most frequent to least frequent.

Table 4.1

Frequency and Mean of Errors for Arts Students (N = 50)

Sr. no.	Error Category	Total Errors	Mean Errors
1.	NOUN	294	5.88
2.	Form	272	5.44
3.	Punctuation	251	5.02
4.	Article	234	4.68
5.	Preposition	165	3.3
6.	Lexical verb	93	1.86
7.	Adverb	72	1.44
8.	Pronoun	69	1.38
9.	Auxiliary Verb	69	1.38
10.	Adjective	66	1.32
11.	Conjunction	55	1.1
12.	Particle	53	1.06
13.	Proform	20	0.4
14.	Existential there	19	0.38
15.	Miscellaneous	11	0.22
16.	Numeral	7	0.14

As shown in Table 4.1, the most common error categories for arts students are Noun (Mean = 5.88), Form (M = 5.44), Punctuation (M = 5.02), and Article (M = 4.68), and these four are indeed the most problematic categories for this population. On the contrary, such categories as Numeral (M = 0.14), Miscellaneous (M = 0.22), and Existential there (M = 0.38) occur more rarely.

4.1.2. Qualitative Analysis of Prominent Error Categories

To study the nature of these frequently-occurring errors, a qualitative analysis of the most commonly found categories was made.

4.1.2.1. Noun Errors.

This noun category stands out as the most common. Perhaps because these noun errors are the more common ones for arts students, students experience difficulty with either noun usage, form, or agreement in their writing. The rather high frequency of errors in this particular class may be indicative of specific challenges peculiar to understanding or applying noun rules in general. The following are examples of these errors in Table 4.2.

Table 4.2

Examples of Noun Errors among Arts Students

Input Text	Error Sub-Type	Justification	Correction

...enjoying present without giving thought to future.	Noun Usage Error	Missing definite articles before the nouns 'present' and 'future'.	...enjoying the present without giving thought to the future.
Not the Government responsibility.	Possessive Form Error	The phrase lacks a possessive apostrophe to indicate that it is the government's.	Government's responsibility.
Many government are not caring these people.	Plural Form	The countable noun "government" is used with the quantifier "Many" but remains singular.	Many governments...
...one of the most important contribution of modern technology.	Plural Form	After 'one of the', the noun must be plural to agree with the construction.	...one of the most important contributions...
...oblivious to their part culture...	Noun Usage Error	The noun 'part' is incorrectly used instead of the intended noun 'past', disrupting meaning.	...oblivious to their past culture...

4.1.2.2. Form Errors

Next in line come the so-called Form Errors, which are related mostly to aspects of word formation, such as tense, number, spelling, and capitalization. A high count of such errors signals a probable area of weakness in the students' understanding of language structure.

Table 4.3

Examples of Form Errors among Arts Students

Input Text	Error Sub-Type	Justification	Correction
basic information helps customer...	Capitalization	Sentence starts with lowercase 'basic' instead of 'Basic'.	Basic information...
Social media effected many students life.	Spelling	The word 'effcted' is misspelled instead of 'affected'.	Social media affected...
social media spreads fale information... bad habbits.	Spelling & Capitalization	The sentence begins with lowercase 'social'; 'fale' and 'habbits' are misspelled.	Social media spreads false information... bad habits.

4.1.2.3. Punctuation Errors

Other errors concern punctuation, thus making this category an important category. Punctuation errors are the most frequent error-type, thus suggesting that most students are prone to incorrect punctuation usage. Punctuation marks are vital for clarity and coherence in academic writing, as an incorrectly punctuated sentence can misrepresent ideas and thus hinder communication.

Table 4.4

Examples of Punctuation Errors among Arts Students

Input Text	Error Sub-Type	Justification	Correction
On the other hand advertising have positive impact...	Missing Punctuation	Missing comma after the introductory phrase 'On the other hand'.	On the other hand, advertising...
Because, of air is the of are st of is spread...	Confused Punctuation	Incorrect comma after 'Because,': introductory 'Because' should not be followed by a comma.	Because of air...
...buy happiness, but it can buy freedom .	Confused Punctuation	A comma is used without a following space, and there is an extra space before the period.	...buy happiness, but it can buy freedom.

4.1.2.4. Article Errors.

Article errors stand out as a common error. This perhaps relates to to the correct use of definite and indefinite articles, which non-native English speakers often find very difficult to master, especially in more complex sentence structures.

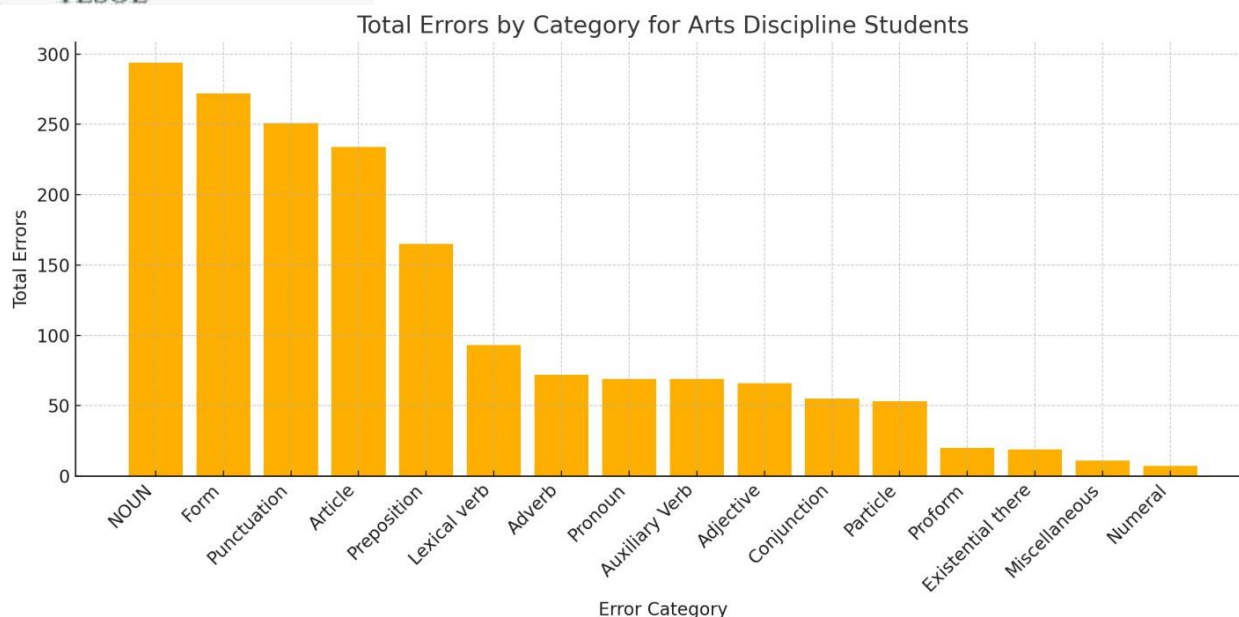
Table 4.5

Examples of Article Errors among Arts Students

Input Text	Error Sub-Type	Justification	Correction
whole world work under the science.	Definite Article	Missing definite article 'the' before 'whole world' and unnecessary 'the' before 'science'.	The whole world works under science.
It is source of happiness.	Indefinite Article	The noun 'source' is a singular, countable noun and requires an indefinite article 'a'.	It is a source of happiness.
...sharing anything on the social media.	Definite Article	Unnecessary definite article 'the' before the uncountable noun 'social media'.	...sharing anything on social media.

4.1.2.5. Moderate and Rarely Occurring Errors

Other error categories including Preposition (M = 3.3), Lexical Verb (M = 1.86), and Adverb (M = 1.44) show great frequencies of errors. The likes of Adjective, Pronoun, and Auxiliary Verb reflect average frequencies. Preform, Existential There, Miscellaneous, and Numeral are fastidious ones with minimal errors, suggesting that they pose only a slight problem for most arts students.



4.2. Error Profile of Science Students

Again, the analysis was performed for the 50 science students in order to establish their specific error profile.

4.2.1. Quantitative Overview of Error Frequencies

The global distribution of writing errors for the 50 students belonging to science disciplines is presented in Table 4.6.

Table 4.6

Frequency and Mean of Errors for Science Students (N = 50)

Sr. no.	Error Category	Total Errors	Mean Errors
1.	Noun	325	6.50
2.	Article	278	5.56
3.	Form	271	5.42
4.	Punctuation	244	4.88
5.	Preposition	178	3.56
6.	Auxiliary Verb	104	2.08
7.	Lexical Verb	93	1.86
8.	Pronoun	73	1.46
9.	Conjunction	70	1.40
10.	Adjective	61	1.22
11.	Adverb	60	1.20
12.	Particle	41	0.82
13.	Miscellaneous	20	0.40
14.	Existential There	14	0.28
15.	Proform	11	0.22

16.	Numeral	3	0.16
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For science students, Noun errors remain the most common type, with an error mean of 6.50. Next, we have Article errors with an M of 5.56, followed by Form errors (M = 5.42) and Punctuation errors (M = 4.88). A similar, yet not identical, pattern of highest fields of errors may thus be given for arts students.

4.2.2. Qualitative Analysis of Big Error Classifications

Here are some examples from among the errors most commonly made by the science students.

4.2.2.1. Noun Errors.

Noun errors are a big issue for science students, perhaps because nouns are a difficult aspect of use in scientific contexts.

Table 4.7

Examples of Noun Errors among Science Students

Input Text	Error Sub-Type	Justification	Correction
...when a children would be punished...	Noun Usage Error	'children' is plural but incorrectly preceded by the singular article 'a'.	...when a child would be punished...
Social media makes a pivotal role in our life.	Plural Form Error	The noun 'life' should be plural 'lives' to refer to multiple individuals.	...pivotal role in our lives.
...great opportunity for online shopping lover's.	Possessive Form Error	The noun 'lover's' is incorrectly used in possessive form instead of plural; it should be 'lovers'.	...online shopping lovers.

4.2.2.2. Article Errors

Problems with article use present a significant challenge for these students of science and are the second most common type of error found in their language.

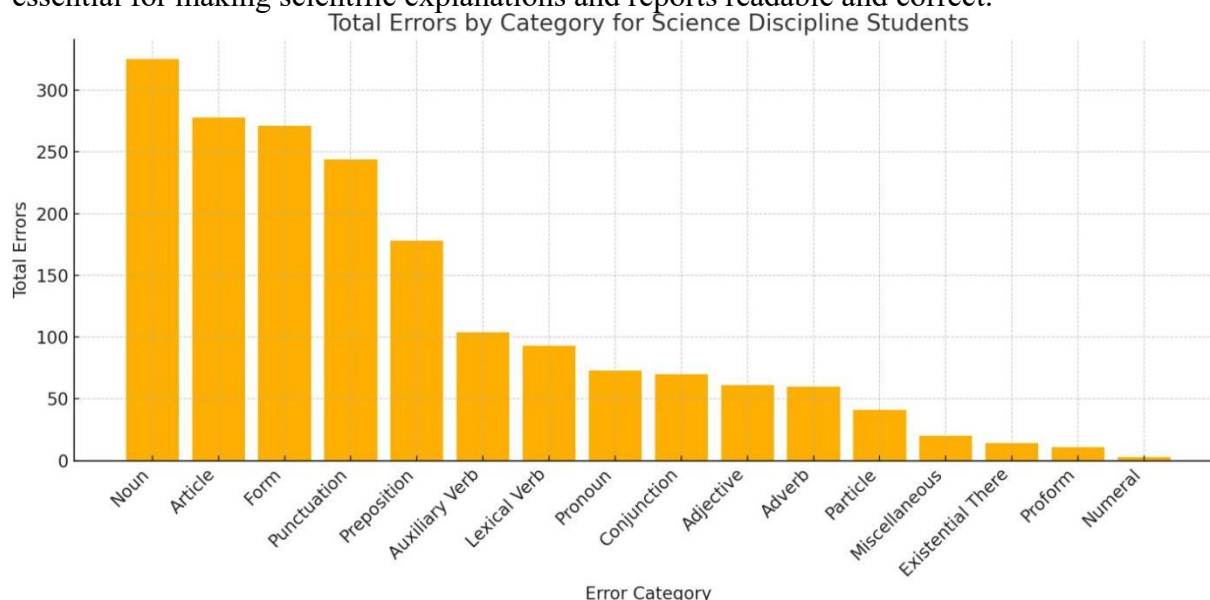
Table 4.8

Examples of Article Errors among Science Students

Input Text	Error Sub-Type	Justification	Correction
Social media facilitates the skills, education, communications, etc.	Definite Article	The definite article 'the' is unnecessary before the generic nouns 'skills', 'education', and 'communications'.	Social media facilitates skills, education...
Technology plays role in agriculture.	Indefinite Article	The indefinite article 'a' is missing before the singular, countable noun 'role'.	Technology plays a role in agriculture.
As most harmful effect is harming impact...	Definite Article	Missing definite article 'the' before the superlative phrase 'most harmful effect'.	As the most harmful effect...

4.2.2.3. Form and Punctuation Errors.

The Form errors ($M = 5.42$) and Punctuation Errors ($M = 4.88$) stand out. These categories stress the necessity for good knowledge of grammatical structure and clarity of thought, which is essential for making scientific explanations and reports readable and correct.



4.3. Comparative Analysis of Errors: Arts vs. Science Students

Addressing the research question directly, the findings of the groups of arts and science students were compared. The comparison looks at both the quantitative frequencies of errors and the qualitative nature of the most common mistakes.

4.3.1. Comparison of Error Frequencies

A quantitative comparison of the mean errors per student for each of the 16 categories reveals significant similarities, but also notable differences between the two cohorts. Table 4.7 shows a side-by-side view of the mean error scores for arts and science students, with the higher mean in each category highlighted.

Table 4.9

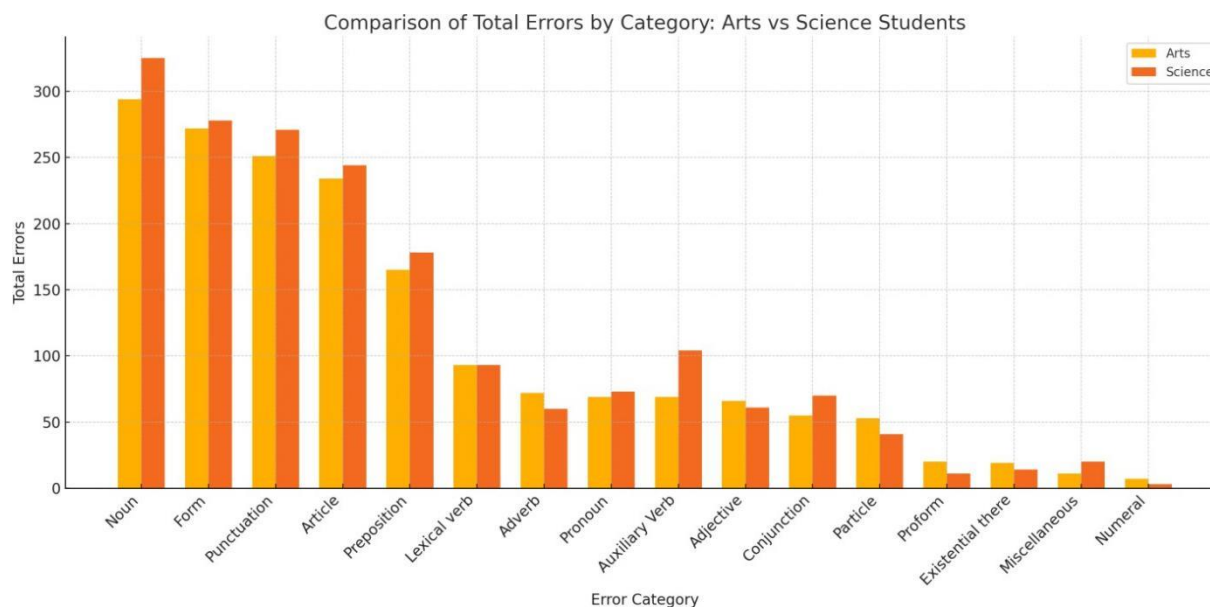
Mean Writing Errors per Student by Category and Discipline ($N = 100$)

Sr. no.	Error Category	Mean (Arts)	Mean (Science)
1.	NOUN	5.88	6.50
2.	Form	5.44	5.42
3.	Punctuation	5.02	4.88
4.	Article	4.68	5.56
5.	Preposition	3.3	3.56
6.	Lexical verb	1.86	1.86
7.	Adverb	1.44	1.20
8.	Pronoun	1.38	1.46

9.	Adjective	1.32	1.22
10.	Auxiliary verb	1.38	2.08
11.	Conjunction	1.1	1.40
12.	Particle	1.06	0.82
13.	Preform	0.4	0.22
14.	Existential there	0.38	0.28
15.	Miscellaneous	0.22	0.40
16.	Numeral	0.14	0.16

An important finding in this study is the remarkable consistency regarding the most problematic types of errors. For both arts and science students, the four categories most frequently committed were **Noun, Form, Punctuation, and Article**. This indicates that these categories cover the basic challenges common to Pakistani university students in their English writing, irrespective of their area of specialization.

Even though some overlap does exist between the two groups, certain distinctions along disciplinary lines run deep. **Noun and Article** errors occurred much more frequently for science students than their arts counterparts (**Noun**: M = 6.50 vs. 5.88, **Article**: M = 5.56 vs. 4.68). The starkest difference was found in the **Auxiliary Verb** category whereby the science students recorded a substantially higher average frequency of errors (M = 2.08) against the arts students (M = 1.38). Arts, however, had a slight edge over Sciences in **Form** (M = 5.44 vs. 5.42) and **Punctuation** errors (M = 5.02 vs. 4.88).



5. Discussion:

The study revealed both similarities and differences between Arts and Science students' English writing errors in Pakistani universities. In general, the four major error types, namely Nouns,

Articles, Forms, and Punctuation, were somewhat similar for both groups, signifying that such types of error areas constitute major obstacles to L2 learners in the Pakistani L2 environment regardless of the disciplinary domain background. This is consistent with earlier findings which identified article use, pluralization, and punctuation as a few sturdy problem areas for ESL writers from South Asia (Khan, 2015; Hyland, 2003).

5.1. Similarities in Errors:

The pervasiveness of Noun errors in both groups exemplifies the problem of pluralization, possessives, and non-count categories mainly caused by language transfer from differences between English and their first language or mother tongue, that is, Urdu. Article errors, in like manner, were widely made by the two groups, and this choice of error indicates the ease with which L2 writers have with the use of definite and indefinite articles, which may not have a direct equivalent in many South Asian languages (Rahman, 2002). The frequency of these error types indicates the need for continuous yet explicit instruction where L1-L2 structural differences are most prominent.

5.2. Disciplinary Differences in Error Profiles

Yet, differences due to disciplinary affiliation did emerge. While Science students showed greater mean errors in the categories of Noun, Article, and Auxiliary Verb, Arts students exhibited somewhat greater frequencies in Form and Punctuation. Such differences may be owing to the contrast in writing conventions in the two disciplines. Science writing appears to prescribe concise, technical description and formal structure, thereby possibly producing problems with articles and auxiliaries because the students may not yet have the facility to cope with such demands on the scientific register (Swales, 1990). On the other hand, Arts students are mostly engaged in writing longer, more interpretative essays that may explain why they commit a larger number of the punctuation and form errors while attempting complex construction.

5.3. Genre-Based Interdisciplinary Variation

The observed variation across disciplines supports the belief that there exist genre and register expectations able to shape writing (Biber, 2006). Arts students normally produce argumentative and interpretive texts that require critical engagement and more subtle expression, but Science students work with data genres based on value systems emphasizing clarity and precision. These different rhetorical demands will also determine the linguistic choices of students along with their errors. This lends weight to Hyland's (2003) claim that writing instruction has to be discipline-oriented to be proper.

5.4. Pedagogical Implications

The results highlight the importance of discipline-specific ESL writing instruction in universities of Pakistan. Present writing support is mostly generic, focusing on very general grammar and composition skills while ignoring the distinct needs of students from various fields. Thus insertion of targeted instruction could directly address the particular areas of difficulty identified in each student group: for example, Science students need support with articles, auxiliary verbs, and the technical use of nouns, while Arts students require help with punctuation and sentence structure in long argumentative texts. Following this, error analysis could be put to teach students metacognitive awareness and self-correction strategies (Corder, 1967; Ellis, 1994).

6. Conclusion:

This study investigated the English writing errors of Pakistani university students across two major academic streams—Arts and Science—to explore how disciplinary variation influences error

patterns. The findings revealed that while both groups struggled with similar core areas—Noun, Article, Form, and Punctuation errors—there were clear differences in error frequency and distribution. Science students exhibited more challenges with Noun, Article, and Auxiliary Verb usage, whereas Arts students had slightly higher rates of Punctuation and Form errors. These differences reflect the distinct rhetorical and structural demands of disciplinary writing genres, supporting the view that writing is context-dependent and shaped by academic conventions (Biber, 2006; Swales, 1990).

The results underscore the need for targeted ESL writing instruction that is sensitive to disciplinary variation. Generic writing courses fail to adequately address the unique linguistic challenges faced by students in different fields. Therefore, discipline-specific teaching approaches should be incorporated into curricula, focusing on the particular error-prone areas identified in this study. Writing support programs, workshops, and feedback mechanisms tailored to Arts and Science students can help bridge gaps in grammatical accuracy, genre awareness, and academic expression. Finally, the prevalence of these errors also reflects deeper systemic issues in Pakistan's education system, including the lack of early exposure to academic English and minimal opportunities for extended writing practice. Addressing these challenges requires a coordinated effort at both the school and university levels to integrate writing instruction across the curriculum. By adopting a more discipline-aware approach, educators can enhance students' L2 writing proficiency, improve their academic performance, and better prepare them for professional success in a competitive, English-dominant world.

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