P-ISSN 2708-6453	Pakistan Languages and Humanities Review	Apr-June 2024, Vol. 8, No. 2
O-ISSN 2708-6461	https://doi.org/10.47205/plhr.2024(8-II)24	[277-285]

Pakistan Languages and Humanities Review
www.plhr.org.pk

RESEARCH PAPER

Grammatical Error Analysis of Postgraduate Theses in Natural Sciences

[1]Arifa Fiaz, and [2] Dr. Iram Rubab*

1. M. Phil Scholar, Department of English, GC Women University Sialkot, Punjab, Pakistan
2. Assistant Professor, Department of English, GC Women University Sialkot, Punjab, Pakistan

*Corresponding Author	iram.rubab@gcwus.edu.pk

ABSTRACT

This aim of the study is to identify the grammatical errors made by Natural Sciences Postgraduate students in their theses which were classified in terms of 'surface taxonomy' introduced by Ellis & Barkhuizen (2005) i.e, 'omission', 'addition', 'misformation' and 'misordering'. In this regard, data was collected from the University library in relation to Departments of Zoology, Botany, Physics and Chemistry. Four theses from each department were selected and total sample was comprised of sixteen theses. And then data was qualitatively analyzed. Findings revealed that mostly errors were observed in 'omission' category, which were 50.25% collectively and least errors were regarding 'misordering'. Whereas, the 'misformation' category contains 34.55% errors and 'addition' category contains 14.02% errors. It shows the students don't have sufficient competency in English grammar to present their thoughts in their theses. This study will be beneficial for the stakeholders. ESP writing courses, workshops and trainings are suggested to improve their writing skills.

KEYWORDS Grammatical Errors, Writing Skills, Writing Taxonomy

Introduction

Writing is one of skills that requires thinking process in order to deliver the meanings in written form. Writing requires a good knowledge of grammar and word choice. One of the most important aspects of writing that guarantees accuracy and clarity in scientific communication is the study of grammatical errors in research writings. Researches have indicated that errors in English writing are ubiquitous, with common concerns including misformation, omission, addition, and misordering. The value of error analysis in pinpointing troublesome language learning domains and offering insightful information to educators, curriculum designers, syllabus developers, and students alike. Errors related to verb tense, article usage, incorrect word order, and sentence structure are frequently observed in academic writing.

Writing a thesis is a significant milestone in one's academic journey representing a culmination of years of research and study. However, amidst the depth of content complexity of ideas, grammatical errors can often detract from the clarity and impact of the work of understanding and analyzing these errors in theses is essential of ensuring the quality and effectiveness of academic writing. Studies on grammatical errors are important as these studies help to identify common errors made by learners of languages and provide valuable insight into the effectiveness of language teaching methods and approaches. One of the most important reasons for language learners to make grammatical errors is that they always try to use their first language's rules and its patterns in a new language. Language transfer is used to describe this phenomenon (Keshavarz, 2012; Al-Husban, 2018; De Glopper & Schoonen, 1996).

In the realm of Postgraduate education in Natural Science, the production of high quality theses stands as a critical milestone for students seeking to contribute to their respective fields of study. However, a recurring issue of concern pertains to the presence of grammatical errors within these theses. These errors not only impede the effective communication of research findings but also reflect upon the academic rigor and professionalism of the students and their institution. Thus, a comprehension analysis of grammatical errors prevalent in the Post Graduate theses of Natural Science students become imperative. The study seeks to identify, categorize and evaluate the grammatical errors within these theses, aiming to understand the scope and grammatical errors regarding omission, addition, and misformation and misordering.

As the undertaken study is mainly focused on Natural Sciences students. They are the major pillars of our society. Natural Sciences is a very significant area of education. A need to do research on these student's writings because Natural Sciences students focus only on meaning of the sentences rather than grammar and structure. Their motive is to present their experimental work in theoretical form without focusing grammar rules. They make errors while writing. They are the future researchers; and are supposed to present their researches, and give directions to their junior researchers. Their piece of writing must be error-free and grammatically true. To reduce this gap, this research has been carried out on theses of Natural Science researchers. In this context, following research question has been generated: What type of grammatical errors are made by Natural Sciences postgraduates' students in their theses?

Literature Review

According to Richard et al (2002), an error is the use of a word, speech act or grammatical items in such a way that it seems imperfect and significant of an incomplete learning. Similarly, Norrish (1983) defined error as a systemic deviation that occurs when a learner repeatedly makes an error which indicates material is not learned. Learner's errors are described by Ellis (1985) as follows: "Error analysis is the study of the errors that students make in their speech and writing. Out of all the techniques for analyzing a learner's language, it is the most experienced technique. A series of processes called 'Error Evaluation' is used to determine the relative seriousness of learners' mistakes. Additionally, he stated that while identifying a learner's mistakes, interlanguage is a crucial consideration.

Dinamika (2021) executed a research focusing on grammatical errors in theses abstracts written by undergraduate students of Management Sciences Program by using qualitative approach. Another research conducted by Parvez (2010) on syntactic error analysis of Graduate Science students by collecting a sample of thirty papers used in the University of Sargodha's Bachelor of Science students' internal assessment. For this, Corder (1981) model of error analysis was applied and found majority errors in omission category. While, Rinnert (1992) compared the use of translation as a strategy in L2 composing with direct composing in the L2. Findings revealed the following issues with performance in the following areas: tense agreement; relative clause construction; indirect questions; perfective tenses; and usage of prepositions. On the other hand, Khasawneh (2010) investigated the academic writing issues encountered by Arab postgraduate students at the College of Business at University of Utara Malaysia and suggested different solutions in his study. The findings revealed students' problematic areas were grammar, spellings, references, vocabulary register, and conceptual structure.

Concerning to another study, Syaifullah & Sukova (2022) analysed the grammatical errors prevailed in the abstract writings of Biology Department. The findings of the study

indicated certain grammatical problems in their abstracts: omissions', 'additions', 'selections', and 'misordering' errors. Similarly, Mertosono & Erniwati (2023) carried out a research to identify the types of errors and their causes on analytical exposition texts. These errors were classified into five major categories: orthographic errors, word forms and grammar (morpho-syntactic errors), errors on words and meanings (lexico-semantic), errors in punctuation and errors in capitalization. And the causes were interlingual and intralingual factors. Ashraf, et al (2020) investigated the problems of organization and vocabulary in academic writing encountered by the students at postgraduate level. Similarly, another study conducted in Malaysia to identify the dominant errors made by the graduate students of English Department from Muhammadiyah University of Mataram. The researcher used qualitative approach along with surface taxonomy strategy of (Dulay, Burt & Krashen, 1982). Similarly, Ghani & Rubab (2014) analysed the English writing competence of Social Sciences students and investigated their writing problems.

There has been much research done on error analysis like speaking and writing but not at Postgraduate level. The research gap of this study is that there has not been any study done on error analysis of Postgraduate Natural Sciences theses. Moreover, there has not been any research done on error analysis at postgraduate theses of Natural Sciences students of Sialkot.

The theoretical framework of Corder (1981) explaining the type of errors is served as a foundation of this research. He contends that mistakes happen when a learner has not yet mastered a particular grammatical form while errors happen when the learner has gaps in their knowledge of English (Ellis & Barkhuizen , 2005). It can be challenging to identify errors in texts since it is difficult to distinguish them from mistakes while analyzing the data. However, Corder (1981) has developed an analytical technique, called error analysis which can be used to identify errors in writing. The taxonomy by Ellis & Barkhuizen (2005) of error analysis is used in the current study. This taxonomy involves the collection of sample, identification of errors, description of errors, explanation of errors and evaluation of errors.

Material and Methodology

This study is qualitative in nature. By using content analysis, data has been analysed. In light of Purposive sampling, data was collected from the library of Government College Women Universit Sialkot regarding the theses submitted by the students of Natural Sciences disciplines of session 2016-2020. The theoretical framework of Gas & Selinker (2008) was applied in order to identify grammatical errors from theses which contain following steps:

- Collection of errors
- Identification of errors
- Description of errors
    - Omission
    - Addition
    - Misformation
    - Misordering
- Explanation of Errors
- Evaluation of Errors

The surface taxonomy introduced by Ellis & Barkhuizen (2005) was also used to categorize the errors which are: 'omission', 'addition', 'misformation' and 'misordering'. In this study, total 16 theses from Natural Sciences Departments were selected; out of them, 4

were from Botany Department, 4 were from Chemistry Department, 4 were from Zoology Department and 4 were from Physics Department. The theses were taken from the years 2016-2020 because only these four departments from Natural Sciences were enrolled for MS Program since 2016. The postgraduate Natural Science theses abstracts along with chapter 1 of the students who minor in English and graduated during the academic year 2016-2020 served as the secondary data. The researcher has chosen only sixteen representative abstracts along with the 1st chapter of theses for sake of error analysis.

Results and Discussion

The aim of the study is to highlight the different types of grammatical errors in Natural Sciences students' theses. In this regard, the researcher has chosen four departments from Natural Science of Govt. College Women University Sialkot: Botany, Physics, Chemistry and Zoology. The researcher highlighted the errors and then classified them considering surface taxonomy categories introduced by (Dulay, 1982). The grammatical errors are classified into four categories: omission, misformation, addition and misordering. These categories are discussed as; the first category, 'omission' is described as 'the absence of an item that should be present in a proper form of utterance was known as omission'. Second category, 'misformation' is described as 'some morpheme types were left out more frequently than others. Additionally, a misformation error had the incorrect morpheme or structural form as its defining feature. Third category, 'addition' can be described as 'addition error was something that wasn't supposed to be said in the right way'. This kind of error typically occurs when the student has already mastered a few target language fundamentals. Fourth category, 'misordering', an incorrect placement of a morpheme or set of morphemes was known as a misordering error. The description of each category includes different aspects as mentioned in the following table 1

Table 1
Reflecting the Description of Error Categories

Error Categories	Description
Omission	Omission of articles, singular/plural, pronouns, punctuations and, prepositions
Addition	Addition of articles, singular/plural, preposition, pronouns, verb (ing)
Misformation	Misformation of SVA, prepositions, articles, spellings, word choices
Misordering	Misordering of morphemes, sentences, noun phrases,

Analysis of postgraduate theses of Natural Sciences disciplines with reference to omission category of errors has been given in the following table 2.

Table 2
Representing Omission Category

p	Total No. of Errors and Frequency
Botany Theses	105 (53.02%)
Physics Theses	852 (46.19%)
Chemistry Theses	141 (53.40%)
Zoology Theses	109 (48.4%)

With the perspective of 'omission' category in Botany theses, the researcher found (n=105) omission errors in totally with the percentage of 53%. The highest number of errors found in this category in Botany theses were omission of articles a/an/the which are (n=59)

in total and the least error found in this category are misordering errors which are only 3 in total. On the other hand, regarding omission category in Physics theses, the researcher found (n=852) number of errors with percentage of 46.19% in this category 'omission of articles a/an/the' (n=40) in total and least errors were of misordering error which are 4 in numbers.

In contrast, with the perspective of omission category of Chemistry theses, the researcher identified (n=141) errors of omission category with percentage of 53.40% which includes; omission of article on top with (n=62) in total and least errors were misordering errors 1 in total. Whereas, regarding omission category of Zoology theses, the researcher identified (n= 109) number of errors in omission category with the percentage of 48.4% and least errors were only 1 in this category. On the whole, it is observed that the errors found in omission category of each department, the students of Physics Department have highest frequency of omission errors.

Description regarding 'addition' category of errors

Analysis of postgraduate theses of Natural Sciences disciplines with reference to 'addition' category of errors has been given below:

Table 3
Representing Addition Category

Departments	Total No. of Errors and Frequency
Botany Theses	24 (12.12%)
Physics Theses	25 (13.5%)
Chemistry Theses	30 (11.36%)
Zoology Theses	43 (19.1%)

With the perspective of addition category of Botany theses, (n=24) errors in addition category with the percentage of 12.12% are observed. This category of errors includes; addition of article, preposition, verb(ing), singular/plural and pronoun. On the other hand, addition category of Physics theses, (n=25) errors in addition category with frequency of 13.5% are observed. This category has highest number of errors in addition of prepositions and made least errors in addition of article. Whereas, regarding addition category of Chemistry theses, (n=30) errors with the percentage of 11.36% are found. The highest number of errors in this category made by the students are addition of preposition which are 12 in total. Similarly, regarding addition category of Zoology theses, (n=43) number of errors in this category with reference to frequency of 19.1% are found. This category includes the highest number of errors in addition of articles a/an/the which are 14 in total.

On the whole, it is concluded that students of Zoology Department have committed more errors in addition category which is 10.1% and least numbers of addition errors are committed by Chemistry Department's students which is 11.36%.

Description regarding 'misformation' category of errors

Analysis of postgraduate theses of Natural Sciences disciplines with reference to 'misformation' category of errors has been given below:

Table 4
Representing Misformation Category

Departments	Total No. of Errors and Frequency
Botany Theses	66 (33.33%)
Physics Theses	70 (38.04%)

Chemistry Theses	92 (34.84%)
Zoology Theses	72 (32%)

Concerning misformation category of Botany theses, (n=66) errors in misformation category with the percentage of 33.33% are found. This category has the highest number of errors in misformation of subject-verb agreement which are 14 in total. On the other hand, regarding misformation category of Physics theses, number of errors (n=70) with the percentage of 38.04% are identified. This category has highest number of errors in word choice which are 22 in total.

Similarly, misformation category of Chemistry theses shows the number of errors in misformation category are (n=92) with percentage of 34.84%. This category contains highest number of errors in word choice and prepositions. In contrast, regarding misformation category of Zoology theses, Number of errors (n=72) with percentage of 32% are identified. This category has highest number of errors in word choice.

On the whole, it is observed that students of Physics Department obtain the highest frequency of misformation errors which is 38% and lowest frequency errors in this category is in Zoology Department which is 32%.

Description regarding 'misorderin' category of errors

Analysis of postgraduate theses of Natural Sciences disciplines with reference to 'misordering' category of errors has been given below:

Table 5
Representing Misordering Category

Departments	Total No. of Errors and Frequency
Botany Theses	3 (1.51%)
Physics Theses	4 (2.17%)
Chemistry Theses	1 (0.37%)
Zoology Theses	1 (0.44%)

With reference to, misordering category of Botany theses, (n=3) errors with the percentage of 1.51% are identified. This category contains misordering of morpheme, sentence and a noun phrase. In contrast, concerning to misordering category of Physics theses, (n=4) number of errors with the percentage of 2.17% are observed. This category contains highest number of errors in misordering of morpheme. On the other hand, regarding misordering category of Chemistry theses, (n=1) error in the theses of Chemistry Department with percentage of 0.37% are found. The error found in this category was misordering of a sentences.

Similarly, misordering category of Zoology theses, (n=1) error in this category in Zoology theses with percentage of 0.37% are identified. The error found in this category was misordering of a morpheme.

On the whole, the students of Physics Department with frequency 2.17% have highest number of errors in mirodering category while the lowest number of errors in this category is in Chemistry and Zoology Department with the same frequency of 0.37%.

Overall Findings of Each Category

Overall findings of each category he been given below in the table 1.6:

Table 6
Representing Overall Percentage of all categories of errors found in theses

Name of category	Average Frequency
Omission	50.25%
Addition	14.02%
Misformation	34.55%
Misordering	1.12%

The above table represents the average frequency of all the categories of departments collectively. The results identified the highest frequency in omission category which is 50.25%, then there is frequency of misformation error 34.55% whereas addition error category is of frequency 14.02% and the least frequency is misordering 1.12%.

The researcher found the most frequent errors in all 4 departments is error of omission of article (the/an/a). The study shows that the students of each department of Natural Sciences are not skillful in their grammar while writing. They have made the least errors of misordering. The students have made errors in addition and misformation also in their theses. It is very clear from this research that the students struggle to acquire English grammar, but all they need is to boost learning motivation. Recall the objectives and motivations for studying English.

- According to the findings and results, students seem not to be skillful in structure of English. The frequency of each category is mentioned department vise.
- The researcher has identified the errors according to the given research question which is about to find type of grammatical errors in theses. The types of grammatical errors are well identified through qualitative analysis from 4 departments.

Conclusion

In the light of objectives and research questions, the researcher has conducted this study to analyze the grammatical errors in Postgraduate Natural Sciences Theses. Aim and research objectives of the undertaken has been justified. In light of major research question, the findings reveal 12 types of grammatical errors in theses which include: articles, spellings, word choice, preposition, morpheme, sentence structure, noun phrase, verb(tenses), subject-verb agreement, singular/plural, punctuation, pronouns. The study revealed that most frequent type of errors made by students were article and punctuation errors.

Concerning to the subsidiary points of the errors, the study reveals that students of Natural Sciences have made more errors in omission category. Each department including; Botany, Zoology, Physics, Chemistry students have made errors in omission category the most. In omission category, students have made errors of articles a/an/the which they omit while writing their theses. The findings of this study will be beneficial to design ESP courses and materials to improve the current situations of writing skills of Natural Sciences researchers.

Recommendations

In the light of aims of the undertaken study, following are recommendations for both teachers and the students:

- The Natural Sciences Researchers should focus on the grammar and structure of English language while writing. They should practice for writing a good piece of English paper.

- In order to avoid making errors in writing, the Natural Sciences Researchers should pay attention to learn grammar properly.

- The Natural Sciences Researchers should focus while writing as some errors become major mistakes for their writing and can change the meanings of their concerned points.

- The Natural Sciences Researchers must read variety of texts, stories and books on English to enhance their vocabulary.

- The teacher must ask difficult questions to Natural Sciences Researchers in order to make them understand the language with grammar properly.

References

Al-husban, N. (2018). Error Analysis of Jordanian First - Year University Students' English Language Writing at Arab Open University – Case Study. *International Journal of Pedagogical Innovations, 6*(1), 23–30

Al-Khasawneh, F.M.S. (2010) *Writing for Academic Purposes: Problems Faced by Arab Postgraduate Students of the College of Business*, UUM. ESP World, 9, 1-23.

Ashraf, M., Rubab, I. & Ajma,M. (2020). Investigating the Problems of Organization and Vocabulary in Academic Writing Encountered by Students at Postgraduate Level. *International Journal of Advanced Science and Technology, 29*(8), 2766-2779.

Corder (1981) *Error Analysis and Interlanguage*. Oxford: Oxford University Press,

Corder, Pit. (1967). the significance of learner's errors. *International Review of Applied Linguistics, 5,* 161-170

De Glopper, K., & Schoonen, R. (1996). Writing performance and knowledge about writing. In G. Rijlaarsdam, H. van den Berg, & M. Couzijn (Eds.), *Theories, Models and Methodology in Writing research.* (pp. 87-107). Amsterdam University Press.

Dinamika, S.G. (2021). Grammatical Errors in Thesis Abstracts Written by the Undergraduate Students of Management Study Program. *Journal of Applied Linguistics and Literature, 6*(1), 72-86. doi: http://dx.doi.org/10.33369/joall.v6i1.12443

Dulay, H., Burt, M., & Krashen, S. (1982*). Language Two*. Oxford University Press.

Ellis & Barkhuizen (2005). *Analyzing Learner Language*. Oxford: Oxford University Press.

Erniwati, E., & Mertosono, S. R. (2021). *Error Analysis: Types and Causes of EFL Learners' Errors in Writing Analytical Exposition Text*. *Eralingua: Jurnal Pendidikan Bahasa Asing dan Sastra, 7*(1), 64-77

Gas and Selinker (2008) *Second language acquisition: An introductory course,* Routledge.

Ghani, M. & Rubab, I. (2014). English Writing Competence: A Study on Social Sciences Students of Bahauddin Zakariya University Multan. *EFL Annual Research Journal*, *16(16),* 119-136.

Keshavarz, M. H. (2012). *Contrastive analysis and error analysis*. Rahnama Publications.

Kobayashi, H., & Rinnert, C. (1992). Effects of first language on second language writing: Translation versus direct composition. *Language Learning, 42*(2), 183–215

Norrish, J. (1983). *Language learners and their errors*. London: Macmillan Press

Pervaiz, A. & khan, M.K. (2010). *Syntactic Errors Made by Science Students at the Graduate Level in Pakistan- Causes and Remedies*. Language in India.

Richards, J. C. & Schmidt, R. (2002). *Dictionary of language teaching and applied linguistics* (3rd Ed.). London: Longman.

Syaifullah, S., & Sukova, H. M. (2022). An analysis of grammatical errors on undergraduate thesis abstract. *ELT-Lectura, 9*(1), 18–27