Writing Errors of Engineering Students: Reflections on Teaching and Assessment

Mehvish Riaz[1]

Article History:	ABSTRACT
Received: 7 March, 2021 **Accepted:** 24 June, 2021	The study emphasizes the importance of accuracy in students' writings and the responsibilities of teachers in this regard. It aims at inspiring the teachers and learners of science and engineering to concentrate more on learning English and hone their writing skills. An error analysis of the paragraphs written by the engineering students at UET, Lahore has been done. Frequencies of the errors of tenses, capitalization, word choice, spellings, articles, and prepositions have been checked. A sample of 25 students has been selected randomly from different departments and data have been analyzed qualitatively. Results suggest that engineering students make errors of tenses and word choice the most. Issues regarding capitalization, spelling, punctuation, translation, organization, coherence, and editing have also been found. Students make errors of omission, transfer, addition, mis-ordering, and misinformation as suggested by Ellis (1994). Suggestions have been made for teachers to adopt task-based methods for teaching writing skills, use varied materials, check the assignments, give feedback and make the writing process interesting for learners so that the 21st century challenges can fairly be met. ***Key Words:*** Error analysis, Task-based writing, accuracy, learner autonomy, engineering education, English Language Teaching, UET

Introduction

In the 21st century, it is required essentially to make the students independent, creative, and autonomous by employing task-based or project-based teaching methods, giving them individual attention, time, and choice, and making them reflect on their learning and skills. The importance of learning English for the students of science and engineering is generally neglected, especially in the developing countries, even though they appear "for competitive exams such as PMS or CSS, appear for IELTS, TOEFL" (Akhtar & Riaz, 2019, p. 4; Riaz, 2021), or GRE tests, write research papers and theses and write emails, technical reports and proposals while doing jobs in engineering fields. Santos (2019) notes, "During the past decade, the immigrant population has become the largest minority population in the United States, representing almost one-third of the total

1. University of Engineering and Technology, Lahore – Pakistan

population". In this situation, although more than half of the coursework in engineering concerns science subjects, "advanced English skills are still essential to understand and master the textbook knowledge necessary" because engineering students "with weak English skills are more likely to experience stress and burnout during their engineering education" (Santos, 2019, p. 37).

The study, therefore, sensitizes the audience to the causes, effects, and solutions for errors in engineering students' writing. It aims at reinforcing the need for adopting task-based methods to teach how to write, using varied materials, evaluating the assignments, giving proper feedback, and making the writing process interesting and meaningful for the students. As Corder (1967) suggests "we cannot really teach language, we can only create conditions in which it will develop spontaneously in the mind in its own way" (Corder, 1967, in Riyaz, 2014, p. 80). The study emphasizes the need for revision in the methods of teaching and assessment for teaching writing skills in the 21st century.

English as an international language and "the language of science and technology" (Riaz, 2015, p. 23) is significantly valuable for the students of science and engineering because they go to other countries for jobs and further studies. They frequently make presentations and write reports, emails, memorandums, and proposals at their workplaces. Therefore, it is immensely important to improve their writing skills so that they may get their message effectively across while communicating with any kind of audience. Sattayatham and Ratanapinyowong (2008), claim that for scientists, writing is essential. Scientists must not only "do" science but must "write" science…writing is of course, not easy and in some way, more difficult than speaking" (p. 22). Buriro and Soomro (2013) found that out of four language skills, the engineering students deem writing as the most important skill for their academic and professional success. They also consider learning technical vocabulary more important than general vocabulary and grammar (p. 88-89). According to Ngaada (2014), writing skills are "essential for professional success after graduation. It is an assertion that the importance of writing is not unique to liberal arts or social sciences alone but is also germane in science and technology courses" (p. 10).

In the present study, an error analysis of the texts created by the undergraduate engineering students belonging to the University of Engineering and Technology, Lahore has been done. The purpose of the study is to find out whether engineering students make errors of tenses, capitalization, word choice, spellings, articles, and prepositions. The number of errors in the engineering students' writing have also been counted and shared in this study.

Riyaz (2014) noted, "Error analysis is a technique to identify, classify the unacceptable forms produced by a learner which also can be systematically interpreted

using the principles and procedures based on linguistics advises" (p. 71). According to Selinker (1992), errors are of immense value because these are devices used by the learners to learn a language (p. 150, cited in Riyaz, 2014, p. 71). It is imperative to distinguish between errors and mistakes here. Mistakes are slips of tongue or pen and are non-systematic, whereas, errors are systematic lapses of knowledge and are repeatedly made (Crystal 1980).

Riyaz (2014) found that engineering students commit the errors related to SVA, verbs, word order and fragmented clauses the most. They make lesser errors of plurals, wrong words, articles, and punctuation, etc. Ngaada (2014) observed that the descending order of frequency of errors in students written English at ATBU, Bauchi is: "Grammar, Expression, Punctuation, Spelling, Vocabulary and Connectives" (p. 11). These errors are caused by mother- tongue interference, intralingua difficulties, faulty teaching and learning, and lack of much exposure to the target language. Judith et al., (2014) found the most common errors in the essays written by the Chinese learners of English as L2 are "verb-tense, word choice, spelling, punctuation, preposition, and omission" (p. 144). He also found transfer errors which were manifested through the fragments and spellings. Moreover, the limited knowledge of grammar and lack of vocabulary also caused errors.

Jayasundara and Premarathna (2011) analyzed the errors made by the undergraduate students and they ranked the grammatical errors as the most frequently made errors. Learners also made errors related to vocabulary and spellings. They suggest that training the teachers, exposing the learners to an academic environment, and making them read newspapers can help eliminate the number of errors. Bodunde and Sotiloye (2013) did an error analysis of the students of agriculture management and animal sciences at (FUNAAB) and concluded that in "500 level students' writing, tense is most problematic while the spelling is the most difficult area for 100 level students" (p. 18). Abeywickrama (2010) noted that **"**only 20% of the errors occur due to the influence of the L1 interference while majority of them (45%) can be identified as developmental errors" There is paucity of research on the error analysis of the texts created by engineering students in Pakistan, therefore, the present study explores the following research question:

- What is the frequency of tenses, capitalization, spellings, word choice, articles and prepositions in the texts created by engineering students?

Firstly, the study explores and analyzes the errors made by the students of engineering in Pakistan and suggests ways to overcome the problems to make the writing process task-based and focus on learner autonomy. It not only identifies and describes the errors which may consequently benefit the teachers, learners, and curriculum developers but also suggests ways to make the writing process less boring and more meaningful.

This study also encourages the book publishers to take advantage of different materials and include activities in their books.

Secondly, engineering students ignore the importance of learning English because they give more importance to their engineering related subjects, and eventually face challenges while applying for jobs and scholarships or working as professional engineers. In addition, the lack of richer language input given both by English and engineering teachers is also an issue because teachers' proficiency in English and beliefs about it may be a hurdle. The study inspires the science teachers, specifically, teachers teaching at engineering universities to understand the importance of learning accurate English in getting the message across effectively, as well as take strides to bring variety, diversity, and practicality to teaching the writing skill. Pathan (2012) in asserting the value of English states that the slogan should be 'the confident and motivated English speakers make successful engineers. He suggests that to increase the motivation of students, they must be given an English learning environment so that they may learn English well and communicate effectively.

Thirdly, the study sensitizes the teachers, learners, curriculum developers, and book publishers regarding accuracy in the writing of science and engineering students. "The effectiveness of any writing is determined by grammatical correctness as syntactic ambivalence leads to semantic ambiguity" (Jekins et al., 1993, in Ngaada, 2014, p. 10). It is natural to make mistakes because English is learnt as a second or foreign language; however, incorrect use of English creates misunderstandings, and wastes time. Besides, in order for a professional to rise the ladder of success, English is genuinely a vital skill (Santos, 2019). Teachers, due to various reasons, such as "imbalanced teacher-student ratio… excessive workload on teachers, inattention to the use of diverse learning materials, etc." (Akhtar & Riaz, 2019, p. 16), cannot always provide effective individual feedback which consequently results in a large number of errors in the texts created by students. This study may help motivate the audience to check the classwork, homework, or assignments of the students and give them proper feedback.

The suggestions made in the form of activities and solutions will not only help motivate the audience to adopt task-based methods of teaching how to write, make the learner autonomous, use various materials, check the assignments of the students and give them proper feedback but also inspire the students of science and engineering to concentrate on editing and revising independently.

1. Methods

UET, Lahore is the oldest public-sector engineering university in Pakistan. Students from all over Pakistan, as well as countries, such as Somalia, Yemen, Jordan,

Saudi Arabia, Bangladesh, Sri Lanka, and Nepal, join it for their undergraduate, graduate, and postgraduate programs related to engineering and basic sciences. The students at UET have very strong academic backgrounds and many of them are highly proficient in speaking and writing English. However, due to diverse regional backgrounds, Urdu-medium schools and colleges, financial challenges, academic background of parents, insufficient language input, scant opportunities to speak English in day-to-day conversation, they essentially need improvement in written and spoken English. All the undergraduate students are taught 'English Communication Skills' and 'Technical Writing and Presentation Skills' which are taught in the first and third year of the BS Engineering program. The sample of the study comprises of 25 Pakistani undergraduate engineering students from five departments at UET, Lahore. They were doing Technical Writing and Presentation Skills in the third year of their four-year BS programs.

Data have been collected by giving writing prompts to the third-year students. They were asked to either share their experiences of doing 'Communication skills' along with suggestions for teaching 'Technical Writing and Presentation Skills' or describe how they spend their vacation. The topics were easy, understandable, and descriptive so that the participants could relate and express their ideas easily. They created paragraphs of varied lengths ranging from 100-170 words. Most of the paragraphs consisted of 120-140 words. Twenty-five paragraphs were collected and analyzed.

The hand-written descriptive paragraphs were analyzed based on six major problems related to tenses, word choice, spellings, capitalization, prepositions, and articles. The paragraphs were repeatedly read, and errors were identified, classified, described, and explained (Corder, 1967; Ellis, 1994). Errors were counted manually. Descriptive analysis of the errors was made.

2. Results and Discussion

The analysis shows that the learners made the following number of errors:

Table 1: Frequency distribution of error types in term paper

Error Type	Number of Participants	Frequency of errors
Tenses	25	82
Word Choice	25	109
Spellings	25	78
Capitalization	25	61

Prepositions	25	23
Articles	25	19
Total		372

Table 2: Examples of different types of errors

Error type	Examples
Tenses	…They *have not* still knowledge…
	…the main thing i *learn* is *to go to* the *students* mental level…
	…which should be *spend* by visiting…
	…Overall, I have *learn* communication *skill* and *learn* how to…
	…there *was presentations 1 or 2 and a last* viva and I think *those a few*…
	…I got A grade and *stand* second in the class…
	… This subject *open* the ways to…
	…*These assignments is* like *a technical* writing…
Word Choice	…At the end of the course, I want myself to be *fully furnished*…
	…*meet* many *people which* is in *sense* are good and bad…
	…'presenting abilities'…
	…Life is not limited *till* our course…
	…*little bit of benefits* I got from...
	…*shineful*… … *as for* as…
	…*there* relative…
	…*everyone has its* own *site of* enjoyment
Spellings	*Consectively, summar, comunication skils, isue, vaccations, grammer, erged, mendatry, proffesional, picknic, admistrator, intrest,writting,*
Capitalization	…Recently *i spend* longish period…
	…*english*…
Preposition	…*we* went *near to* the nearby lake…

	…We were *taught on* subject of CS…
	…Most----- people come with…
	…there is no other place in KPK to compete it regarding to his beauty…
Articles	…before ------ whole class…
	…I expect to be a good presenter *at------ end of* semester…
	…has *a much* importance in *practicle* life…

Examples of errors from the data have been given in Table 2. Table 1 suggests that the selected undergraduate engineering students have made 82, 109, 78, 61, 23, and 19 errors of tenses, word choice, spellings, capitalization, prepositions, and articles, respectively.

The analysis also reveals that the students:

- Translate from their first language. For instance, "…skills *come after practising and practising again*" and 'doing respect' etc. 'Come' and 'doing' here have been used as substitutes for '*AAna*' and '*Krna*' which in Urdu, which is spoken by all these learners, are used as helping verbs. The influence of L1 on writing skills of L2 learners is, in line with the conclusions drawn by Titchenelle (2011) and Crompton (2011). Such errors are termed as transfer errors by Ellis (1994).
- Spell words as they have listened or perceived through their ears such as "*hazitation*", "*shoud*', "*frendly*" and '*acsent*', etc.
- Employ colloquial expressions.
- Use slang.
- Use the SMS language or the language of social media such as +ve, -ve, *urself, b/w, u, plz,* etc.
- Omit the article "the" frequently. It is an error of omission as suggested by Ellis (1994). Aziz et al., (2020) have also found errors of omission the most in their study. Aziz et al., (2020), similarly noted, the "most obvious error manifests in the incorrect choice of article, scoring at 20 cases alone".
- Omit the conjunction "and" where needed.
- Omit verbs, especially helping verbs.
- Switch from one tense to another in the same clause or paragraph when it is not needed.
- Use subject-verb agreement incorrectly.
- Begin sentences with connecting words or conjunctions, such as 'And', 'But', and 'Because' frequently.

- Make gross errors of punctuation on a large scale. These include errors of misinformation, omission, and addition as identified by Ellis (1994).
- Use singular forms of nouns for plural forms.
- Form new expressions such as 'shineful'.
- Use topic-comment structures which make the sentence structure lax, text fragmented, and tone or style colloquial.
- Sometimes, they create very long sentences without paying attention to coherence and cohesion.
- Do not organize the sentences well.

On the one hand, the results of this study vary from those carried out by Sattayatham & Ratanapinyowong (2008), Riyaz (2014), Ngaada (2014), Buriro & Soomro (2013), Abeywickrama (2010), Jayasundara & Premarathna (2011), Pathan (2012), Bodunde & Sotiloye (2013) and Judith et al., (2014)) in that the findings of the present study suggest the word choice, in contrast to tenses, as a major error. On the other hand, the results are similar to these studies in the sense that tenses, vocabulary, and spellings are among the frequently noted errors. Errors of tenses and word choice are errors of misinformation (Ellis, 1994) which involve the "inaccurate use of vocabulary" (Aziz et al., 2020, p. 734) and tenses and these have frequently occurred in the data. Salehi et al., (2018) have also noted the highest frequency of the errors of word usage in scientific articles. Inaccurate use of words may be caused by opting for colloquial expressions than academic or formal ones, and first language interference which involves translating expressions for native languages (Salehi, 2018). For instance, students can use 'show' for 'illustrate', or 'done' for 'conducted'. The interlingual transfer caused by attempts to find lexical equivalences in the native language or translate expressions literally can also cause errors of word choice (Aziz et al., 2020). Issues concerning word-usage also exhibit a lack of rich linguistic input specific to technical or academic writing. Corder (1967) differentiates between language input and intake. The former implies what is available to the learner, while the second refers to what is grasped. Both input and intake should be ensured by the teachers and curriculum developers.

3. Conclusion

The order of the frequency of errors in the writing of engineering students at UET is word choice, tenses, spellings, capitalization, prepositions, and articles. They make errors related to tenses and word choices the most, while they make fewer errors in using articles and prepositions. Lack of reading, linguistic input, and interlingual transfer can be the main causes of inaccurate word choice. Though the frequencies of errors are not alarmingly high, yet accuracy must be one of the biggest concerns of the engineering students, as well as their teachers. For this purpose, a complete English learning

environment should be created through mutual and collaborative efforts of the English teachers, teachers of engineering subjects, and the students. As the data source of this study is small, so for more generalizable results, a large-scale study should be conducted. It may also be a good idea to include teachers' perspectives, problems, and experiences regarding writing skills, accuracy, and feedback.

3.1. Suggestions and Recommendations

To make the writing process interesting for the engineering students and make them autonomous in taking care of accuracy, the following can be done:

- It is important to motivate the learners because when they feel motivated and accept English as a useful language, and not a burden or imposition, they will actively work on accuracy.
- Give the engineering students ample choice of writing tasks so that they develop an interest in writing.
- Combine other skills such as listening, reading, and speaking with writing. Employ listening and reading as pre-writing and speaking (in the form of presentations) as post-writing strategies.
- Use a variety of authentic materials, such as cut-outs from newspapers, reader digests, journals, reports, social media, movie clips, videos, posters, good and poor samples of academic and technical writing, literary extracts, and emails, etc.
- Use the headlines, pictures, captions, dialogues, quotations, incidents, financial reports, letters to the editor, and columns from the newspapers to assign writing tasks to the students.
- Develop the habits and skills of proof-reading, editing, and self-correction among students.
- Give tasks that involve group work, pair work, and individual work.

- Spend more time in getting activities done than delivering lectures. Fatima (2012) noted that grammatical errors or erroneous writing styles are caused by having no exposure to writing reports. Therefore, it is vitally valuable to adopt new activity-based methods of teaching English to engineers.

- Assign them tasks on free and derby writing.
- Encourage the students to volunteer for suggesting writing prompts to their fellows.
- As it has been noted that erroneous word usage is the major issue, engineering students must be familiarized with academic, formal, and technical vocabulary and style.
- Give feedback on the assignments, homework, or classwork.

- Encourage the students to give feedback to their peers.
- Develop the culture of negotiated assessment and portfolio-based assessment.
- Use rubrics for assessment because it brings clarity and makes the evaluation process fair.
- Always return the marked assignments because it is a completely futile exercise if the students do not get to know the errors and flaws in their writing.
- Encourage the students to improve on their assignments and then re-mark them.
- Teach the students various skills such as brainstorming, organization, strategies to bring coherence, avoid repetition, and bring clarity beforehand.

3.2. Activities

The following activities (Riaz, 2013) can be employed to improve the writing skills of engineering students:

- Ask them to make a scrapbook because it can be an effective activity to make them autonomous.
- Make the students write book or movie reviews and short reports on the problems they face or observe around. It develops the habit of writing.
- Give students a list of 6-7 words, share the appropriate contexts for using those words. and ask them to incorporate those words in the same paragraph on any topic. Doing this activity regularly may help improve their vocabulary. Students can do this activity on their own.
- Ask them to read a newspaper article and substitute every 7th word with a different but appropriate word.
- Ask them to give feedback on emails/ reports/ proposals in the classroom in pairs or groups.
- Ask the students to write a report after collecting scraps from newspapers, reports, and video clips, etc. on topics related to science and engineering, for example, global warming or earthquakes, etc.

References

Abeywickrama, R. (2010). An analysis of errors in English writing of Sinhala speaking undergraduates. *Sabaramuwa University Journal, 9*(1), 97-114.

Alinsunod, J. (2014). A study on common writing errors of engineering students: A basis for curriculum development. *European Journal of English Language and Literature Studies 2*(3), 7-15.

Aziz, Z. A., Fitriani, S. S., & Amalina, Z. (2020). Linguistic errors made by Islamic university EFL students. *Indonesian Journal of Applied Linguistics, 9,* 733-745. doi: 10.17509/ijal. v9i3.23224

Bodunde, H. A., & Sotiloye, B. S. (2013). Critique of undergraduate students' writing skill in an ESL setting: samples from the Federal University of Agriculture, Abeokuta, Nigeria. *World Journal of English Language, 3*(2), 10-21.

Buriro, G. S., & Soomro, A. F. (2013). Assessing the academic literacy and learning needs of undergraduate engineering students at Quaid-e-Awam University of Engineering, Science and Technology (QUEST) Pakistan. *Journal of Research and Reflections in Education, 7*(2), 83-96.

Corder, S. P. (1967). The significance of learners' errors. Reprinted in J. C. Richards (ed.) (1974, 1984) Error Analysis: Perspectives on Second Language Acquisition. Longman: London, pp. 19 - 27 (*Originally in International Review of Applied Linguistics*, 5 (4).

Crompton, P. (2011). Article errors in the English writing of advanced l1 Arabic learners: The role of transfer. *Professional Teachers' Article*, 50, 1-33.

Crystal, D. (1980). *A first dictionary of linguistics arid phonetics*. Andre Deutsch: London.

Ellis, R. (1994). *The study of second language acquisition.* Oxford: Oxford University Press.

Fatima, S. (2012). Teaching report writing skills through communicative activities. *American International Journal of Contemporary Research, 2*(2), 104-109.

Jayasundara, J. M. P. V. K., & Premarathna, C. D. H. M. (2011). A Linguistic Analysis on Errors Committed in English by Undergraduates. *International Journal of Scientific and Research Publications, 1*(1), 1-6.

Judith, M. P. et al. (2014). Error analysis in English written essays of undergraduate students of Northeast Normal University Changchun. *Language in India, 14*(5), 123-146.

Milke, M. et al. (2013). Improving the writing of engineering students through portfolios. *American Society of Civil Engineers*, 1-12.

Ngaada, Z.Y., & Nwoke, A. (2014). An analytical study of errors in the written English of

undergraduate engineering students, ATBU: a case study. *Journal of Education and Practice, 5*(38), p. 8-16.

Riaz, M. (2021). Deviation from the standard pronunciation of English: 350 words in Pakistani English. *Journal of Language and Linguistic Studies, 17*(3), In Press.

Riaz, M. (2019). Language variation: Code-mixing and code-switching in Pakistani commercials. 15(2), 411-419. DOI: 10.17263/jlls.586085

Riaz, M. (2015). Pakistani English: Deviant pronunciation of English words by uneducated native Punjabi speakers. *Journal of Second and Multiple Language Acquisition-JSMULA, 3*(2), 23-33.

Riaz, M. (2013). Task-based language learning in English for specific purposes: An exploration into the use of newspapers for teaching English as a second language to engineering students in pakistan. *The Journal of Teaching English for Specific and Academic Purposes,* 2(4), 685-696.

Riyaz, R. (2014). Exploring through errors: An error analysis of chemical engineering students' technical project reports. *Language in India, 14*(1), 70-82.

Salehi, M., Bahrami, A., Groth, H., (2018). An error analysis of journal papers written by Persian authors. *Cogent Arts and Humanities, 5*(1), https://doi.org/10.1080/23311983.2018.1537948

Santos, L. M. D. (2019). English language learning for engineering students: application of a visual-only video teaching strategy. *Global Journal of Engineering Education, 21*(1), 37-44.

Sattayatham, A., & Ratanapinyowong, P. (2008). Analysis of errors in paragraph writing in English by first year medical students from the four medical schools at Mahidol University. *Silpakorn University International Journal, 8*, 17-38.

Titchenelle, K. (2011). The three most common English language errors made by non-English speakers. *Abacus English Editing Services, 20*. Retrieved from www.abacus-es.com