

# Research Supervisors' Perceptions of PhD Scholars' Writing Difficulties across Engineering Disciplines: A Qualitative Study

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## ABSTRACT

*This study reports the writing difficulties of 54 PhD scholars in the field of engineering, as reported by a pool of research supervisors from three engineering colleges in Tamilnadu. The data has been collected through semi-structured interviews and themes and patterns have been identified and analysed quantitatively. Specific difficulties in the areas of grammar, vocabulary, cohesion and coherence and other features of style have been highlighted with examples. It also proposes recommendations for improving the writing skills of PhD scholars.*

**Keywords:** Writing skills, difficulties, engineering research reports, PhD Theses, Supervisors' perceptions

## I. INTRODUCTION

Generating quality research documents entails drafting technical documents, synthesizing earlier research, presenting the data analysed and results, conclusions arrived at. These observations, facts and results are to be presented with the same level of clarity and intent as it was originally conceived, observed and analyzed by the researcher. Composing clear and quality research reports appears to be more challenging for scholars in the fields of engineering. The reasons for this could be any (one or many) of the following: a) poor language training in their UG and PG studies b) inadequate grasp of the essentials of academic writing c) insufficient time to revise their documents amidst the rigours of research d) tendency to delve more towards precision and accuracy of measurements than towards that of language. Therefore, these scholars either seek the help of professional writing services or resort to language professionals for help. We presumed

that gathering the perceptions of those supervisors who assist and edit their research documents and studying them qualitatively would offer some insights into the problems and the relevant solutions.

## II. LITERATURE SURVEY:

The very process of writing involves careful consideration of the audience, the relationship between readers and writers of theses and dissertations, a general understanding of expectations and conventions and requirements of a particular discourse community (Paltridge 2019). Writing a PhD thesis involves acquiring a complete set of "craft skills" or "authoring skills" which are "fundamental to achieving a coherent joined-up argument" (Dunleavy, 2003). Hyland rightfully highlights the variations in academic writing based on genre as well as disciplines (Hyland, 2002). Generally, scholars in sciences and engineering tend to receive less practice in writing when compared

to those in humanities and social sciences (Kayfetz and Almeroth, 2008).

Acknowledging the importance of writing English across different disciplines for more than a decade, engineering colleges in India have been working on revamping the general, literature-oriented English curriculum into a syllabus focusing on technical communication. Some autonomous colleges have also been assigning sufficient practice in writing term papers and assignments in their UG and PG levels. To prepare candidates even at the ME level, audit courses on “English for research writing” have been introduced in some of the autonomous institutions. Despite all these efforts, the need for improving writing skills is being constantly felt by academicians, supervisors and scholars themselves, leading them to seek the help of professional editing services or to enrol themselves in language training programs during their PhD tenure. Though a few studies have focussed on studying the writing difficulties, we assumed that the first-hand gathering of perceptions of supervisors related to their scholars’ writing skills would throw some light on the common language problems faced by PhD scholars in the field of engineering. Further, an insight would help us understand the relationship between the two and arrive at conclusions about improving their writing skills.

### **III. RESEARCH QUESTIONS:**

The study aimed at understanding the written competencies of PhD scholars first hand and the perceptions of supervisors related to their scholars’ writing skills. The research scholars considered for the study were doing their PhD under these supervisors’ guidance and were in different stages of their research.

*The study addressed the following research questions:*

- a) What are the supervisors’ perceptions of writing problems that their scholars have?
- b) Which items of language pose more difficulties to scholars while they write their research papers?

### **A. Research Design**

Both the scholar pool and the supervisor pool were chosen from volunteers from three leading engineering colleges in Tamilnadu, India, namely PSG College of Technology, CIT and Bannari Amman Institute of Technology, Sathyamangalam. This supervisor pool of 48 members belonged to the following five main branches of engineering: Electrical and Electronics Engineering (EEE), Electronics and Communication Engineering (ECE), Mechanical, Civil and Textile Engineering. Only supervisors from basic Engineering branches were considered owing to the following reasons:

1. In all the three institutions taken up for investigations, these basic Engineering departments are well established. New branches do not have solid research departments with a good publication profile. So collecting the pool of supervisors and scholars could have been a little difficult
2. Both the authors are familiar with these supervisors since they have been working together for more than 15 years in the same institutions and hence, could get their consent to participate in the study.

The research scholars considered for the study were doing their PhD under these supervisors’ guide ships and were in different stages of their

research. A total of 86 research scholars across different branches of engineering volunteered for the study. The study employed qualitative analysis of data gathered through unstructured interviews

### B. Supervisors: Interviews

Since research supervisors are primarily

responsible for moulding and guiding scholars and correcting/revising their candidates' works, we felt that it was important to understand their perceptions about the difficulties their scholars' face. Most of these research supervisors were in the age group of 40-55 and details of their experience, number of years and scholars working under them are tabulated below:

**Table 1 : Profile of research supervisors**

No of years of experience	1-5	6-10	More than 10
No of scholars guided	5	9	13-16
No of thesis evaluated	2	10	21-25

### IV. Research Methodology:

We conducted semi-structured interviews to elicit more precise and accurate responses from these supervisors to understand in detail the difficulties they face while evaluating or editing their scholars' works.. Though the interviews had a clear structure to begin with, through the course of the interview, more probing questions were added to obtain a richer sample with more examples. The questions are presented in Appendix A. These naturalistic and authentic responses helped us to collect adequate

examples to substantiate their response.. These interviews helped to gauge their perceptions of their scholars' level of competence. The data was reduced, traced for themes and codes were assigned for the same. The coding process was done by both the researchers and to ensure accuracy of responses, a third coder was also involved. The writing difficulties expressed by them were categorised as vocabulary (V), Grammar (G), Flow, Cohesion and coherence (FCC), Metadiscourse (MD), Mechanics (M). The results are presented in Table 4

**Table 2: Themes and no. of codes for supervisor interviews**

	Themes	No of codes
a	Vocabulary (V)	34
b	Flow, Cohesion and coherence (FCC)	29
c	Grammar (G)	19
d	Metadiscourse (MD)	6
e	Academic style (FAS)	6
f	Word order and structure (WS)	4
g	Mechanics (M)	2

Some of the sample protocols are given below to explain how categorising of codes and themes were done. Owing to the length of responses, not all of them are presented

#### **a)Vocabulary (V):**

S1: No variety in reporting words.... They always use “stated”, “mentioned”, “studied”. When there are other words like “conduct/investigate/analyse/study/assess/survey” to be used.S4: Some research scholars use over-dramatic language: for example “dangerous effects” instead of “undesirable or unprofitable or problematic results” ..(unless it is something fatal)

S5: Most scholars use words inappropriately: When they say “something emulates human vision, it is wrong “ – one can only emulate functions of human vision but not emulate vision itself”

S6: Can’t interpret and say in clear terms what their data says : they simply say “increased much” “decreased a lot”...”...the degree of increase or decrease are not expressed in clear words”

sS23"“They don’t use right words in the right place”

S43: They define terms as what they would do in a class..for example instead of writing “the term bull market refers to”, they write things like “Bull market is when...”

S6: They use wrong adjectives “Sensible” (human) instead of “sensitive” (properties);”Inborn defects” instead of “inherent defects”

S9:They use wrong words to describe : for example “ Highly being used” - “instead of

widely being used”

S14: Use simple words like “very easy “ : a better technical word is flexibility or ease of handling

S11: Words are either too simple or too complex”. For example, Particles had impurities. The functionality of the machine had increased after the addition of “.

“... I had to ask them what it meant... they are precise in measurement not in their language. We know it is not right”. Eg: Previously instead of formerly

S33: They use wrong and very high school essay words in a research paper: They write “ Small small dimples” instead of “ Numerous little dimples” ...S34: They use words wrongly: For example, Industry doesn’t want to spend” instead of “ Industries are not very willing/enthusiastic about spending”

S37: Choice of words I always a problem.For example, they write “ wrinkles “comes” instead of ““wrinkles tend to occur/appear”

S45: Use same words repeatedly..Throughout their thesis, they write “incurs more cost” while we have alternatives like “ it is not very cost-effective “ or “ due to constraints of cost”

#### **b) Flow, cohesion and clarity (FCC)**

S4: “They don’t show connections between one sentence and the next”. S13: I don’t find words like next, first, in conclusion, etc.

S14:.: Many times, I can’t see the beginning, middle or which is the end. Prose doesn’t flow” S16 had to say this: “Structure is improper” (S)..so there is no flow”

S 7: Sometimes what they write gets stuck...it

doesn't flow...smoothly ..no harmony in the way it is written"

S 8: "Too many 'These' and 'Those' ... they can mean many items, don't know what that 'these' refers to –.

S10: "Sequence not properly established through words" S12: The paragraphs don't have a linear structure

S32: Use the word "on the other hand" "but the earlier paragraph doesn't have the phrase "on the one hand" same for "latter" being used without "former"

S45: The link between paragraphs and sometimes even chapters are missing S43: "Many times before correcting I had to ask if this is what they meant .....that clarity was missing"

S33: "Their writings are foggy because I can't see a proper shape to the research work"

### c) Grammar (G)

S4: "Repeat sentences without structure". ...." Same sentences occur both in Results, Discussion and Conclusion"

S7: "Suddenly within the same sentence, they move from active to passive voice" S8: "Errors in the article" use the so many times unnecessarily...

S9: "Errors in Prepositions"

S24: They don't take care of even basic subject-verb things you know... They have problems with basic subject-verb agreement ..for example: "A precipitate was formed/will get increases/we can able to see/will take place/is taking place/will make lower toxicity/"

S30: Use "Prepositions" as 'Adjectives'.

Example, "above- figure" "below figure"

S43: Sentences are of the same type..without variety..it is very boring to read..most of them read like BE students assignments on semiconductors!

S13: Wrong use of adjectives in place of verbs is something I see often. For example, they write things like "How depth the wrinkle is /how length the wrinkle is ..." instead of "How deep the wrinkle is and how long the wrinkle is"

S8: They clutter many nouns instead of expanding: eg.: circumferential pressure distribution/ Performance investigation instead of "Distribution of Circumferential pressure/ investigation of performance"

**d) Metadiscourse (MD):** Metadiscourse can be defined as "the range of devices writers use to explicitly organise their texts, engage readers, and signal their attitudes to both their material and audience (Hyland and Tse, 2004). This refers to providing reader directions and orientations primarily so that the text flows smoothly and lucidly.

S:34 "No clear indication of directions to the reader – readers are taken for granted"

S:8 "There are no sentences to help readers identify what can be found in each chapter, or their thesis... the reader orientation is missing"

S 30: "use abbreviations without explaining them or expanding the,,it is like taking the reader for granted

S19 : Use very careless words in paragraphs such as "like it was mentioned earlier, as can be seen .."

### e) Formal Academic style (FAS)

S4: They write as they talk, using local language..

Use a lot of colloquial words like “ a lot, somewhat small” etc in

S: 29 “They write in the same manner as they talk”. Eg: They use very informal style : “bring down” for “ minimising /reducing or totally eliminating”

S17: Use phrases like “ like it was mentioned earlier, as can be seen”

S14 : Instead of writing, ” this figure refers to or this mechanism is an indication, they use vague and informal words like the following : “this means, it is having , for that , this one is , this shows...”

S34: Many of them write school essays instead of research articles..the tone is as if they are talking to a classmate for explaining things to a labourer in the lathe or lab attendersS24: Many times they write very casually: “They write things like ‘It will result in more friction, load and wear and tear” instead of “ it produces certain undesirable effects such as more friction, load and wear and tear”

#### **f) Word order and Structure (WOS)**

S14: They don’t keep related words/phrases together, .they write sentences like this:

“ With the ubiquity of new information technology and media, more effective methods for HCII are being developed which rely on higher level image analysis” instead of With the ubiquity of new information technology and media, more effective methods for HCII which rely on higher level image analysis techniques are being developed

S15: I have to really look for a connection between parts of a sentence..noun parts are scattered all over the sentence

#### **d) Mechanics (M):**

S3: “Poor Spellings are very irritating at times”

S1: They use ‘Dashes’ and ‘Hyphens’ in wrong places or never use them. Example

“Frequency-tunable, portable - Piezoelectric Energy Harvester”

S7:They write: “discreet” for “discrete” and the spell check doesn’t correct it!

#### **V. CONCLUSIONS & RECOMMENDATIONS**

The analyses of data from their PhD supervisors about the writing difficulties further indicate that the expectations of supervisors and the general academic community at large demand C1 level writing skills. We would also like to recommend that scholars are made to take some intensive language training programmes, which would begin with diagnosing their levels and then proceed to tailored research writing programmes before they actually start drafting their thesis. An intensive course in academic writing with due credits in their course work in the first year of their PhD would also help. Further support for academic writing can be offered through mentorship programmes, setting up writing centres in institutions with the help of language departments, assigning language mentors etc.

#### **V. Limitations of the study and scope for Future work:**

Owing to limitations of time, we took to the interview mode of data collection. A wider sample of scholars’ writings and a quantitative analysis of data could have yielded richer and more reliable data. Some of the PhD supervisors interviewed were not exposed to principles

/practices of research writing themselves. Hence, it is difficult to know if they could articulate the actual difficulties and if coders captured their responses in their entirety. This might have reflected on our coding, which might not be 100% accurate. Future research work can focus on testing wider samples. Yet another study could be based on supervisors' rating of scholars writing difficulties based on supervisors' seniority levels. Further, studying successful and unsuccessful writing strategies of research scholars could be another area of research.

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### Appendix A

#### Interview Questions with PhD supervisors: Sample

1. Tell me about yourself in brief. (How long have you been guiding students for PhD research?)
2. What kinds of challenges do you face while reading your scholars' theses?
3. Where do you think scholars have a lot of difficulty with? Vocabulary, grammar or any other aspect? Can you recall some examples?
4. When you evaluate PhD thesis as an external examiner, what difficulties in scholars' writings do you come across?
5. Have you felt frustrated while reading the PhD theses of your scholars or others that came to you for corrections? Were these frustrated because of their use of language?
6. What do you do while you encounter these errors? Can you think of examples?
7. What do you do to remediate some of these mistakes?
8. According to you, what steps can be taken to handhold these scholars in their process of research writing?

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