



The invisible author? Factors impacting authorial presence in professional engineering written reports

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ABSTRACT

CONTEXT

Equipping engineering students with appropriate professional writing skills requires supporting them to manage their authorial presence in variable contexts. The visibility (or invisibility) of the author is constructed by language features including personal pronouns, verb choices and active and passive voice, and varies according to academic discipline and context. Adopting an appropriate level of author visibility can be a challenge for students (Luzon, 2009). Even when given a realistically professional writing task, students can adopt an authorial presence more similar to that of a journal article than a professional report. Students may generalise writing 'rules' to all contexts, hold misconceptions about both language and engineering practice, and lack exposure to professional writing (Conrad 2017).

PURPOSE AND METHODOLOGY

This study measures indicators of author visibility in a corpus of professional engineering reports using a mixed methods approach. Language features of interest were identified through a qualitative analysis of interpersonal language use in the corpus, drawing on Martin and White's (2005) Appraisal framework, followed by a quantitative analysis using Corpus Linguistics methods.

FINDINGS AND CONCLUSION

The findings show that professional writers tend to make linguistic choices which reduce the visibility of the author, confirming previous research. Verb choices commonly frame viewpoints as considerations, expectations or recommendations rather than overtly signalling that an argument is being made. Passive voice is a dominant choice and personal pronouns are mostly absent. However, in some contexts author visibility is increased, such as when the writer takes an independent advisor role, is the sole author or the report involves a site investigation.

These results have implications for teaching writing to engineering students. Students require specific coaching around their choices as an author in different contexts. Increasing exposure to professional writing in addition to academic research would also aid students to make appropriate choices in accordance with their purpose for writing.

KEYWORDS

Professional writing, Author Visibility, Appraisal, Corpus Linguistics

Introduction

Equipping engineering students with appropriate writing skills for their future professional contexts involves enabling them to skilfully manipulate a range of often implicit linguistic cues that establish an author's expert status and credibility with their readers (Kmiec & Longo, 2008, p. 93). Among these cues is the appropriate extent to which the author is seen as present in the text, which varies according to context and purpose for writing. The visibility of the author, or lack thereof, is constructed by language features including personal pronouns (Hyland, 2001; Tang & John, 1999), verb choices and active and passive voice (Conrad, 2017).

Academic disciplines vary in their preferences for author visibility, which may relate to a wide range of document purposes and different identify roles taken by the writer (Flottum, Kinn & Dahl, 2012; Tang & John, 1999). However, little research in this area has been conducted specifically within engineering. A number of studies identify that use of passive voice is common (Carmichael et al., 2012; Conrad, 2017; Ding, 2001; Fakhrudin & Attan, 2013; Poltavtchenko, 2013; Rus, 2015; Sales, 2006) and that use of personal pronouns is infrequent (Carmichael et al., 2012; Clippinger et al., 2019; Gardner & Xu, 2019; Poltavtchenko, 2013). On the basis of these studies, it might be concluded that engineering as a discipline tends to present a low level of author visibility, possibly due to an association between minimising author visibility and the desirability of being perceived as 'objective' (Couture, 1992; Sales, 2006), as well as the absence of a need to justify the reason for writing in industry as is necessary in academic journal articles (McKenna, 1997). However, some studies note that human agency is foregrounded at times when it is necessary to make responsibility or liability explicit (Conrad, 2017, p. 65).

Adopting an appropriate level of author visibility for a particular context can be a challenge for students, particularly for those for whom English is an additional language (Luzon, 2009). Even when given a writing task linked to a realistic professional context, students can adopt an authorial presence more similar to that of a journal article than a professional report. This failure to adapt writing style to context could be because students generalise writing 'rules' to all contexts, hold misconceptions about both language and engineering practice, and lack exposure to professional writing (Conrad, 2017). At the same time, engineering lecturers may feel ill-equipped to explicitly teach writing practices (Strauss & Grant, 2018) or view writing as separate from engineering practice (Goldsmith et al., 2019).

Research on engineering writing has often been grouped together with the hard sciences (Rau, 2021). Additionally, there is little separation of academic and professional writing in the research, despite acknowledged differences (Sherwood, 2004), and also substantial variations within both areas (Gardner & Xu, 2019). Furthermore, of the research that has been conducted into engineering writing in particular, the majority has focused on data drawn from educational and academic contexts, such as student assignments and published journal articles. There is therefore a need for a research focus on professional writing.

This study seeks to contribute to understanding of professional engineering writing style by investigating indicators of authorial presence in reports written by industry practitioners. This understanding can then be used to inform teaching materials and curriculum development in engineering programs.

Methodology

The study from which this paper is derived uses a corpus consisting of 26 publicly available engineering reports, comprising 1,391,655 words in total. The texts were selected for inclusion in the corpus on the basis that they were written by a professional engineer in Australia after 2010, and were written for the broadly defined purpose of reporting to a client or governing body prior to commencement of a proposed project, to determine the need for engineering work or to advise on design requirements. The document types include environmental impact statements, traffic impact statements, a range of investigation reports and structural condition reports. These reports have the advantage of being publicly accessible, unlike other types of engineering documents which are

engineering texts when compared to the reference corpus, in this case a corpus of general written British English. A second function of the concordance is the Key Word in Context (KWIC) tool, which enables keywords of interest to be listed and examined in the context of their surrounding text. The keyword tool, with support from the KWIC tool, was used to investigate the statistical representation of the constructions conveying pronouncements of a stance as identified in the qualitative engagement coding. Additionally, as a second indicator of authorial presence, the use of personal pronouns was analysed using the concordancer. Keyness is statistically measured by Log-Likelihood (LL) (Dunning, 1993) which is considered by many corpus linguists as the preferred method of calculating keyness (McEnery & Hardie, 2011, p. 52). The threshold for statistical significance was set at $p < 0.05$ (3.084 in LL values), the generally accepted threshold for claiming statistical significance across multiple disciplines (Collins, 2019, p. 69).

Results and Discussion

The results of the analyses demonstrate that in general, engineering writers make choices which reduce the visibility of the author when presenting viewpoints, as in this example:

It is considered that the Project has identified and mitigated potential environmental impacts to a level that will allow for the significant benefits of the Project for the local and regional communities to be sustainably realised (Umwelt 2012, section 7.5).

This result confirms those of the studies cited above. In terms of the qualitative coding of engagement resources, the most frequent constructions coded as indicating the category of pronouncement are listed in Table 1, with the most common verb form first and less common in brackets.

Table 1. Common codings of pronouncement

Construction	Number of instances
<i>considered (consider)</i>	64 (1)
<i>expected</i>	40
<i>anticipated (anticipate)</i>	34 (2)
<i>recommended (recommend) (our recommendations)</i>	16 (6) (2)
<i>estimated (estimates)</i>	21 (1)

The results of the qualitative coding are triangulated by those of the concordance analysis, in terms of the listing of statistically significant keywords. Each of these top five expressions qualitatively coded as pronouncement are found to be statistically overrepresented in the whole corpus when compared to the reference corpus. The constructions, their keyword rankings and LL scores are shown in Table 2. Lower keyword rankings indicate stronger keyness, as determined through the higher LL scores, which are notably well above the threshold for statistical significance.

Table 2. Concordance results

Construction	Keyword ranking	LL score
<i>considered</i>	73	969.614
<i>expected</i>	104	714.77

<i>anticipated</i>	220	396.329
<i>estimated</i>	227	380.605
<i>recommended</i>	533	163.544
<i>recommendations</i>	686	123.305

These results indicate lower levels of author visibility across the corpus as, firstly, these common choices reduce the impression of the viewpoint presented as an argument presented by the author. As such, these verb choices position the author as somewhat distant or detached from their pronouncements, increasing the sense of objectivity in the writing style. Secondly, passive voice is the most common verb form used, removing the human agent as the source of any action or thought process. The absence of other possible choices, *argue*, *contend*, *assert* and *claim* was confirmed by searching specifically for these terms. The search returned only 2 instances of *argue* and 1 of *contend* in the entire corpus. Similarly, searches for *think* and *believe* returned only 2 and 12 instances respectively.

Additionally, the concordance analysis indicates a statistically significant lack of personal pronouns across the corpus. Table 3 lists the top twenty words which are less likely to occur in the engineering reports in comparison to the general English corpus. The lower numbers correlate to the most statistically underrepresented words. Personal pronouns are highlighted in the table by the shaded rows. It should be noted that the word *they* is not shaded, as investigation of this item through the KWIC tool showed that this is primarily used as a reference pronoun for non-human entities, rather than as a personal pronoun.

Table 3. Concordance results for negative keywords

Word	Ranking	Word	Ranking
he	1	my	11
I	2	but	12
his	3	said	13
you	4	what	14
her	5	me	15
she	6	they	16
had	7	who	17
we	8	like	18
was	9	them	19
it	10	your	20

These results indicate that while personal pronouns do occur in the corpus, they do so with much less frequency than in general written English. Further exploration of individual use of these pronouns through the KWIC tool also led to some informative observations. For example, the pronoun *he* occurs only 14 times in the corpus of over a million words. Investigation of these instances through the KWIC tool revealed they all referred to someone other than the author of the

text, for example, someone responsible for maintenance of a piece of machinery under investigation, or an investor in a project.

The findings so far have indicated that, when taken as a whole, the corpus displays a relatively low level of author visibility. However, there are some differences when individual reports are compared, which can lead to the identification of some contexts in which author visibility is somewhat increased. Other findings from the larger project have been used to identify a contextual variation within the corpus, as some reports are written for the purpose of seeking approval for a proposed project, while in others the purpose is to give advice as an independent expert (Simpson-Smith, 2021a, 2021b). The search results for uses of 'we' in context highlight differences between the giving advice and seeking approval contexts. 39 hits for 'we' were found throughout the corpus, used in several expressions which present a viewpoint including *we believe*, *we do not consider*, *we recommend* and similar, as in the following example.

We do not consider the building to be structurally safe. [...] We would strongly recommend that when the building is demolished, that it be dismantled and the salvageable heavy timbers retained for recycling rather than just being sent to landfill (Tonkin 2016, p. 2).

Of these 39 hits for *we*, 30 instances are in reports identified as giving advice purposes. This finding indicates that author visibility is slightly increased in contexts in which the writer takes the role of an independent advisor. These reports are also more commonly written by a single author who in some cases signs the report at its conclusion, at times acting on behalf of their team and/or company. Several of these documents report on the results of a site investigation, and in several of these cases personal pronouns are used in a way that foregrounds the person conducting the actions of the investigation, as in the following examples.

We measured the existing building and developed the attached Plan and Section drawings of the Roundhouse. [...] Our measure up and inspections were limited to an 'at ground' view only for the purposes of this report (Tonkin 2016, p. 1) .

Based on our inspection and desktop study, Bathers Pavilion is in very poor condition overall and has a high level of risk due to its current condition (Cardno 2018, p. 22)

These examples confirm the findings of Conrad (2017) in terms of using personal pronouns and active voice to make liability explicit. On the basis of these results, it may be concluded that contextual factors which may lead to an increase in author visibility include whether the document is written by an engineer working alone or in a small team to conduct an investigation and provide subsequent advice, or by a larger team in the context of a project planning process.

Conclusion and Recommendations

In summary, this paper has demonstrated that author visibility in professional written reports is generally low, with viewpoints framed as considerations, expectations or recommendations rather than explicitly as arguments. Author visibility is reduced through the author's choices of verbs in relation to viewpoints, frequent use of passive voice and avoidance of personal pronouns. However, certain contextual factors were identified as correlating with an increase in author visibility. Personal pronouns and active voice are used more often when the author takes an independent advisor role, when the report is related to a site investigation, when there is a need to make responsibility explicit and when a sole author is named.

These findings have implications for teaching writing to engineering students. Teaching materials on writing for engineering need to reflect actual engineering practice, and avoid generalising from writing rules appropriated from other disciplines. For example, many textbooks on technical writing advise against using passive voice (Wolfe, 2009). Given the findings of this project, such advice is likely to mislead students. Similarly, general warnings to avoid personal pronouns in order to achieve an impersonal style could be misleading by obscuring contexts in which clarity and explicitness of human responsibility is necessary for reasons of liability.

Three recommendations are made in relation to teaching engineering students the skills they need to manage their authorial presence appropriately for the workplace. Firstly, it is recommended that writing tasks throughout engineering programs are contextualised to reflect the realities of the industry. For example, writing activities can be framed in a way that necessitates an understanding of the social context of a project, including the purpose for writing, any regulatory constraints, the nature of the audience needs and expectations, and the possible ways in which the document may be used in the future.

Secondly, it is recommended that explicit instruction be given on the language features that construct author visibility, both in terms of academic writing and with reference to professional practice. An example of such instruction could be to provide students with some example texts, annotated to highlight the verb choices, active and passive voice and personal pronouns. Prompt questions can guide students to consider the extent to which these language features are used, and reflect on the reasons why the text was written in this style. Clearly linking these language features to the reality of engineering practice and the potential negative reactions from clients if their writing style is inappropriate can help students appreciate the reasons for learning about language.

Finally, it is recommended that students are exposed to contemporary industry writing practices, including a range of documents serving varied purposes and written for different purposes. Reading professional writing alongside academic writing will help to raise student's awareness of how writing style may differ when they move from the academic context to the professional.

The limitation of the focus of this study to professional writing enabled a depth of exploration of the linguistic features of the corpus and contributes to addressing the lack of research in this area. However, this focus also means that the findings are limited only to professional writing. Further research is needed to compare these findings to engineering research and student writing in order to further deepen understanding of the use of author visibility as it may vary across the discipline.

References

- Anthony, L. (2019). *AntConc 3.5.8*. In Waseda University. <https://www.laurenceanthony.net/software>
- Cardno. (2018). *Structural condition assessment of Sans Souci Bathers Pavilion*. Sydney: Cardno.
- Carmichael, S., Wu, K.-Y., & Lee, J. (2012). Designing and evaluating a genre-based technical communication course incorporating a task-based model of instruction. *Hong Kong Journal of Applied Linguistics*, 14(2), 20-44.
- Clippinger, D., Jernquist, K., Nozaki, S., & Nitterright, F. (2019, June 16-19, 2019). *Improving undergraduate STEM writing through common language as a tool to teach engineering "dialects"* American Society for Engineering Education 126th Annual Conference & Exposition, Tampa, Florida.
- Collins, L. (2019). *Corpus linguistics for online communication a guide for research*. London: Routledge.
- Conrad, S. (2017). The use of passives and impersonal style in civil engineering writing. *Journal of Business and Technical Communication*, 32(1), 38-76. <https://doi.org/10.1177/1050651917729864>
- Couture, B. (1992). Categorizing professional discourse: Engineering, administrative, and technical/professional writing. *Journal of Business and Technical Communication*, 6(1), 5-37. <https://doi.org/10.1177/1050651992006001001>
- Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches* (4th ed.) California: SAGE.
- Ding, D. (2001). Object-centered: How engineering writing embodies objects: A study of four engineering documents. *Technical Communication*, 48(3), 297-308.
- Dunning, T. (1993). Accurate methods for the statistics of surprise and coincidence. *Computational linguistics - Association for Computational Linguistics*, 19(1), 61.
- Fakhrudin, W.F.W.W., & Attan, A. (2013). Putting knowledge gained into practice in civil engineering lab reports. *Procedia - Social and Behavioral Sciences*, 70, 1501-1512. <https://doi.org/10.1016/j.sbspro.2013.01.218>

- Flottum, K., Kinn, T. & Dahl, T. (2012). "We now report on..." versus 'Let us now see how...': Author roles and interaction with readers in research articles. In K. Hyland & M. Bondi (Eds.) *Academic Discourse Across Disciplines* (pp. 203-224). Bern: Peter Lang GmbH, Internationaler Verlag der Wissenschaften.
- Fuoli, M. (2018). A step-wise method for annotating APPRAISAL. *Functions of Language*, 25(2), 229-258. <https://doi.org/10.1075/fo1.15016.fuo>
- Gardner, S., & Xu, X. (2019). Engineering registers in the 21st century: SFL perspectives on online publications. *Language, Context and Text*, 1(1), 65-101. <https://doi.org/10.1075/langct.00004.gar>
- Goldsmith, R., Willey, K., & Boud, D. (2019). Investigating invisible writing practices in the engineering curriculum using practice architectures. *European Journal of Engineering Education*, 44(1-2), 71-84. <https://doi.org/10.1080/03043797.2017.1405241>
- Halliday, M. A. K., & Matthiessen, C. M. I. M. (2014). *Halliday's introduction to functional grammar* (4th ed.). Abingdon: Routledge.
- Hyland, K. (2001). Humble servants of the discipline? Self-mention in research articles. *English for specific purposes*, 20(3), 207-226. [https://doi.org/10.1016/S0889-4906\(00\)00012-0](https://doi.org/10.1016/S0889-4906(00)00012-0)
- Kmiec, D., & Longo, B. (2008). *The IEEE guide to writing in the engineering and technical fields*. New Jersey: John Wiley and Sons. <https://doi.org/10.1002/9781119070269>
- Luzon, M. J. (2009). The use of we in a learner corpus of reports written by EFL Engineering students. *Journal of English for Academic Purposes*, 8(3), 192-206. <https://doi.org/10.1016/j.jeap.2009.04.001>
- Martin, J. R., & White, P. R. R. (2005). *The language of evaluation: Appraisal in english*. New York: Palgrave Macmillan.
- McEnery, T., & Hardie, A. (2011). Accessing and analysing corpus data. In (pp. 25-56). <https://doi.org/10.1017/CBO9780511981395.003>
- McKenna, B. (1997). How engineers write: an empirical study of engineering report writing *Applied Linguistics*, 18(2), 189-211.
- O'Donnell, M. (2007). *UAM Corpus Tool*. In Universidad Autonoma de Madrid.
- Poltavtchenko, E. (2013). *Engineering design reports in upper-division undergraduate engineering courses and in the workplace*. [Doctoral dissertation, Northern Arizona University].
- Rau, G. (2021). Development of component analysis to support a research-based curriculum for writing engineering research articles. *English for specific purposes*, 62, 46-57. <https://doi.org/10.1016/j.esp.2020.12.001>
- Rus, D. (2015). Developing technical writing skills to engineering students. *Procedia Technology*, 19, 1109-1114. <https://doi.org/10.1016/j.protcy.2015.02.158>
- Sales, H. E. (2006). *Professional communication in engineering*. London: Palgrave Macmillan UK.
- Simpson-Smith, C. (2021a). Persuasion in engineering reports: Evaluative resources and targets in practice'. *Journal of Research in Applied Linguistics*, 12(6), 6-21.
- Simpson-Smith, C. (2021b). *Writing objectively: Functional grammar as a tool to improve engineering students' writing style* Research in Engineering Education Symposium & Australian Association for Engineering Education Conference, The University of Western Australia, Perth.
- Strauss, P., & Grant, L. (2018). 'We mainly deal with maths': New Zealand engineering lecturers' and students' perceptions of 'engineering writing'. *New Zealand Studies in Applied Linguistics*, 24(2), 1-11.
- Tang, R., & John, S. (1999). The 'I' in identity: Exploring writer identity in student academic writing through the first person pronoun. *English for Specific Purposes*, 18, S23-S39. [https://doi.org/10.1016/S0889-4906\(99\)00009-5](https://doi.org/10.1016/S0889-4906(99)00009-5)
- Tonkin Consulting. (2016). *Mount Gambier roundhouse: Engineers assessment report*. Mount Gambier: Tonkin Consulting.
- Umwelt (Australia). (2012). *Cooma Road Quarry continued operations project environmental impact statement*. Newcastle: Umwelt (Australia) Pty Limited.
- White, P. R. R. (2012). Exploring the axiological workings of 'reporter voice' news stories-Attribution and attitudinal positioning. *Discourse, Context & Media*, 1, 57-67.

Wolfe, J. (2009). How technical communication textbooks fail engineering students. *Technical Communication Quarterly*, 18(4), 351-375. <https://doi.org/10.1080/10572250903149662>

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