Improving Disciplinary Literacy by Developing Vocabulary and Grammatical Profiles

Clarence Green and James Lambert

KEY IMPLICATIONS

- We contributed to the knowledge and understanding of Disciplinary Literacy in the Singapore context by building and analysing a corpus of secondary school reading material.
- Disciplinary Literacy refers to the language, conceptual presentation and meta-cognition relating to a particular discipline. We produced an empirical description of key vocabulary that is important to eight different disciplines. These resources are the Secondary Vocabulary Lists and the Secondary Phrase Lists.
- We provide the most common vocabulary, phrases, and lexico-grammatical patterns that students need to learn so as to read and write in the particular style of different disciplines.

BACKGROUND

Disciplinary Literacy is a research area and pedagogical approach in secondary education that focuses on developing awareness in learners of language variation across disciplines. The approach is being adopted by K-12 educational systems worldwide (Shanahan & Shanahan, 2008). It shares much in common with recent trends in English for Specific Purposes (Hyland, 2017); e.g. both emphasize the language used for conceptual access varies by discipline and question the utility of general literacy/general academic vocabulary.

FOCUS OF STUDY

We argue that existing wordlists do not represent the lexical demands of secondary students. We conducted a large-scale project aimed at developing academic vocabulary lists for secondary school context, thereby expanding the current methods of corpus-based vocabulary research into new contexts. The work is unprecedented in scale for discipline-specific corpus-derived material, and has been publicly released.

KEY FINDINGS

We present the main findings in brief in the sections below.

SIGNIFICANCE OF FINDINGS

Alongside the knowledge of the importance of academic vocabulary for educational success, is an increasing awareness of the need for students to be familiar with the differing discourse patterns of various academic disciplines. One major stream of research has been the development of corpus-derived vocabulary lists to assist in building proficiency in academic literacy. However, the focus of previous lists has been primarily on general

academic vocabulary, or else targeted at individual subject areas. Moreover, previous lists have been constructed for the tertiary level or for adult language learners.

In contrast, the current research has taken the novel approach of creating discipline-specific wordlists based on a corpus of secondary school textbooks for eight core subjects: Biology, Chemistry, Economics, English, Geology, History, Mathematics, and Physics. Additionally, the present research has gone beyond simple wordlists and also produced discipline-specific lists of collocations and word families aimed at providing teachers at the secondary level a unique set of resources that may be used to facilitate the teaching and learning of disciplinary literacy.

The research has produced innovative resources for developing disciplinary literacy, i.e. the Secondary Vocabulary Lists and the Secondary Phrase Lists, a set of discipline-specific lists containing content words, lexico-grammar and phraseology across multiple subjects. Furthermore, the research contributes to theory as well as practice. The extent of a general academic vocabulary has been questioned by previous research and the current research found extensive disciplinary variation in the kinds of vocabulary needed for successful reading in secondary school, thereby supporting the need for discipline-specific resources that capture them.

PARTICIPANTS

The study had no participants.

RESEARCH DESIGN

We built a 16.5 million word corpus of current secondary school textbooks with approximately 1.5 million to 2 million words per discipline, and we cover with a consistent methodology consisting of eight disciplines: biology, chemistry, economics, English, geography, history, mathematics and physics.

Discipline-specific vocabulary was extracted according to state-of-the-art metrics and statistical measures: minimum frequency of 28.57 p/m (Coxhead, 2000); range of more than 50% of texts; Oakes' Dispersion of 0.5; range ratio of 20% of an item's expected frequency in 50% of texts; and new metrics such as a discipline-specific frequency Ratio and Keyness (i.e. a lemma needed to be a keyword in the discipline at a ratio 3 times higher than the rest of the corpus). We also POS-tagged and required the lemma to be a major part of speech (noun, verb, adjective, adverb). Going beyond previous studies, we simultaneously developed collocational and word family lists for each target lemma.

The final lists distilled from the corpus the core lexical items that need to be mastered by students to read successfully in a content area (reaching lexical coverage within disciplines of > 20%).

REFERENCES

Coxhead, A. (2000). A new academic word list. *TESOL Quarterly, 34*(2), 213-238.

Hyland, K. (2017). English in the disciplines: Arguments for specificity. *ESP Today-Journal of English for Specific Purposes at Tertiary Level, 5*(1), 5-23.

Shanahan, T., & Shanahan, C. (2008). Teaching disciplinary literacy to adolescents: Rethinking content-area literacy. *Harvard educational review, 78*(1), 40-59.

About the authors

Clarence GREEN is with the National Institute of Education, Singapore .

James LAMBERT is an independent researcher in Australia.

Contact Clarence Green at Clarence.green@nie.edu.sg for more information about the project.

This brief was based on the project DEV 01/16 CGG: Improving Disciplinary Literacy by Developing Vocabulary and Grammatical Profiles.

Request for more details

Please approach the Office of Education Research, National Institute of Education, Singapore to obtain a copy of the final report.

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