Investigating the Invisibility of Writing Practices in the Engineering Curriculum

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Certificate of Authorship/Originality

I, Rosalie Goldsmith, certify that the work in this thesis has not been previously submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature of Student:

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Date: 28 May 2018

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Dedication

To my parents, Audrey and Lindsay Goldsmith, who taught me to value education, and who would have been so proud.

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List of Abbreviations

ABET	Accreditation Board for Engineering and Technology, Inc.
ADTL	Associate Dean Teaching and Learning
ALL	Academic language and learning
AT	Activity Theory
DEC	Design of Electronic Circuits
DEEWR	Department of Education, Employment and Workplace Relations (Australia)
EA	Engineers Australia
EAL	English as an additional language
ESL	English as a second language
PAT	Practice architectures theory

List of Terms

ALL lecturer	Academic/professional staff who develop students' disciplinary literacies
Associate Dean Teaching and Learning	provides strategic leadership in teaching and learning in a faculty
Engineering educator	Academic staff teaching engineering in a university
Engineering program	Course of study which leads to an engineering degree
Engineering subject	Unit of study as part of an engineering degree program
Graduate Certificate in Higher Education	course of study to introduce principles of learning and teaching for university educators
Subject coordinator	Responsible for the design and delivery of a unit of study

Abstract

Engineers are expected to have high level communication skills in order to carry out their work, which includes interacting with diverse stakeholders, colleagues, employees and clients. Of particular importance is the ability to negotiate, evaluate, persuade and make recommendations, both in speaking and in writing.

However, it is difficult to see where writing practices are developed in engineering degree programs. Specifically, the gap between writing practices in the engineering curriculum and those of engineering practice has been acknowledged for decades by employers and by organisations such as Engineers Australia, but the continuing emphasis on engineering science in the Australian engineering curriculum provides little room for the development of writing practices which negotiate meaning and which provide opportunities to develop critical analysis and evaluation. Writing practices can be said to be invisible.

This study investigates the contributing factors to the invisibility of writing practices in the engineering curriculum, looking at how writing practices are made invisible. A practice theory perspective was used to inform the research questions and to analyse the data collected from the case studies of nine engineering educators from five different Australian institutions and a range of engineering disciplines.

The study found that there was a range of practices across the case studies, but that the majority of practices in the participants' sites of practice constrained rather than enabled the development of writing practices in the context of learning engineering knowledge. Some of the practice architectures which held the constraining practices in place were at the local level, while others appeared to be part of institutional practices. However, some case studies had practice architectures which held in place practices to enable the development of students' writing, within a subject, across sequential subjects or throughout an engineering discipline. These case studies provided evidence of the arrangements which prefigure supported writing practices in the engineering curriculum. The significance of this research is to provide empirical evidence of the constraints around writing practices in the engineering curriculum which have been acknowledged anecdotally for some time. Further, the study shows

how writing practices can be supported, given the appropriate practice architectures, and provides a language with which to talk about these arrangements.