UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Fanning the Flame: Investigating Guided Inquiry-Based Learning in the Secondary Science Classroom

by Christopher Sandoval

Thesis submitted in fulfilment of the requirements for the degree of

Master of Education (Research)

under the supervision of Associate Professor Dr Matthew Kearney and Dr Tracey-Ann Palmer

University of Technology Sydney
Faculty of Arts and Social Sciences

March 2021

CERTIFICATE OF ORIGINAL AUTHORSHIP

I, Christopher Sandoval declare that this thesis, is submitted in fulfilment of the requirements for the award of Master of Education, Research, in the Faculty of Arts and Social Sciences at the University of Technology Sydney. This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis. This document has not been submitted for qualifications at any other academic institution. This research is supported by the Australian Government Research Training Program.

Signature: Production Note:
Signature removed prior to publication.

Date: 20/03/2021

Acknowledgment

Thank you to my supervisor Associate Professor Dr Matthew Kearney for his clear guidance and thoughtfulness, this thesis would not have been completed without his support. To Professor Peter Aubusson for starting this journey with me, his deep insights and wise words. My thanks to Associate Professor Wan Ng for working with me on the transition from ideas to actions. Thank you to Dr Tracey-Ann Palmer for helping this thesis get through its final stages. A big thank you to Associate Professor Dr Nick Hopwood for his perpetual grace and infectious positivity. As well as a thank you to the word wizard George Harb for helping my thoughts become more coherent.

Contents

List of Figures

List of Tables

Abstract

There is growing concern regarding school students developing increasingly negative attitudes to science during their secondary school experiences and disengaging with senior secondary and tertiary science subjects. The implementation of guided inquiry-based learning (IBL) to deliver science curriculum is believed to be an effective method to increase attitude, engagement and participation in science. In this study, guided IBL is defined as a level of science inquiry in which students investigate scientific questions given to them by teachers, using a procedure of their own design to collect data that they analyse to create their own answers. This study investigated the frequency of use of guided IBL in science classrooms and teacher perceptions about factors that affect the implementation of guided IBL pedagogy in the delivery of the NSW science curriculum. Thirty nine participants volunteered to complete an online survey. The survey consisted of both open and closed questions and data was analysed using descriptive analysis. Findings indicate that guided IBL may currently be used more often than expected with more than half of the participants reporting that they utilise guided IBL at least once per topic per class. Participants indicate that many factors enable guided IBL including teacher professional development, teachers' positive personal beliefs toward guided IBL and available laboratory resources and equipment. And surprisingly, despite the language of inquiry permeating the new NSW science syllabuses for the Australian curriculum, these new syllabuses as well as preparation for external exams are perceived as barriers to guided IBL implementation.