Influences on the science teaching self efficacy beliefs of Australian primary school teachers

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Declaration

This thesis is an original work. None of the work has been previously submitted for the purpose of obtaining a degree or diploma in any university or other tertiary education institution. To the best of my knowledge, this thesis does not contain material previously published by another person, except where due reference is made in the text.

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Abstract

The science teaching self-efficacy beliefs of primary school teachers are influential on teaching practice. The purpose of this research was to determine if informal education institutions, such as science centres, could provide professional development that influenced the self-efficacy of pre-service and in-service primary school teachers, and to what extent this was influenced by their science background, years of teaching experience and external, environmental factors. Participants were also asked if places such as science centres had a role to play with, and for, teachers.

A cohort of eight final year pre-service teachers and 13 in-service teachers (six from one New South Wales (NSW) school and seven from one Australian Capital Territory (ACT) school) completed a series of four one-hour workshops and were surveyed immediately before, immediately after, four months after and 11 months after the workshops. Surveys and semi-structured interviews were used in the data collection.

The results of this research showed that four hours of science centre produced, professional development workshops were capable of increasing the science teaching self-efficacy of all but three participants, with observable results for at least 11 months after the completion of the workshops. The ACT in-service cohort showed the greatest overall gains in self-efficacy. The pre-service cohort showed greatest gains in confidence in, and enjoyment of, science teaching. The school environment of the in-service participant cohorts was a major determining factor of how their increased self-efficacy influenced their teaching practice, with positive and negative consequences.

This thesis clearly demonstrated that the science education experienced by teachers in this study was highly influential in their own development of perceptions and beliefs about science that they, in turn, take to the classroom. This was just as applicable to newly graduated teachers as it was to those who have been teaching for over 20 years. Participants identified a role for science centres as a source of inspiration, support and training for teachers in order to help them teach science more effectively.

This project showed that the informal education sector could enact positive reforms within science education, but only if the context in which teachers must operate is taken into account and reform efforts adapted accordingly. The informal science education sector could be the key to achieving long lasting reform in science education where other, formal measures have failed.

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