

**EXPLORATION OF CRITICAL THINKING IN  
ENVIRONMENTAL SUBJECTS.**

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## **CERTIFICATE OF AUTHORSHIP/ORIGINALITY**

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree except as fully acknowledged within this 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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## ABSTRACT

This qualitative research study investigated the expression of critical thinking in environmental subjects at university level in Australia. It also explored the strategies used by lecturers to encourage student critical thinking. Initially an open-ended questionnaire was sent to lecturers and tutors in universities across Australia and the responses from thirty participants were analysed thematically. From these participants semi-structured interviews were arranged with six lecturers and eight students from three different universities. The third phase of the research process involved analysing subject outlines and student assignments. Findings were triangulated to create a picture of the teaching and learning practices of critical thinking in this field.

The three cases of Environmental Science, Environmental Engineering and Environmental Law were identified as having some common yet distinctively different themes in relation to critical thinking. In each discipline area three broad approaches to the expression of critical thinking were identified: scientific/technical, paradigmatic and reflective. The scientific/technical approach in science was most concerned with critique of experiments and studies, in engineering with problem solving and in law with the technical aspects of language and application of the law. The paradigmatic approach included critical analysis of the different theories, frameworks and paradigms of each subject. The reflective approach to critical thinking included students' self evaluation of their learning within a specific subject.

Notable differences between the three cases were the types of strategies used by lecturers to encourage student critical thinking. The Environmental Science lecturers were more inclined to use a wide variety of strategies, including provision of written material about critical thinking with critical thinking identified in marking criteria, discussion in class and guided exercises. The Environmental Engineering lecturers placed more emphasis on discussion in class than on providing written materials. The Environmental Law lecturers predominantly focused on the strategy of debating in class for the development of student critical thinking.

The findings of this study are significant in providing support for the argument that development of critical thinking is subject specific rather than generic. This calls into question the use of generic skills testing for university graduates as a reliable measure of their ability to think critically in their field. The findings indicate that it is necessary for subject lecturers to be explicit with students about their expectations regarding critical thinking, particularly in relation to assessment. Findings suggest guidelines for lecturers including strategies and attitudes that encourage or hinder student critical thinking. Findings also suggest that the nature of the field of environmental and sustainability subjects lends itself to developing critical thinking, which is considered to be important.