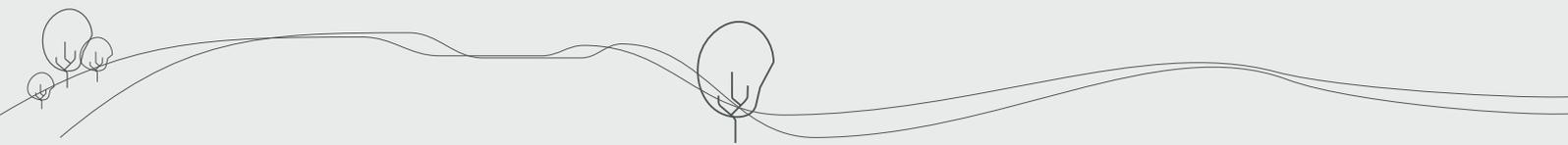


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# Investigating teachers' pedagogical approaches in environmental education that promote students' action competence

In 1999 the Ministry of Education published the *Guidelines for Environmental Education in New Zealand Schools* (Ministry of Education, 1999). The *Guidelines* are intended to assist teachers and schools to plan and provide education "in, about, and for the environment" in a way that integrates with learning objectives from the seven mandatory learning areas of the *New Zealand Curriculum Framework* (Ministry of Education, 1993). In 2002–2003 a national research project (commissioned by the Ministry of Education) was conducted to investigate the practice of environmental education (EE) in New Zealand schools (Bolstad, Cowie, & Eames, 2004). This project provided evidence that in teaching EE, some teachers were developing student-centred pedagogical approaches. The study also reported a general underemphasis on the dimension of education for the environment. The project report concluded that further research was needed to "evaluate whether EE teaching practices promote long-term learning value for students (i.e., whether it acts to develop students' 'action competence' and ability to be decision-makers with regard to environmental issues in the present and the future)" (p. 72).

An action orientation is seen as a key feature that defines EE (Fien & Greenall Gough, 1996; McLean, 2003; Tilbury, 1995). The concept of action competence acknowledges this orientation (Breiting & Mogensen, 1999; Jensen & Schnack, 1997). Action competence refers to students' abilities to act with reference to environmental concerns, as active participants in EE. It includes the ability to identify problems, make decisions about solutions, and take action that develops the students' competence to participate in future action on environmental issues. Development of students' action competence can be seen as promoting democratic and participative education that can be valuable across all aspects of schooling. This project focused on classroom practices that encouraged the development of student action competence within a unit based in EE.





## Research questions

The following research question guided this project:

*What pedagogical approaches are successful in promoting student action competence in environmental education?*

This research imperative led to an examination of the development of students' action competence before and after the EE unit, and whether the teaching and learning approaches that teachers used in the unit enhanced that development.

## Research design

This study comprised five case studies of New Zealand classrooms, in an action research model (Wals & Alblas, 1997). The study involved mentors, researchers (co-ordinators) and practitioners (teachers) working together in the design, implementation and evaluation of an EE unit. Mentors (who were experienced EE researchers) provided the direction for the project, gave support and advice in methodology and evaluation, and supervised reporting. The primary research data collectors were Regional Environmental Education Co-ordinators, who were school advisors based at universities or colleges of education. These co-ordinators normally work with their schools to provide advice and support in the delivery of EE. Much of their practice is not informed by their own research—this study represented an excellent opportunity to develop a research culture in their practice. Each co-ordinator identified a teacher in one school who was willing to act as a partner in this research. The EE unit was chosen either by the teacher or by the school. The teachers planned and delivered an EE unit to their classes. The researchers and teachers collected and analysed research data on student action competence in the unit. Data were collected through interviews, observations, surveys, and document analysis. The researcher–teacher partnerships collaborated in writing the case study report. The study was informed by a literature review carried out by the mentors.

## Research framework

At the project meeting in March 2005, the research team debated the components of action competence. We delved deeply into what these components would look like in the classroom. In considering action for the environment, we agreed that students need to be involved in deciding what to do, and that it should focus on solving an actual problem. In linking together these ideas of competence in taking action, we identified five components that underpin action competence:

- Knowledge and understanding for decision making—students require knowledge on which to base soundly reasoned decisions. Knowledge could include technical, social, political, historical, and economic factors.

- Planning and taking action—students require skills and confidence to identify and solve problems, to set goals, to gather information, to communicate, and to manage time and logistics to take action (both indirect or direct).
- Participation—students require skills in making decisions and being consultative, democratic, collaborative, and co-operative.
- Emotional response—students need to understand their own and others' attitudes and values towards issues to enable them to decide upon the appropriate action to take, and their own personal responsibility and commitment.
- Critical thinking and reflection—students require skills to think critically about the causes of issues and actions that could be taken, and to reflect upon their knowledge, actions, participation and attitudes and values to make meaning.

The challenge for us in this research study was to be able to determine the students' development of these elements through teaching and learning in EE. The elements of action competence that we identified led us to consider that a transformative mode of teaching and learning was likely to be more in keeping with developing action competence than the transmissive mode. A number of authors have previously argued for the consideration of transformative learning in EE (Sterling, 2001). We explored the possible pedagogies that could lead to a transformative mode. The following pedagogies and strategies were seen to be useful:

- experiential learning
- inquiry learning
- co-operative learning
- reflective practice
- student-centred learning
- affective-aware teaching.

With agreement on this framework within the research team, the task for the teacher–co-ordinator partnerships was to decide how to use it to plan and deliver the environmental education unit, and research how the unit may help students develop action competence. The partnerships were given autonomy to choose which pedagogies and teaching strategies they felt most appropriate for developing action competence in their unit.

## Findings

The following themes emerged from a cross-case analysis:

- Careful choice of pedagogy that allowed for development of action competence was important.
- The adoption of a transformative approach to teaching and learning led to a more student-participative, teacher-facilitative environment.



- There was evidence of significant student engagement, participation and collaboration in the EE units. Boys appear to improve achievement through EE.
- Student action-taking requires careful teacher facilitation to ensure it is manageable and achievable.
- EE is enhanced by whole-school approaches, and long-term plans that allow for student engagement and action taking.
- EE is influenced by culture and the learning environment.
- The development of action competence may be age related.

## Implications

The study raised a number of key implications:

- Teachers need to think pedagogically and be able to consider the most appropriate pedagogies that would underpin their teaching of particular units.
- Specific professional development may be required to help teachers gain pedagogical knowledge for student action taking.
- Teachers need to be aware of their role in relation to their students as they move between the functions of teacher and facilitator of learning.
- Teachers need to understand that effective EE requires time for students to have experiences to reflect upon, work collaboratively, and plan and take action.
- Teachers may be most successful in delivering EE through integrated units.
- Teachers need to consider what aspects of action competence can be developed in the age group of the children they are teaching. In particular, they need to consider the degree of teacher direction required to assist the children to take action.

## Recommendations for future research

On the basis of this study we recommend research into:

- the development of an assessment tool for action competence and how teachers use this assessment tool in their classroom;
- whether there is a correlation between student age and their ability to take action for the environment, and therefore by definition to participate in environmental education;
- how school-wide approaches to EE such as the Youth Enviroschool programme meet the key competencies being advocated in the revision of the curriculum framework;
- age-related student progression in EE, to help teachers understand what can be achieved at each level of

schooling. This requires more researched examples of EE at each schooling level, preschool to Year 13; and

- the durability of change through EE. As Rickinson (2001) noted, there have been few studies completed into the long-term impacts of learning in EE.

## Building capability

This study provided an opportunity for the EE coordinators to design and implement their own research under the guidance of research mentors. The co-ordinators felt they learnt a lot about the constraints of carrying out research, the need for careful planning on data gathering and writing up findings, the difficulty of finding enough time to collect data and think critically about findings, and the success of research partnerships that work well. The teachers found that being involved in the research was challenging and sometimes frustrating, but ultimately rewarding and inspiring. They noted that it had caused them to think more deeply about their own practice and reflect upon why they do what they do (Rickinson & Robinson, 1999). They felt empowered at being able to generate knowledge for their own profession, and that they had learnt a lot about the process of research.

## Final comment

This study has provided some evidence for the value of a transformative approach to education. When students have been allowed to have a strongly participative role in their own education, under the expert facilitation of a pedagogically strong teacher, their achievements in developing competence in EE have been significant. While this approach to teaching and learning was undoubtedly challenging for the participants in the project, the dividends were clear. Consideration should be given by policy makers, professional developers, and teacher educators to make a commitment to fostering this transformative approach to educating our students in all areas of their schooling.

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