

RESEARCH THESIS ABSTRACTS

How Education Can Be Used to Improve Sustainability Knowledge and Thinking Among Teenagers

Randolph James Brazier, Supervisors

University of Cambridge, Cambridge, UK

Supervisors

Heather Cruickshank, University of Cambridge

Nicola Buckley, University of Cambridge

Abstract

Significant progress has been made with respect to Education for Sustainable Development (ESD) in tertiary education institutions, particularly universities. There are also examples of ways in which sustainability has been incorporated into secondary schools and curricula, but with varying levels of success. ESD that has been incorporated in secondary schools has been shown to engage students and give more context to the curriculum, as well as enable students to develop the critical thinking required to tackle the big issues that face the planet now and into the future.

In the United Kingdom, while some aspects of sustainability have been introduced into the secondary school curriculum, they are often merged into other subjects and do not attract as much attention as traditional subjects. Furthermore, sustainability emphasis varies between schools, exam boards and teachers, leading to differing levels of understanding among teenagers. As a result, it could be argued that some young people fail to engage with global issues, which could be contributing towards the lower rates of young people voting in the United Kingdom. Promoting sustainable development, and how engineering can contribute towards it, could also potentially help reverse the decline in engineering student entries at universities, by attracting more interest to the engineering field. Thus, the question is raised as to how sustainability knowledge can be improved among teenagers.

The research investigated the scale and quality of ESD at secondary schools in the United Kingdom and recommended a range of solutions to improve sustainability teaching and thinking among teenagers. A range of research tools were used, including a literature and curriculum review, interviews and surveys with teachers and students, and a role-play case study.

The research involved a survey being conducted with 475 UK secondary school students aged 12–18 years. The survey was conducted to determine the current level of sustainability understanding of the students, where they learned about it, their preferences relating to issues facing the Earth, and how they think sustainability teaching could be improved. Surveys were purposely open ended, and teachers were instructed not to give prompts prior to the survey, to enable an accurate reflection of

students' knowledge. Results of the surveys varied across age group, school, overall attainment levels of students and exam boards. In general, results showed that while students are interested and knowledgeable about current issues, their level of understanding of sustainability is poor to moderate, and they want it to be taught in more subjects.

A gap analysis was then conducted with a curriculum review, survey results and interviews with teachers as inputs. The aim of the analysis was to determine the difference between a desirable level of knowledge and teaching of sustainability, and current practice. Among other things, the analysis indicated that interactive learning would be beneficial, and thus a role play, set in Cambridge and covering environmental, social and economic aspects, was designed and run at two schools in Cambridge. An element of competition was included, as well as a relatively open set of rules, to invoke creative solutions. Observation during the game indicated engaged students. Feedback from students indicated that the game was a fun and useful learning tool. Feedback from teachers was also positive, indicating that interactive teaching tools, like role plays, class debates and field experiments, can be very valuable towards teaching students about the complexities of sustainability.

After the role plays, the students were surveyed with identical questions to the initial survey. Results were compared, and sustainability knowledge and the ability to identify environmental issues was seen to increase significantly, far more so than originally expected. This increase in knowledge was highlighted by the students themselves in subsequent feedback sessions.

Finally, steps were proposed to improve sustainability education that could be implemented by schools and teachers or at the UK National Curriculum level:

- a 'Sustainability Week' or sustainability short course to be run at early secondary school, with the aim to give students a holistic overview of sustainability;
- aspects of sustainability, including real-world examples, to be included in all subjects and lead on from the short course;
- interactive learning tools to be strongly encouraged and made available to all teachers;
- training and support to be provided to teachers to improve understanding and ability to teach sustainability;
- extra-curricular sustainability activities to be offered at all schools.

These steps, along with continual lines of communication and feedback between politicians, the public, industry, students and educators, will ensure that students understand sustainability and develop critical ways of thinking, leading to a more engaged generation.

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Author Biography

Randolph was a Commonwealth Trusts Scholarship holder and has recently completed an M.Phil in Engineering for Sustainable Development from the University of Cambridge, focusing his study on Education and Sustainability. Originally a graduate of the University of Adelaide with a double degree in Engineering and Science, Randolph is a current STEM Ambassador in the United Kingdom, working with schools and teachers to promote STEM subjects. Email: randolph.brazier@gmail.com.