Developing Scientific and Technological Literacy Through Community Projects

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Abstract

Science and technology education have the potential to ameliorate some of the basic problems in society, but realizing that potential is difficult. Many students leave school without developing the skills and abilities of scientific and technological literacy that would enable them to become savvy citizens in a rapidly changing world. A key reason for this is that the science and technology curricula offered to students lack the opportunities needed for students to apply what they learn in school in their world outside of school. When students see little personal or cultural value in the academic curriculum they are offered, they are "turned off" school science and technology.

In this paper, I argue that one solution to this problem is to bring the school curricula much closer to scientific and technological issues that impinge on students' lives, that is, to blur the boundaries between the science and technology that happens in school with the science and technology that happens in the community outside. I describe two school-community projects carried out in Western Australia, one dealing with the disposal of intractable waste and the other dealing with venomous snakes in an urban wetland habitat. In each of these projects there were opportunities for students to develop skills and understandings related to knowledge, capability and ways of thinking and acting in both science and technology. Students learned about the relevance of science in their world, and also about technological artefacts, processes and systems. In each project students gained a better understanding of the role of science and technology in the community and they were able to work scientifically and technologically (key elements of the local science and technological curricula) in ways that they could see made a difference. Through their efforts, they were assisting to educate people they knew in their community. Also, in each project, there were different opinions, arguments "for and against", with which students were able to interact, consider both sides and make reasoned judgements. Importantly, these projects resulted in an inclusive curriculum, breaking down stereotypes based on gender and other social variables, and encouraged all students to be equally involved.

The outcomes of these school-community projects indicate that success is dependent on three factors. First, the community experience must be integrated with the science and technology curriculum at school, otherwise it will not seem relevant to students, nor will it blur the boundary between the world of science at school and the world of family and friends in the community outside. Second, careful planning is necessary before the project begins. Such projects consume much time and energy, and it is critical to ensure that both the teachers and the students are prepared for what is going to happen, what outcomes are expected, and what they need to do to achieve them. Finally, teachers and students must be jointly responsible for task completion. Engaging students in the planning and assigning them responsibility for organising some of the activities, gives them a sense of ownership that promotes their sense of accountability for the outcomes.