Engaging Young People in Science Education through Socioscientific Issues of Biosecurity

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Abstract

This study is relevant to the theme “Education Beyond the Human: Towards Sympoiesis” because it recommends that young people can be engaged in science education through socioscientific issues of biosecurity. Socioscientific issues are polemic social issues with conceptual and technical links to science but with many potential solutions (Sadler et al., 2004). Biosecurity is a socioscientific issue because many biosecurity practices are deemed controversial. For example, the use of 1080 poison to kill pests en masse has resulted in an outcry from animal cruelty groups who see using poison as a macabre and inhumane way of eradicating pests. The authorities, on the other hand see the use of 1080 as the only way to eradicate pests in New Zealand.

This study uses the ecological restoration theory. Ecological restoration is “an intentional activity that initiates or accelerates the recovery of an ecosystem” (Society for Ecological Restoration, 2002) and is an attempt to return an ecological system to some form of its original state (O’Brien, 2006). Ecological restoration has been widely used to right the wrongs of 200 years of colonialism in New Zealand.

Another theory that is applicable to this study is the transformative learning. Transformative pedagogy is different from traditional learning pedagogies in that, transformative pedagogy “is the process of effecting change in a frame of reference” (Mezirow, 1997), a move away from accepting knowledge to challenging knowledge. Transformative learning engenders an ontological change (Mezirow, 1990) through “critical reflection on the assumptions upon which our interpretations, beliefs, and habits of mind or points of view are based” (Mezirow, 1997). Use of transformative pedagogies may prompt young people to question biosecurity norms and effect change.

The source of information for this paper was literature and news around the New Zealand publics’ perceptions and knowledge of animals deemed invasive, alien and/or unwanted. This informed the choice to purposefully collect data from thirteen year old secondary school students to gauge their knowledge and perceptions of animals deemed invasive or unwanted in New Zealand. Consequently, it was realised that young people could be engaged in science and biosecurity education through socioscientific issues of biosecurity. Engaging young people through socioscientific issues of biosecurity provides an opportunity to present science education relative to the problems faced by planet earth.

‘Thick descriptive’ data in the form of interviews were sought (Neuman, 2003) and thematic analysis (Braun & Clark, 2006) used to analyse data.

The research was exploratory so an interpretive mode of inquiry was adopted because it allowed the researcher to interpret meaning by finding relationships within data and linking them to students’ understanding. A qualitative methodology was employed because the aim of the research was to find out students’ knowledge of biosecurity. Hence a humanistic interpretive approach also called “thick descriptive” was taken so detailed descriptive data could be generated (Neuman, 2003). The researcher needed the participants to generate responses to questions about their knowledge of and understandings of biosecurity. This was achieved by using a questionnaire with open ended questions to collect qualitative data. Further, nine students were interviewed using the same question that appeared in the questionnaire using the semi-structured style of interviews.
The interpretive method allowed data to be both interpreted in a detailed way (thematic analysis) and give the reader a feel of how another person constructs their social reality. In this way students’ knowledge of biosecurity could be revealed through the analysis of both the questionnaire and interview data and patterns and themes developed.

Biosecurity is important to New Zealand and so are finding ways to educate young people (Ram et al. 2016). However, there is the issue of young people’s disengagement with a science-related curriculum to address. Internationally there have been concerns about the lack of interest in science and scientific learning in schools according to the Programme for International Student Assessment (PISA). Schooling practices are said to have not only disenfranchised young people but also contributed to their disengagement from subjects such as science. For example, Fredricks et al. (2019) identified boring and irrelevant curricula as key factors that contributed to the disengagement of urban youth in urban schools.

Learning through interest or in other words making the school science curriculum relevant and mirror real-world issues have been previously argued. Dewey (1916/1997) postulated that young people were divorced from the concept of education because it lacked relevance to their lives. He suggested exposing young people to meaningful, authentic and relevant problems to foster engagement. Hodson (2011) said that the current school science curriculum does not serve the interests, aspirations and needs of the modern citizen and called for the science curriculum to be more relevant to give young people an opportunity to tackle real-world issues that have a scientific or environmental component. One way to achieve relevance in the science curriculum could be through including issues that are important to humankind such as biosecurity or climate change which could create a base for young people to construct an understanding that is personally relevant, meaningful and important. Presenting science as a socio-scientific issue in the classroom can solve the relevancy problem in teaching and learning (Driver et al., 2000).

References