Ethical Dilemma Story Pedagogy – A Constructivist Approach to Values Learning and Ethical Understanding

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ABSTRACT: Ethical Dilemma Story Pedagogy (EDSP) is a constructivist approach to values education. Lily’s work on EDSP has focused on its use in science education where our research has demonstrated enhanced critical scientific literacy and critical self-awareness amongst students. EDSP is different from other approaches to values education such as socio-scientific argumentation and character education. In EDSP, a story containing ethical dilemmas evokes critical thinking and critical reflection. The focus is on the reflection process rather than on argumentation skills or moral reasoning. Used in the context of socially responsible science education, EDSP has been trialled in science classes at secondary level and at elementary level. As a pedagogical strategy, EDSP originates from values education and is suitable for teaching contentious issues that require students to draw on their values and content knowledge to engage in informed, evidence-based decision-making, critical thinking and critical reflection and collaborative problem solving.

1 INTRODUCTION

With the rapid advance of science and technology in an increasingly globalised and post-modern world, new ethical questions keep arising: should we allow geneticists to create life from scratch in a Petri dish? Should we nurture the economy at the risk of the natural environment? Should we allow the market to regulate everything? Should we plant genetically modified crops to feed our increasing population? Should we endorse genetic research to further the chance of preventing rather than curing numerous serious diseases? Many teachers around the world – and science teachers in particular - find themselves confronted by these questions, and they may feel under-equipped and under-prepared to engage in the teaching of socio-scientific issues where science and society meet. In the teaching of socio-scientific issues (SSI), “…SSI are equated with the consideration of ethical issues and construction of moral judgments about scientific topics via social interaction and discourse” (Zeidler, 2003, p. 8). The main focus here is on moral and scientific reasoning. At the same time, they may feel challenged by professional questions, such as; what pedagogical methodologies should I use when teaching about contentious socio-scientific issues? Should values be taught in my science classrooms at all or should they be left to the Religious Education Department? This last question has given rise to debate in science education in Australia.

2 VALUES AND SCIENCE EDUCATION

The Department of Education, Science and Training (DEST, 2005b) stated that the role of teachers in values education is ‘critical’ and “…all teachers are values educators”. This statement set the scene for science teachers finding themselves responsible for values education in school settings. Many science teachers have since expressed, “…concern that they were insufficiently equipped” to accommodate debate that may arise during ethical discussions initiated through values education (Levinson, Douglas, Evan, Kirton, Koulouris, Turner & Finegold, 2000, p. 113).
Additionally, many of these teachers expressed concern about their personal opinions emerging to displace the equilibrium between a “balanced viewpoint and acknowledging one’s own person belief system” (Levinson et al., 2000, p. 118). These concerns were supported by a case study in which a teacher faced the dilemma of whether to question a student’s racist remarks or leave the comments alone and risk her silence being “…interpreted as tacit approval” (Wallace, Louden, Dawson, Lock, Brickhouse, & Crosthwaite, 2002, pp. 176-179). However, this does not appear to be the only reason some science teachers refrain from explicitly teaching values in the classroom.

Australian science teachers cite curriculum overload as the main reason for not teaching values, stating that there is simply no room in an already crowded curriculum. The science curriculum, as with many other learning area curricula, is densely-packed and overcrowded. Since science specialists tend to look at the world through scientific glasses, some science teachers may find it difficult to justify teaching values and ethics in an already crowded curriculum (Fensham, 2004). Levinson et al. (2000, p. 118) learned from interviews of science teachers that even though there was widespread recognition of the importance of the social and ethical dimensions of science, the combination of an overcrowded curriculum and high status content left teachers unwilling to tackle the values implicit within science. To be fair, we cannot just blame the teachers for marginalising the ethical dimension of science. As Levinson et al. (2000, pp. 111-112) identified, students too tend to “draw a strong distinction between subject discourses and ‘talk’ that they see as not related to subjects.” In the science education context, this may also lead students to consider a discussion with a strong emphasis on social and ethical issues (i.e. socio-scientific issues) as “non-science and of low status.” In a case study of a Year 10 science teacher who implemented ethical dilemma teaching, the teacher noted that, “…most of the students relish the opportunity to engage in rich discussion about ethical issues although some have reacted angrily to the changes from their regular science classes” (Wallace et al., 2002, p. 176).

An issue playing on many people’s minds when thinking about teaching values in science classrooms is that science is perceived by many as an objective, content driven, values-neutral discipline (Levinson et al., 2000; Stevens, 2007). Traditionally, science education has been driven by a ‘positivist program’ with a strong emphasis on ‘technical rationality’ and an unquestioning acceptance of the knowledge to be learned (Driver, Asoko, Leach, Mortimer & Scott, 1994, p. 11). Many science teachers are heavily invested in this epistemological view of science which necessitates a clear distinction between values and facts. Even though many controversies surrounding science-based developments, such as In-Vitro-Fertilisation (IVF) or human cloning are saturated with moral and ethical dilemmas, the discussion of social and ethical issues in the science classroom is viewed by some as subverting fact-based teaching and diluting “the strong conceptual basis associated with school science” (Levinson et al., 2000, p. 118). In their research, Levinson et al. (2000) found that many science teachers view their primary role as correcting student misconceptions and saw it as the role of teachers of other subject areas to tackle general social issues. Fensham (2004), on the other hand, emphasised that science and values were inextricably linked, since most socio-scientific issues are scientifically highly complex, meaning that, scientists have to be selective about what aspects exactly they choose to research. They make this decision based on their own values. As such, science itself can be viewed as being infused with values and serving the purpose of certain groups. “Any field of human discourse in which the general value-terms ‘good’ and ‘ought’ figure, falls within the range of axiology, even that of scientific method with its principles about the degree of belief one ‘ought’ to give to a hypothesis in the light of a given body of evidence” (Bullock & Trombley, 1999, p. 60). Consequently, science itself as a way of knowing is value-laden. This perspective directly undermines the often quoted fact-value dichotomy. By contrast, Stevens (2007) rejected the value-laden perspective of science, arguing that a scientific fact is a distinct and different domain to values and, therefore, the two domains should not be conflated. However, he too acknowledged that political and moral dilemmas arise from the developments of science.

The suggestion that science is a collection of facts only has indeed been the topic of a longstanding debate. As Driver et al. (1994, p. 6) pointed out, science is a social construct that is socially negotiated by the scientific community as a series of constructs that have been, “…invented and imposed on phenomena in attempts to interpret and explain them.” Scientific constructs are then communicated to the public through cultural and social institutions such as schools, religion, and media (Driver et al., 1994, p. 6). This social-constructivist notion of science...
does not preclude the empirical basis of science but rather places an emphasis on the “...social construction and validation” of scientific knowledge which connotes a strong interdependent relationship with values (Driver et al., 1994, p. 6).

Ultimately, we can argue, scientific knowledge can be used for both beneficial and detrimental purposes. Whereas in the past “science was mainly concerned with explaining phenomena,” modern science is a “crucial part of man’s efforts to change the world” (Frazer & Kornhauser, 1986, p. v). As such, this raises questions of ethics, social responsibility and value judgements. “Scientific knowledge is not only used but it is also misused to serve the purposes of specific groups and, as such, scientific knowledge must always be ethically assessed. This assessment should not only consider scientific evidence, but also the values that underpin its application” (Paul, 1988, p. 15). It is this discrepancy between the moral dimensions of science in the real world and the lack of it in science classrooms that causes concern (Fensham, 2000, p. 75).

Hence, rather than avoiding addressing values in science altogether, there are at least two good reasons for including social and ethical aspects of science in the classroom, as Paul (1988, pp. 15-16) explained: addressing contentious, value-laden issues is of greater interest to most students and of greater practical use to them than the more traditional ‘pure-science’ emphasis. Furthermore, working through such issues helps students develop a more unified perspective on their values and personal beliefs and on the moral issues that science inevitably generates when applied to the real world.

In my (Lily’s) own work as a science teacher-educator, I emphasise the importance of values education with my pre-service teacher education students when I remind them that, as teachers of science, we contribute actively to preparing our students for life. We wish to enable them to participate in the environmental debate and in the discourse on science as informed members of society and future decision-makers. For this purpose, it is crucial that learners develop critical scientific literacy by developing an understanding of ethical issues in addition to content and inquiry skills. Given the tensions between those who are in favour of teaching about values in the science classroom and those who are against, we briefly provide an overview of how the debate about the teaching of ethical understanding has unfolded in the Australian context over the past two decades.

3 VALUES EDUCATION IN AUSTRALIA

‘Values’ - a word that is bandied around and used in regular everyday conversations. But what exactly are values? The *Australian Oxford Dictionary* defines values as, “the regard that something is held to deserve” or as “…the principles or standards of behavior” or as, “…one’s judgement of what is important in life” (Oxford University Press, 2018). Values have been an ongoing topic for debate in the Australian education arena and, depending on the political flavor of the day, governments wish to see more - or less - values education in Australian classrooms. The Australian Curriculum, that is, the national curriculum that is currently mandated as the basis for all education in Australian schools has been rolled out from 2010 and is overseen by the Australian Curriculum, Assessment and Reporting Authority (ACARA). It not only outlines the content and skills curriculum mandated for learning areas such as Mathematics, English and Science but it also highlights a set of Cross-Curriculum Priorities (Aboriginal and Torres Strait Islander Histories and Cultures, Asia and Australia’s Engagement with Asia and Sustainability) and - most relevant to values education – the General Capabilities (i.e. Literacy, Numeracy, ICT Capability, Personal and Social Capability, Critical and Creative Thinking, Intercultural Understanding and Ethical Understanding). Ethical Understanding is the most relevant capability for values education: Ethical Understanding involves developing an understanding of ethical concepts and becoming able to explain what constitutes an ethically better or worse outcome and how it might be accomplished (Australian Curriculum, Assessment and Reporting Authority, ACARA, n.d.). The General Capabilities are to be addressed by teachers of all the learning areas and all year levels. The General Capabilities encompass the knowledge, skills, behaviours and dispositions needed by young Australians to live and work successfully in the twenty-first century (ACARA, n.d.). Hence, it can be argued that the curriculum now clearly states that all Australian schools, all learning areas, and all teachers have been charged with the responsibility to teach ethical decision-making however, it has not been a straightforward process to introduce values

education into Australian schools. When a previous government mandated the explicit teaching of a set of core Australian values the question arose as to what we actually mean by ‘Australian Values’. The Government’s nine core values, which, at the time, were regarded as promoting “Australia’s democratic way of life” (DEST, 2005a, p. 5), included: Care and Compassion; Doing Your Best; Fair Go; Freedom; Honesty and Trustworthiness; Integrity; Respect; Responsibility; and Understanding; Tolerance and Inclusion (DEST, 2005a, p. 4). Whilst there is nothing inherently wrong with any of these values, Australians baulked at the idea that the Government would define values to be taught explicitly to all children. It was the Government’s definition of how values education should be conducted that proved to be problematic and led to debate and resistance. Teaching values explicitly is the hallmark of values education that is conducted in a behaviourist manner which is often the case in character education. To many in Australia at that time, the direct teaching of values chosen by the Government seemed akin to ‘indoctrination’ of minors, reminiscent of religious schools of the past. Many Australians resent this type of values education and do not want to see it in public, government-funded schooling. When the Australian Curriculum was developed, it seems that ACARA avoided this conflict by referring to (what is effectively) values education as teaching the General Capability of Ethical Understanding – something that can hardly be argued against.

Given the resistance to behaviourist approaches in the Australian education arena, the question arises as to what alternatives we can choose instead. It helps to look at the other side of the epistemological and axiological spectrum, where we can find approaches to values education that are constructivist in nature and that, rather than indoctrinating students and promoting a certain set of pre-approved values, encourage students to think for themselves and challenge their own taken-for-granted assumptions through critical thinking and critical reflection: enter EDSP.

4 ETHICAL DILEMMA STORY PEDAGOGY (EDSP)
In this type of transformative learning, the values learning process is initiated by confronting students with an ethical dilemma, that is, a situation in which a decision has to be made which can potentially lead to harmful outcomes, and where there is no simple right or wrong answer. In typical constructivist fashion, students are guided through the story and the embedded ethical dilemmas by the teacher who acts as facilitator of student thinking and interaction, rather than as an instructor of explicit values in the classical sense. Students learn to listen carefully to other students’ ideas and discuss with their peers potential solutions. According to Jack Mezirow (1991), it is in the moment when students are experiencing a disorienting ethical dilemma and are ‘forced’ to engage in critical reflection on their taken-for-granted assumptions in order to find a suitable solution that transformative learning occurs. Through the reflective process and interactions with peers, students are given opportunities to change their values if they feel it is appropriate or needed. They do this by constructing new values or adapting existing ones. The underlying constructivist assumption about how values learning occurs is based on Lawrence Kohlberg’s work (1984) which, drawing on Piaget’s constructivist thought, cautioned that values cannot be taught explicitly as is the assumption in behaviourist approaches to values education – rather it is the student herself/himself who actively constructs values.

The teacher’s role as facilitator requires that she/he not impose opinions or share her/his own values. This is a core difference to behaviourist approaches to values learning. Rather, the teacher as ‘storyteller’ tells a story that contains one or more ethical dilemma situations which is interrupted at appropriate times, that is, when an ethical dilemma arises in the story. At this point, students are asked to make a decision on behalf of the characters in the story, “Put yourself into the shoes of… - how would you decide if you were…? Give reasons for your decision. Please reflect by yourself first and then discuss with a partner.” Note that students are always asked to reflect by themselves first before engaging with others. This is to ensure that they draw on their own values rather than just copy what their friends are saying. Usually, student collaboration is scaffolded by starting with Think-Pair-Share early in the story, followed by groups of three, then groups of four students, before engaging the whole class in a plenary discussion. It is the role of the teacher to facilitate students’ collaborative decision-making, ensure student engagement by playing devil’s advocate, and manage the classroom in terms of individual and group work options. This constructivist pedagogical approach to values learning is referred to as ethical dilemma story pedagogy.

Ethical dilemma stories, also referred to as moral dilemma stories, can be used at any grade level and in a variety of forms. “They present a realistic situation in which some dilemma is thrust upon the actors in the story” (Benjamin, 1986, p. 160). ‘Provocation’ to start the story can be a range of stimuli such as “a poster/picture, a single slide, an oral or printed story without an ending, or even simple puppets acting out a story” (Benjamin, 1986, p. 160). The story should be such that there is not an obvious ‘right’ or ‘wrong’ response, but a narrative in which options must be weighed and a decision made. When students share their responses they also share the reason for their choice and this allows students to practice moral decisions-making (Benjamin, 1986, p. 160). Ethical dilemma stories are a genre inasmuch as they are stories containing ethical dilemmas, and there are a number of ways in which they can be implemented in the classroom. In my doctoral research on moral dilemma stories in science classrooms (Settelmaier, 2009), the participating teachers narrated the dilemma story to the students and the ethical dilemma story lesson was concluded with poster presentations and a plenary discussion.

Rather than using pre-fabricated dilemma stories that others had written, we trialled a different approach during the project ‘Socially Responsible Science’. As part of this project, a group of science teachers received intensive professional development in ethical dilemma story pedagogy. Furthermore, they were taught how to write their own ethical dilemma stories, since appropriateness of the story to the context and the students is vitally important for its success. Ideas for the dilemma story topics were provided by guest speakers who spoke about the ‘ethical dilemmas inherent in their professions’. This included a speaker from the Perth Zoo, an agricultural scientist, and a geneticist interested in genetically-modified foods (GMO). The teachers chose and researched an ethical dilemma which they consequently developed into an ethical dilemma story and trialled with their own students. The stories were mapped onto the curriculum and linked to the local context. Moreover, the teachers provided their own reflections on the implementation of the stories in their classrooms. The ethical dilemma stories resulting from this project were compiled on the website titled ‘Socially Responsible Science – a Living Resource’ (www://sociallyresponsiblescience.com.au) that is hosted by the Science Teacher Association of Western Australia (STAWA). The stories, curriculum links, and teacher reflections are available to teacher across the globe. We call the website a ‘living resource’ because we encourage teachers to write their own stories and share them with other teachers via the website. We provide support with editing and ensuring that the stories fit the guidelines for ethical dilemma stories. Since its inception, the website has grown and is now hosting stories from Australia, Austria, Japan and Pakistan. Details about how to write and share an ethical dilemma story with us are provided on the website.

5 EDSP – A CONSTRUCTIVIST VALUES EDUCATION STRATEGY
The demands on teaching professionals in Australia – and the rest of the world - have expanded beyond the concrete boundaries of traditional key learning area concepts. To address the breadth of the curriculum for the 21st Century, the Australian Curriculum Assessment and Reporting Authority (ACARA) introduced the Cross-Curriculum Priorities and the General Capabilities in the Australian Curriculum. For values education, this means that the role of the teacher has clearly moved past the public setting of academia and entered the “private domain of personal morality, belief and practical conduct” (Lovat, n.d., p. 2). All teachers in all learning areas are now responsible for teaching of the General Capability of Ethical Understanding. Some Australian science educators may still experience this situation as a challenging imposition due to the fact-values dichotomy still prevailing in many science classrooms. On the other side of the spectrum, we find those who argue that science is already value-laden, as demonstrated by the many ethical dilemmas that arise from scientific advancements. Since behaviouristic approaches to values education promoting direct teaching of specific values were not well received in Australia, a constructivist strategy such as Ethical Dilemma Story Pedagogy lends itself as a viable alternative. By implementing a cognitive approach to values education that uses ethical dilemma stories to initiate active values construction by learners, this strategy has the potential to help science teachers fulfil their responsibility of teaching values, content and science inquiry skills whilst at the same time enhancing students’ critical scientific literacy.

6 REFERENCES

Australian Curriculum, Assessment & Reporting Authority (ACARA) (n.d.). The General Capabilities. Downloaded 14 October 2018 from https://www.australiancurriculum.edu.au/f-1-0-curriculum/general-capabilities/ethical-understanding/learning-continuum/?isFirstPageLoad=false&element=Understanding+ethical+concepts+and+issues&element=Reasoning+in+decision+making+and+actions&element=Exploring+values%2c+rights+and+responsibilities&level=Level+1&level=Level+2&level=Level+3&level=Level+4&level=Level+5&level=Level+6&page=2


