

The development of epistemological pluralism through a web-based postgraduate curriculum course

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Techniques and procedures for acquiring, validating and evaluating knowledge claims are developed through procedural knowing. Separate and connected knowing are alternative forms of procedural knowing. Separate knowing is characterised by an objective, critical and adversarial stance whereas connected knowing is based on empathy and a willingness to suspend judgement. In the field of science and mathematics education the skills of separate knowers are valued and rewarded. That is, the ability to argue competitively, critique dispassionately, analyse according to rules and procedures and to exclude feelings and emotions.

This paper focuses on the web-based component of a post-graduate curriculum course in science and mathematics education where the course tutors explicitly valued and nurtured the connected knower skills of empathy, learning from personal experience and a sensitive collaborative approach. The course tutors adopted a connected teaching approach in the implementation of learning activities designed to encourage critical reflection about the learner's views of curriculum. The activities included maintaining a personal journal, participation in discussion room 'activities' and written assignments. In doing so, the tutors aimed to move their students toward an epistemological pluralism of constructed knowing, an integration of separate and connected ways of knowing.

Introduction

In Semester two, 1998, a Master's level curriculum course at the Science and Mathematics Centre, Curtin University was offered in the distance education mode with an optional web-based component. In contrast to a traditional information delivering approach where a fixed body of knowledge is transmitted to students, the course design was based on constructivist principles which encouraged learners to actively construct their own knowledge based on interaction with the material to be learned and their peers (Tobin, 1993).

It was hoped that the isolation experienced by some traditional distance learners would be ameliorated by the provision of a web-based component where students would have the opportunity to construct a virtual community where knowledge was socially constructed and negotiated through discourse. Through reading and writing (the web based analogues of listening and talking) course tutors and students could engage in a rich collaborative dialogue and together construct knowledge.

The web based component comprised a discussion room where, over a period of 15 weeks, students posted their responses to seven activities developed by the course tutors (David Geelan and Peter Taylor). Students had access to the two course tutors via email, telephone and mail. The activities were linked to articles in the distance education reader and were designed to encourage students to reflect critically on their personal beliefs and assumptions about curricula.

Of the 12 students initially enrolled in the web-based component, seven completed the course. (The other five withdrew because of personal and work related factors.) The students were all experienced teachers in the fields of science, computing or mathematics. Students were placed in study groups of three and were required to respond to at least the postings of their group members. At the end of each activity (~2 weeks), one of the course tutors prepared and posted a summary of the students' responses. Students introduced other topics for discussion which included

technical aspects, work related experience and comments on the type and quality of interaction in the discussion room. Participation in the discussion room comprised 25% of the overall assessment.

The remainder of this paper explains the rationale of separate and connected knowing and how an integration of both ways of knowing may enhance the depth and breadth of student learning in a web based medium.

Procedural knowing

Techniques and procedures for acquiring, validating and evaluating knowledge claims are developed through procedural knowing. Separate knowing and connected knowing are both types of procedural knowing. A separate epistemology is 'the opposite of subjectivism' (Belenky et al., p. 104). Separate knowers strive to be objective and in doing so 'suppress the self, taking as impersonal a stance as possible ... Separate knower's procedures for making meaning are strictly impersonal. Feelings and beliefs are rigorously excluded' (p. 109). Separate knowers look to authority for facts (i.e., text books, teachers, supervisors). As learners, separate knowers tend to favour a critical, adversarial stance. Their favoured mode of discourse is argument (Clinchy, 1989b).

In contrast, "Connected knowers begin with an interest in the facts of other people's lives, but they gradually shift the focus to other people's ways of thinking" (p. 115). Connected knowers attempt to see the world through the eyes of the other. Connected knowers come to understand other people's knowledge through empathy. They try to share the experience that led to that knowledge. In relation to empathy, it is important to realise that empathy is about reception, not projection. Thus, connected knowers do not project their own values and beliefs onto the other and reflect on how they would feel or behave. Rather, they are receptive to the other and they try to imagine why the other believes or behaves as they do. Connected knowing should not be confused with subjectivism or intuition. Connected knowers use reason, inference and empathy in their meaning-making.

Separate and connected knowing are not gender specific although Belenky et al. (1986) noted that 'it is possible that more women than men tip toward connected knowing and more men than women toward separate knowing' (p. 103). When interviewing men and women about separate and connected knowing, Clinchy (1989a) reported that many men felt uncomfortable with the use of connected knowing. However, there are men who favour connected ways of knowing (Clinchy, 1989b; Enns, 1993).

Individuals do not use one epistemology (separate or connected) to the exclusion of the other. Depending on the task or situation, individuals should be able to move from separate to connected knowers and visa versa. Yet, within a learning environment, a separate knower is more likely to value and use the techniques of logic, analysis and debate while a connected knower utilises empathy, collaboration and careful listening.

Connected knowing in higher education

The skills of separate knowers are valued and rewarded in higher education (Clinchy, 1989b; Henning-Stout, 1991). That is, the ability to argue competitively, critique dispassionately and objectively, analyse according to rules and procedures and to exclude feelings and emotions. These skills are important, but it is equally essential that tertiary educators also value and nurture the skills that connected knowers bring to the classroom. That is, the use of empathy, learning from personal experience and a sensitive, collaborative approach.

Connected knowing is no less rigorous than separate ways of knowing (Henning-Stout, 1991; 1994). Yet, there is a misconception that connected knowing is somehow inferior. When a connected knower refuses to argue, but rather suspends disbelief and attempts to understand the other, this does not mean she is incapable of argument or thinking. Yet, in traditional academia, such behaviour may be seen as alien.

Connected knowing in teaching and learning

Teachers who wish to enhance connected knowing in their classroom need to model connected behaviour. Lundeberg & Moch (1995) adopted a connected knowing approach to learning in the teaching of an optional course for female

nursing students who were identified as likely to fail their core units. Factors that enhanced connected knowing included a spirit of co-operation; a circle of community; a shift of power to the learner; encouraging risk taking behaviour; and modelling of uncertainty.

Stanton (1996) describes the work of several college teachers who model connected knowing in their classrooms. For example, Blythe Clinchy attempts to encourage connected knowing in her developmental psychology classes when she:

elicits students' commonsense views of psychology and child development so that they can be openly discussed and assessed. Room is made for personal narrative in the classroom. Not only do students write in journals (a fairly common device these days), but dialogue is encouraged through excerpting and distributing (with permission) passages from those journals, which then serve as fodder for further reflection. (p.43)

The metaphor of a midwife can be applied to connected ways of teaching (Clinchy, 1989b; Schroeder, 1996). As Schroeder states, "the new function of the teacher resembles that of a midwife, one who "assists in the emergence of consciousness" and who focuses not on his or her knowledge but on the knowledge of the students" (p. 5). The teacher as midwife cares for the student, affirming her and enabling her to give birth to her emergent voice, new ideas and thoughts, supporting and nurturing her as her ideas develop and grow. For example, rather than critique a student's work, the teacher needs to ask the student why they thought or wrote what they did. Rather than tell the student the correct answer (assuming there is one) the teacher needs to, through dialogue, nurture the embryonic idea that is emerging from the student's work.

Connected knowing and this project

We believed that modelling of connected behaviour by the course tutors, and student participation in connected learning activities would encourage them to become aware of, and adopt connected ways of knowing.

Participation in the discussion room activities was designed to encourage dialogue and articulation of voice and to encourage the students to value, and reflect on their personal experience. The activities were designed to enhance sensitive and reflective debate, and encourage empathic collaboration. It was hoped that students would utilise both the traditional separate knower skills of arguing and critiquing and the connected knower skills of listening to, and empathising with their peers.

By moving the students toward constructed knowing, an integration of separate and connected ways of knowing we aimed to enrich students' understanding of curriculum issues.

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