Creating a Professional Community of Reflective Inquiry: Tales of Reform via the World Wide Web

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Summary
In this paper we explain the ongoing development of our web-based teaching and illustrate how, over 3-4 years, key critical events precipitated the incremental transformation of our online teaching. Our narrative tells how we moved from inviting voluntary student participation in online collaboration to requiring and assessing participation. How we struggled with achieving the right balance between individual and collaborative student learning. How we developed increasingly powerful conceptual tools (metaphor, autobiography, framing, re-visioning) for engaging students in critical reflective inquiry. How we engaged students as managers of their online discourse community. We illustrate how our collaborative action research into the transformative possibilities of innovative web-based teaching has taken us forward as teachers and learners.

Introduction
In the middle of the second semester of 1998, Peter wrote a critical reflective note in his journal:

> I have a growing concern about the epistemology of our web teaching. The 'constructivist' metaphor of mind ('knowing as thinking'), which shapes our pedagogy, might be marginalising unduly our teaching role. This is evidenced by the predominantly 'episodic' teaching actions in the Discussion Room; actions which involve writing fortnightly summative perspectives on students' discursive activities. By modelling the absence of a dominating voice (or being silent) have we abandoned unwittingly the important teaching role of modelling the discursive practices that we value? Perhaps it might be fruitful to adopt an alternative metaphor ('knowing as co-participation') arising from a 'constructionist' epistemology in which mind is regarded as being distributed socially in dialogical (virtual) space?

This entry in Peter's reflective teaching journal signalled a turning point in the evolution of the epistemology of our on-line teaching which we had been developing over the preceding 3 years. But first a brief historical recap.

Learning as a Constructive Activity

Teachers of science and mathematics are being required to transform their teaching practices to reflect an understanding of learning as both a social and cognitive process. Curtin University is a leading provider of higher degree programs designed to assist teachers with this task. For teachers distant from the Perth campus, the World Wide Web is being used to deliver of study materials and interactive learning environments. Research has shown that on-line learning in higher education can be an advantage to students who are isolated or who need more flexible learning opportunities (Brown, 1998; Owston, 1997). However, on-line learning can also present teachers and students with challenges in establishing educative relationships via a new and somewhat restrictive medium of communication (Burge, 1994; Tolmie & Anderson, 1998).

In 1996 (for teaching in 1997), we developed a web-based learning environment for distance learners studying our Masters level 'Curriculum' unit. The students are primary, secondary and tertiary level teachers of science/maths/technology-related disciplines undertaking postgraduate professional development. The pedagogical values that underpinned our on-line design regard education as the most significant means of transforming our society into a more socially just, egalitarian, inclusive and peaceful culture. As teacher educators, these democratic and humanitarian social principles compel us to adopt a *critical constructivist pedagogy* which promotes critical reflective and communicative learning with an emancipatory intent (Taylor, 1998): (1) To engage teachers with their colleagues in a discourse of possibility for transforming their professional practices. (2) To stimulate teachers' critical awareness of restrictive cultural beliefs and assumptions which blind many to the possibility of re-visioning their practice. (3) To inspire teachers to develop their own critical pedagogy.

Our web site was designed to provide: (1) electronic access to existing distance education study materials, (2) a Discussion Room (or electronic bulletin board) for engaging in *text-based asynchronous communication* with fellow students and tutors (Peter and David), and (3) email for private correspondence. We provided a series of (not-for-assessment) on-line discussion activities supplementary to the (assessable) assignments (completed individually), and hoped that students would find irresistible the opportunity to enrich their learning in this innovative 'high tech' manner. However, by the end of semester, and despite our efforts to facilitate on-line dialogue, the results were disappointing (Taylor, Geelan, Fox, & Herrmann, 1997). Although the degree of on-line interaction amongst students varied widely, at the end of semester the log-file of the Discussion Room revealed a total of only 40 postings with ~3 messages per student.

The next year (1998), we decided to make on-line discussion an assessable learning activity, worth 25% of the overall grade. We assigned students to small groups and required each student, during every two-week discussion activity (a total of 7 activities), to post one on-line message and reply to at least 2 other students' messages. We endeavoured to promote *open discourse* in which students orientate towards others in an empathic and mutually supportive manner, disclose the richness and complexity of their (socially situated) experiential worlds, strive to understand each others' lived experiences, and develop a *connected* way of knowing (Dawson, 1998; Dawson & Taylor, 1998). We hoped that exposure to a range of diverse professional viewpoints would assist them to articulate, possibly for the first time, the assumptions that underpin conceptions of curriculum framing their own epistemologies of teaching practice.

The Discussion Room activities were designed also to engage students in *critical discourse*, that is, discourse aimed at generating critical self-reflective thinking about the

viability of the (often invisible) valued beliefs which shape their epistemologies of teaching practice (Taylor & Campbell-Williams, 1994). We hoped to facilitate a dialogue enabling each student to invite and make use of other students' viewpoints in order to reflect self-critically on his/her own preferred conception of curriculum.

Our assessment criteria for the quality of on-line dialogue were designed to ensure the co-construction of a virtual classroom community of learners who learned collaboratively, compassionately and critically about their own curriculum-related beliefs, values and practices. http://www.curtin.edu.au/learn/unit/smec612/standard.htm

As the semester progressed we witnessed a satisfying increase in open discourse amongst the students. Increasingly (but unevenly), students were sharing their viewpoints, understandings, experiences, and values relating to their professional practices (Taylor, Dawson, Geelan, Stapleton, Fox, Herrmann & Parker, 1999). A promising degree of critical discourse also was beginning to occur. But it was a form of critique that was directed outwards, at others, especially the authors of papers being read or (absent) colleagues/administrators/politicians who were deemed to be preventing these teachers from enacting their valued beliefs about teaching and learning. And to some degree, students also were being critical of each other. However, there was almost no evidence of students reflecting critically on *their own* perspectives.

At the end of that year, research on our on-line teaching confirmed another problem. Activity in the Discussion Room had turned from a trickle in the previous year into an avalanche this year; and we had been barely able to keep up with it. The number of postings had risen from a total of 40 (in '97) to almost 500 (Taylor, Geelan, Dawson & Stapleton, 1999). As on-line tutors, we had experienced difficulty in finding time to read all the postings; a task that we felt obliged to undertake so that we could provide (minimal) guidance on student learning. Summarising each group's discussion at the end of each two-week activity was a very time-consuming activity.

During those two years, we had been grappling with the pedagogical question "what constitutes an appropriate role for the on-line tutor in a 'student-centred' (virtual) classroom?". From our critical constructivist perspective, we were keen not to dominate group discussion, preferring students to develop autonomy by learning from the activities we had designed: preliminary reflective reading and writing by the individual followed by collaborative learning with peers. With our teachers' voices overly prominent, what chance would students have to find their own voices? On the other hand, they didn't seem capable of generating this type of discourse by themselves.

Learning as Co-Participation

At that time, we became aware of the theory of *constructionism* and its alternative metaphor of mind (Gergen, 1995; Steier, 1995). From this epistemological perspective, mind is distributed in *dialogical space*, giving rise to a pedagogical metaphor of *learning as co-participation* in discursive activities modelled by *experts*. Constructionist theorists argue that the constructivist metaphor of *mind as embodied* places too much emphasis on the individual thinker as the autonomous owner of the locus of control of knowledge construction. Maybe we had marginalised ourselves as tutors, having over-privileged student autonomy via the spatial metaphor of student-centred learning? We decided to increase our own participation in the Discussion Room in order to model appropriate self-questioning and self-critical commentary.

Other strategic changes we made to the structure of the unit are described in a recent paper (Geelan & Taylor, submitted). Briefly, these include: decreasing the workload by

reducing the number of Discussion Room activities from 7 to 5; better integration of individual preliminary reading/reflecting activities with discussion room activities; increasing the assessable value of on-line discussion to 60% of the final grade; replacing ongoing assignments with a final portfolio; assigning a 'group leader' to each activity and requiring them to post a reflective summary of their group's overall discussion; use of a new multi-room electronic bulletin board; and formative assessment of each students' participation in on-line discussion.

Our Latest Research

An important research question for our 1999 teaching of the revised on-line unit (to 12 students) asked 'to what extent did students engage in open and critical discourse in the Discussion Room?' To answer this question we generated *interpretive* data from a range of sources and paid particular attention to our *personal experiences* and *practical reasoning* as on-line teachers (Fenstermacher, 1994; Guba & Lincoln, 1989). Our approach was, first, to assess the congruence between each student's *perceived* and *preferred* on-line learning environment using the 'Constructivist On-line Learning Environment Survey' (Taylor & Maor, 2000), administered electronically at the end of the semester. Having identified 3 students with varying degrees of 'satisfaction' (a measure of the gap between students *preferred* levels of certain attributes of the unit and the extent to which they *perceived* them to be present), we then examined each student's (1) Discussion Room records, (2) on-line formative assessment, and (3) final portfolio. We looked specifically for evidence of the open and critical quality of their discourse as indicative of their productive engagement in a professional community of (self-)reflective inquiry. Having made inferences about the students' learning-related experiences, we checked their veracity through email dialogue with the students.

During 1999, David acted as the on-line tutor. He perceived a strong level of open discourse to be occurring: students felt supported by their colleagues and worked toward understanding others' perspectives. Critical discourse developed slowly during the semester, which was not unexpected, and much of the evidence for this mode occurred in the students' concluding portfolios. Several students reflected on their formerly unexamined assumptions, and committed themselves to changing their classroom practices, based on reflective critique of their former beliefs and practices.

On the basis of the survey results, we chose to analyse the on-line learning of three students. James, a primary school teacher with a particular interest in health sciences, is a very experienced teacher. James was chosen as the focus of a case study because he indicated the highest degree of satisfaction with his on-line learning experiences. Sarah, the second student studied in detail, teaches science with middle school students at the International School in a South-east Asian capital city. Matthew is the Head of Mathematics at a school on Queensland's Sunshine Coast, and was very supportive of the discussion and of other students in the Discussion Room.

James' only frustration was that the "sheer volume of material" made it difficult to respond to everything:

> *"I did find, when rereading the online discussion, there was so much that one could reply to, but there just wasn't time."*

Sarah shared this feeling (as did most of the class), and clarified its source:

> *"With the online format, you really have to come to an understanding more rapidly because others are depending on your input […] At times your response is the instant response rather than a well thought out and planned response. Also there were times*

when the participant's responses were so disparate that it was very difficult to synthesise and summarise them all." – Sarah

Sarah displayed a good level of reflective thinking and negotiation, as did James:

"I was feeling very blank about the subject, until I had read William and Matthew's contributions, and some others', and the cogs started to turn"- James

"Annechina - I guess I did make it seem like Curriculum was tossed out but I wasn't really thinking that way. I was thinking more that parts of the curriculum would be negotiable and students would have some choice. I am still considering how I feel about the issue of a completely negotiable curriculum - I know there are schools in the world who operate solely on ILP's where student decide what they will learn and how. It's an interesting thought!" – Sarah

Matthew, on the other hand, did not spend much time reflecting publicly on his own learning in either the discussion or his portfolio. However, his posts were clearly the product of much introspection and experience. He was adept in the role of facilitator:

"James, which attributes of the Transformational Attributes do you think are important or particularly appealing? If so, do you think they could be implemented by existing schools? – Matthew

This technique was successful in stimulating interesting responses. Another interactive technique Matthew used was to state his position and invite challenge:

"Maybe I am a bit idealistic but why not see where we can go. Pull this to bits please and take me on. Challenge my view of the future by all means." - Matthew

Sarah was unique in that her COLLES survey showed a relatively strong preference for more cognitive support from the teacher. In her interview, Sarah explained:

"I did feel that at times I would like to be looking at some of the writings of published authors rather than relying solely on the collected wisdom of the participants" - Sarah

However, Sarah's portfolio indicates some of her most valuable learning was from issues outside of the actual course content:

"At the completion of the unit, I felt that I had learnt about curriculum but that perhaps the three most lasting learnings were [about the processes of learning online; about the vulnerability of a student to criticism or being ignored; and that it's never possible to completely control learning situations]." - Sarah

The small group discussion successfully stimulated discussion, with roles beyond those explicitly set up by the structure becoming evident. Many examples of open and critical discourse are evident throughout the unit, and the students' reactions were very encouraging. Some students were uncomfortable with too much focus on student discussion. It may seem to be a lot of work to keep up with a discussion and uncover ideas - some students might prefer to learn directly from good papers or teachers. Some students were shy about 'exposing' themselves by being self-critical in a public discussion group. Matthew found a workable way to interact within the group, but other students may find it difficult to realise the benefits of self-critical reflection.

A continuing challenge is finding a working balance between three factors: the number of participants/viewpoints; the amount of writing each student should do; and the amount of reading each student can do. Students can easily feel overwhelmed by the many different life worlds exposed in open and critical discourse with strangers.

Although this latest iteration of the unit was very successful, we feel there is room for improvement in future versions. More tinkering is required!

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