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# Bridging the Gap from Skills Assessment and Problem-Based Learning: Lessons from the Coalface of Scholarly Engagement with Curriculum Development

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This reflective essay charts and reflects on the progress of a scholarly engagement in curriculum change. Grounded on planning for syllabus and assessment change in a first year university subject, it aimed at evolving that subject from skill learning to problem-based learning. The challenge was to develop problem-based curriculum as authentic, equitable and integrated curriculum for a large, multi-modal and novice student cohort. Using the opportunity for reflective commentary on the author's engagement of both curriculum development and scholarly process, the essay presents parallel narratives that describe the scholarly context of the case study, and predominantly, the author's reflection on his engagement with this. The former enhances the author's understanding of curriculum development, whereas the latter provides a foundation for self-learning and an awareness of his relationship with SoTL scholarship. In doing so, it provides a salutary tale reflecting the trials and tribulations of what is probably a common process

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Problem-based learning, Curriculum development, Reflective practice, Engaging SoTL

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## Bridging the Gap from Skills Assessment and Problem-Based Learning: Lessons from the Coalface of Scholarly Engagement with Curriculum Development

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### Abstract

This reflective essay charts and reflects on the progress of a scholarly engagement in curriculum change. Grounded on planning for syllabus and assessment change in a first year university subject, it aimed at evolving that subject from skill learning to problem-based learning. The challenge was to develop problem-based curriculum as authentic, equitable and integrated curriculum for a large, multi-modal and novice student cohort. Using the opportunity for reflective commentary on the author's engagement of both curriculum development and scholarly process, the essay presents parallel narratives that describe the scholarly context of the case study, and predominantly, the author's reflection on his engagement with this. The former enhances the author's understanding of curriculum development, whereas the latter provides a foundation for self-learning and an awareness of his relationship with SoTL scholarship. In doing so, it provides a salutary tale reflecting the trials and tribulations of what is probably a common process in universities: *ad hoc* curriculum development.

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"Why is it so difficult to change teaching and learning in a single classroom in higher education ..., not to mention ... at the institutional level? ... There are no guarantees for successful change to PBL." (Kolmos, 2010: 1,5)

"[Reflective practice is] the critical thinking required to examine the interaction ... between the researcher and the data .... The researcher explores personal feelings that may influence the study and integrates her understanding of the feelings into the [study] results .... The research needs to be reflective so that she can uncover and provide a full account of her deep-seated views, thinking, and conduct. This openness is necessary so that the readers ... are aware of how the researcher's values, assumptions, and motivations may have influenced the framework, literature review, design, sampling, data collection, and interpretation of findings. Being explicit about the [researcher's] participation ... in the generation of knowledge adds to the relevance and accuracy of the results ..." [Jackson, 2003: 223]

### Introduction

This essay represents reflection on my scholarly engagement with re-focusing a first year subject from skills to problem-based learning. While the planned conversion did not eventuate, my reflections on the process and role of engaging teaching and learning scholarship have been most instructive. Adopting a humanistic reflective approach, I present parallel narratives on curriculum change and reflection: my account of scholarly engagement with curriculum design is moderated by personal reflection, to illustrate the essential role that reflection played in the evolution of my scholarship. It provides, I

believe, a salutary tale, reflecting the trials and tribulations of what is probably a common process in universities: *ad hoc* curriculum development. This paper is, essentially, a first person account, a case study that should be transferrable to others' experience.

The study tackles curriculum redesign for a subject I have taught for some twenty years. Informally, I had already identified delivery issues: it had evolved beyond its original objectives; its philosophy and delivery were mismatched; and context had changed. In response, I sought to move from skills training to problem solving, using an environmental management handbook as the basis for student problem-based learning. I subsequently examined context and concepts to provide a framework for the re-write. Despite significant progress, I reflected early on that my initial expectations for an easy re-write were naïve; I now recognise the complexity of the task, especially given the diverse student cohort, and my desire to create a whole-of-subject problem-based learning activity. Had, I reflected, my long engagement with this subject engendered complacency? Had my ability to write textbooks (Boyd & Taffs, 2004; Boyd & Laird, 2006) blinded me to the needs of strategically managed curriculum change? Among other reflections, in retrospect I found myself to more aware of, but less self-confident and cavalier in, curriculum development. The elephant in the room became the corpus of taken-for-granted assumptions and behaviours amongst established academics.

This work turned out to be more constructive than the opening might imply, notably in helping me develop the practice of self-reflection. I had previously experimented with reflective commentary: teaching practice studies (Boyd, 1993; Boyd *et al.*, 1998), self-description, *post-hoc* reflective text (Boyd, 1996, 1999), personal practice reflection (Boyd, 2001, 2005), and a multi-speaker dialogue (Boyd *et al.* unpublished); here I deliberately adopted reflection *during and after* the process of curriculum development as part of my process of discovery.

Ideas of self-reflection and biographical scholarly writing have a long academic history that evolved with life story writing becoming a form of critical social analysis (Chamberlayne *et al.*, 2000). With social constructivism allowing biography to be read as constructed text and examined as social process (Silverman, 1997; Roberts, 2002), postmodern and postcolonial theory allow for complex theoretical critiques of the self, the other and community (Marcus, 1998), permitting a diversity of writing styles and structures (Chamberlayne *et al.*, 2000). Examples of academic autobiography abound, and self-reflection is now embedded in humanities and social sciences research (e.g. Roberts, 2002; Denzin & Lincoln, 2003a, b, c; Keen *et al.*, 2005). Bradford (2000: 44) notes that reflective practice provides "mental time and space to consider what [the academic has] been doing, value it, place it into context and make mature decisions about what to do next". This can be formalised into curriculum (e.g. Schön, 1987; Boyd, 2001, 2002; Charlesworth, 2004; Tomkins, 2004; Keen *et al.*, 2005).

### Trying to Bridging the Gap

My original aim was to develop problem-based curriculum for a large multi-modal first year class subject. I had taught this skills-based subject for some twenty years. My primary concern was that the skills focus masked opportunities to develop analytical skills. I now reflect that I had been increasingly disenchanting with the subject for some time. Was I seeking change to solve my own reservations, or to solve real educational needs? I considered it, at the time, an unsatisfactory subject that had outlived its utility and relevance. Later reflection validated my views of its out-datedness, content relevance and content-assessment disjunction. More recent discussions with colleagues, however, now confirm its academic validity, and I take a lesson in the importance of clarity of purpose for any curriculum (re)design.

The subject is delivered to a large first year class, both face-to-face and by distance education. Students, mostly in environmental science and management, with some from law, education and tourism, range across age, educational and life experience and prior learning. Unit delivery had conventionally been resource-supported laboratory- and field-based face-to-face; students are now provided a study guide, linked to the textbook (Boyd & Taffs, 2004); internal students attend lectures, practical classes and a field trip, whereas external students are provided on-line material and a lab- and field-based residential. True equity of student learning, learning support and student experience is elusive (cf. Morgan & O'Reilly, 1999), and part of my reflections considered the potential pedagogical inequity for different student cohorts; at that stage I was uncertain how to solve this.

In addressing these considerations, I created a new curriculum for students to use mapping and related skills to solve a management problem, rather than learn the skills for their own sake. I would use an environmental planning book I had co-authored (Learmonth *et al.*, 2007) as the basis for students to tackle a land use conflict issue. This new curriculum required me to review the assessment used in the subject, since I considered that new curriculum would not be well served by prior assessment (cf. Fullerton, 1995). The new assessment would be student-focused, and relevant (Brown & Knight, 1994; Boyd *et al.*, 1998; Boud *et al.*, 1999; Brew, 1999; Boud, 2000). My notes at the time reflected an excitement in the process: assessment was focusing my mind on practice and the opportunity to drop tried and tested practical exams and "old-fashioned" delivery and assessment, and take up a high-risk model of teaching and learning. Even latent concerns whether the students will be able to cope were tempered by this enthusiasm. However, in retrospect, was I putting the cart before the horse?

### **The Nature of Curriculum**

My reflective practice – especially those questions of purpose, relevance, and action sequence already touched on – now reminded me of the importance of understanding curriculum. I subsequently read and wrote much; here I try to capture the essence of that learning. While curriculum may be viewed as content, a broader perspective is instructive – examples include: Ornstein & Hunkins' (2004) curriculum as plan, learner experience, system, field of study, and subject matter; Barnett & Coate's (2005) "curriculum-design-in-advance" and "curriculum-in-action; Fraser & Bosanquet's (2006) curriculum as structure and content versus dynamic and interactive teaching and learning process. In the context of my work, the challenge now became one of generating the former to service the latter: how to manage the content within conditions of both teacher and learner circumstances, especially within the normal university constraints. I juggled ideas of learner experience, curriculum planning involving more than just education, and political and economic contexts. Aligning curriculum implied curriculum structure and process to be as simple as possible. I feared that this flies in the face of increasingly curriculum complexity, as external pressure imposes upon internal curriculum.

I was encouraged by the practical implications of curriculum-in-action espoused in Biggs' (2003) argument for student-centred teaching and learning, and aligned unit aims, syllabus and assessment. Practically, he reminds us to design for student learning rather than delivery convenience. This truism is, I have now become aware, easily overlooked. This may seem obvious, but reflects the pragmatic tension between (a) supporting and developing student learning, and (b) managing a diverse cohort of students under logistical conditions of constraint (cf. Lea *et al.*, 2003). Tension also rests within these opposites, between, for example, the ideal student-centred learning experience and the student's focus on assessment (Gibbs, 1995). With this in mind, I returned to the

literature on student-centred curriculum. Commentary from writers such as Bird (2008) Rowley (2003) and Ragland (2008) helped me validate, despite potential issues of delivery (Ling *et al.*, 2001; Bird, 2004), my choice of problem-based learning, *for this specific cohort of students and learning context*, as the preferred model.

My awareness of design for student learning rather than delivery convenience, was, I now reflect, not new. However, while I conceptually understood it previously, I now understood its implications more fundamentally. This critical threshold change for me, I now believe, allowed me to articulate the inherent tension between teacher-centred and student-centred curriculum as a challenge to my own performative shift from a long-established face-to-face teacher to becoming a truly on-line teacher.

### **Problem-Based Learning**

I have dwelt upon the early stages of this exercise at some length for a purpose; indeed this represents, in reflection, my own problem-based learning. In early drafts of this essay, my focus was on the curriculum itself, problem-based learning as a scholarly pedagogy, and the machinations of my own subject curriculum development. I realise now that this writing was as important, if not more so, than the curriculum development itself, since, while it allows me to marshal the literature on problem-based learning – perhaps for another paper – its real import was in drawing out my own critical learnings.

In this context, therefore, I simply put on record that there is a huge and expanding literature – extensive to the point of overwhelming – on problem-based learning (commonly reduced to “PBL”). Why should this be, and how does this help the non-PBL specialist curriculum designer? Perhaps Dangerfield *et al.*'s (n.d.:50) warning might cast some light on this: “However good PBL sounds in theory, students will be understandably unforgiving, if they personally experience sub-optimal implementation. Recent expansion of student numbers ... [may] compete with ... other commitments for stretched staff resources. The experiences of large cohorts of students in a PBL system might reflect, for example, [list of issues and negative effects] ....”

In summary, PBL supports students through the development of skills to tackle a problem, including devising and implementing a plan to respond to the problem, and evaluate both outcomes and the experience (Bird, 2008: 25). Normally this represents higher-order learning skills, but may lend itself to introductory studies (Letassy *et al.*, 2007). A significant issue is that much so-called PBL is week-by-week practical-based learning, much as most science departments have long been doing. Where useful, however, good PBL guides tend to focus on whole-of-course approaches (e.g. Dangerfield *et al.*, n.d.). The implication is that adopting PBL without whole-of-course follow-on may limit learning outcomes. Nevertheless, the practical nature of such guides allowed my planning to be guided through PBL curriculum development. I will not detail that planning here, suffice to note that I have files of detailed tables targeting, for example, “Key elements for successful problem-based learning”, “Problem solving approaches and their assessment implications”, “Elements of assessable evidence for problem-based learning”, all as they may apply to my specific context. Nor will I record here the diagrams I used to try to articulate my vision of the subject syllabus and assessment, past and present. And finally, neither will I record the flow of reflection on the practicalities of implementation. All these heuristics assisted my project. I will skip, however, to a closing reflection.

### **My Own Problem-Based Learning: Have I Bridged the Gap?**

I quote from my own reflective notes.

*The end! Have I arrived at somewhere new? Or simply justified myself? Or a bit of both? The model of the new-look unit has certainly evolved from the whiteboard scribbles ... way back in week whatever. It may still be cumbersome, and may hold some logistical surprises. It may, alternatively, streamline once I start the study materials. There are, after all, only four elements to [the syllabus]: [list ...]. The assessment model looks equally cumbersome: is this a function of being explicit about everything, or of the graphic I use; is it actually cumbersome and hiding surprises? But it does only contain relatively few components: meaningful formative assessment to facilitating student learning; targeted summative assessment to test students' knowledge and skills. What could be easier? Watch this space!*

*How have I got here? In retrospect I now understand that – and this may be the most important outcome of the project – I have moved from the position where "all" I had to do was work up new content and a new study guide. In retrospect, and clearly coming out of my reading of the literature ... writing new content became the least of my issues ... The big challenge ... is the demands, in converting to problem-based learning, on the practice of delivery and student engagement. Everything I read tells me that I need to develop quite different teaching skills, and, at present, a mastery of online delivery. That has become my major challenge. It has redefined the gap I have to bridge ...*

### **Closing Reflections: Conclusions?**

In attempting parallel narratives on curriculum development, I find myself increasingly critical of the curriculum development I would have taken for granted in my pre-informed days. My reflective narrative importantly provided insights into my relationship with both published teaching and learning concepts and practices, and the importance of context. I now have three parting thoughts. One: was I being realistic in wanting to develop a whole-of-subject problem-based learning activity rather than reverting to the week-by-week problem based-learning activities model? Two: should I have paid attention to the advice I have just given a new colleague: hire a young enthusiastic and skilled online educator to assist in the development and delivery of the new-look subject, and to mentor her (read me) through this change? Three: a quote: "Changes in teaching and learning styles are not a quick and easy matter. Change is a gradual process that involves both trying out new strategies and techniques as well as carefully considering the goals for which those practices are intended. Instructors are currently faced with a variety of challenges like large class size, diverse student populations, management problems, accountability pressures, legal issues, curriculum changes, and new technology. The use of collaborative learning strategies can make classroom life for instructors and students supportive, engaging, intellectually stimulating, creative, ... productive and fun." (D'Souza & Wood, 2003, p.8).

My lessons in this exercise may provide assistance in successfully negotiating D'Souza & Wood terrain. First, clarity of purpose; second, awareness of the taken-for-granted; third, fundamental understanding (rather than conceptual understanding) of the primacy of student-centred learning; fourth, the power of continuing reflection during *and* after the event.

So did these lessons help me? In a postscript, I now ask, "So what happened?" Can I demonstrate that my experience and reflection have resulted in successful development

and implementation of a new curriculum? In the event, "No". This may seem a rather blunt evaluation, but is more of a statement of history. Independent of my curriculum development, a course review reassigned the subject to a new place in the course, as a second year elective with specific focus on digital spatial and mapping technology. In what may be seen as an ironic twist, these events validate the view expressed by Dangerfield *et al.* (n.d.: 10) that "[curriculum] construct[,] content [... and] implementation ... need to be planned as part of a coherent system". The system was modified, and therefore curriculum needs shifted. And in a further ironic twist, I redeveloped, successfully, I believe, another subject as a PBL subject at a time of urgent need for change but with little formal planning and almost no lead-time. But that is another story ...

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