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Discomforting the Orthodox: Using debates in the pedagogy of curriculum and critical thinking in design and technology teacher education

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Abstract

Given the breadth of the design and technology curriculum enterprise, designing a broad-ranging foundation course for design and technology teacher education students is problematic. Matters of content, process, pedagogy, educational theory and curriculum politics all have their needs to be met and understood.

This paper describes how debates have been used to articulate these kinds of needs in meaningful ways for the students. The debates are not simply an 'activity' that fills the assessment menu. They are shown to be, at once, interweaver of multiple issues and questions, modeller of critiquing-designing-making activity, and developer of intricacy for holistic design and technology education.

The paper explains the significance of the context in which the students and course operate and it presents the associated pedagogical rationale. In recognising that discomfort, as a component of critical thinking, is both valid and positive, it seeks to show how this use of debating contributes to a meaningful educational journey for the students.

Introduction

For apart from inquiry, apart from the praxis, men (sic) cannot be truly human. Knowledge emerges only through invention and re-invention, through the restless, impatient, continuing, hopeful inquiry men pursue in the world, with the world and with each other.

(Freire, 1972:46)

This paper discusses the context, rationale and the underpinning theory of using debates to meet some of the multiple requirements of a foundation design and technology (D&T) course (subject) in a particular teacher education program (degree). The device of using debates has been used with graduate and undergraduate D&T students by the author since 1994 in two universities. Consequently, it has undergone continuous revision and refinement.

The paper is broadly in two parts. The first addresses the detailed context that must be considered – perhaps, the design variables to be met. A key point is that 'using debates' is not

merely 'something for the students to do'. Rather, it is a pedagogical device, or strategy, developed as part of a holistic methodological approach to the complexities of 'just what should we give students in their first course of their design and technology teacher education?'. The second section addresses the pedagogical rationale – the reasoning and theory underpinning the strategy.

The variables under consideration

In response to a complex set of circumstances, the pedagogical device of debating has evolved as a useful tool. In outline, the range of considerations which have informed the pedagogy are:

- the pervading curriculum climate;
- the nature of the program;
- the breadth of material to be addressed in the course;
- the wide-ranging backgrounds and destinations of the students; and,
- as will be seen below, a desire to meaningfully model diverse pedagogies to would-be teachers.

The pervading curriculum climate

There are general educational and political contextual issues to consider such as: the continuing challenges and developments in (design and) technology education across the world; the impacts of globalisation on education and the profession via the so-called knowledge economy (see, e.g. Keirl, 2002; Hargreaves, 2003); the continuing evolution of technological practices; a conservative political climate in Australia with education being foregrounded in elections with talk of 'back to basics' and 'reform'; and, with all of these, continuous reshaping of curriculum (Harris & Marsh, 2005).

Design and technology itself has its ongoing struggles for status, recognition and understanding at all levels of education as well as in the community. Curriculum decision-makers are rarely well-informed about design and technology's educational significance and potential. Most students who enrol have their views of what constitutes design and technology seriously challenged in their early weeks in the program. It is also true to say that their views of education in general are challenged in an ongoing way throughout their program – such is the need for the 21st Century profession to engage in reflection, research, enquiry and social justice (Groundwater-Smith et al., 2003).

The local context is provided by the South Australian Curriculum Standards and Accountability (SACSA) Framework (DETE, 2001a&b). Aspects relevant to this paper are that:

- it is a *framework* intended for professional interpretation according to local needs;
- assessment is articulated through standards and outcomes and makes rich use of teachers' professional judgement (Kimbell, 1997)
- it is organised into eight *Learning Areas* (these are not subjects). The Design and Technology Learning Area can embrace workshop-based D&T, Home Economics, ICT, Agriculture etc; and,
- the Design and Technology Learning Area is articulated through three strands – Critiquing, Designing, and Making (CDM).

The nature of the program

The pedagogy reported here is a component of a 4.5-unit foundation course delivered in a 72-unit Bachelor of Education program at the University of South Australia. Such a weighting is normally a two-year load but this program is delivered in eighteen months. The program is graduate entry, that is, it is premised on students arriving with a degree (or equivalent) as a knowledge base appropriate their destination teaching.

The D&T Learning Area studies prepare teachers for the range of school subjects described above. Within the program, students undertake five Learning Area-related courses to prepare them in the pedagogy of the field. However, students are also encouraged to prepare in two Learning Areas. This means that many students undertake only two or three D&T courses.

As with all the programs at the university, this degree must deliver not only its content but also contribute to the university's seven Graduate Qualities. Briefly put, these require that graduates:

- operate effectively with and upon a body of knowledge;
- are prepared for lifelong learning;
- are effective problem solvers;
- can work both autonomously and collaboratively;
- are committed to ethical action and social responsibility;
- communicate effectively;
- demonstrate an international perspective.

Both the Graduate Qualities and the SACSA Framework valorise students as future citizens, that is to say, design and technology cannot be viewed simply as content. The former is concerned with citizens as professionals while the latter is concerned with the general education of all citizens as much as with any domain-specific knowledge.

The breadth of material being addressed

For the foundation D&T course, of which the debating offers a key role, the breadth of the coverage is significant. The following content is to be addressed in 150 hours of which approximately 40 would be in a class environment. (Throughout, the Graduate Qualities are to be modelled too).

Clarifying design and technology curriculum; equity issues and their inter-relationship with technology; change and futures issues; questions of balance – the generalist-specialist continuum; product-process interplay in design and technology education; balancing knowledge, skills and values; assessment problems; competing interests of stakeholders in the design and technology curriculum; design processes and outcomes; identifying personal knowledge and potential.

The wide-ranging backgrounds and destinations of the students

The cohorts comprise 20-24 students with a rich variety of prior qualifications from: design degrees, engineering degrees and IT degrees, as well in architecture, food technology, fashion, agriculture, viticulture, environmental studies and so on. If an applicant has a strong technological or design component to their qualification, and that component can be articulated into schools' curriculum, then they are accepted into the design and technology courses of the program.

Prior degrees are not the only consideration of an applicant's profile. A small minority of these students have moved directly from school, through a first degree and then into this award. About a third also have trade or technical qualifications. Some arrive in their early fifties embarking on a third career. Additionally, many students have paid work commitments to make their way through university; and, many also have family commitments.

From such a profile come the makings of a dynamic which influences what and how to teach, or work with, these adults. First, is the vast amount of knowledge in the room. Each student knows far more than their D&T lecturer about their own particular field. Second, all in the room have rich life and work experience on which to draw. They bring personal values systems that include the political and the spiritual. Third, the lecturer, by virtue of her/his professional knowledge, initiates the students in design and technology education.

The place of the debates in the course

Apart from the contexts described above, the debates should be understood for the part they play within the course. Of the 100% of assessment allocated across the 4.5 units, 40% comprises Design Projects, 40% to an issues-based essay, and

20% to the debates. The teaching throughout the thirteen weeks adopts multiple strategies to model different styles for students to use. Similarly, different assessment approaches are used as models too. The combination here serves to model how authentic pedagogy and authentic assessment serve a holistic, rather than an atomistic (Kimbell, 1997), approach to effectively integrating the Critiquing, Designing, and Making strands. In effect, it also mirrors this paper's opening Freirian reference to the human-ness of inquiry, praxis, and invention/re-invention.

The debates are assessed against three criteria: coverage of the topic; clarity and conciseness of argument; and, entertainment value/audience engagement (rated in the proportions 2:1:1). Topics are issued in Week Three and debates take place around six weeks later. Thus, students of varied backgrounds who have only recently met find themselves in a team needing to research, collaborate and prepare in what seems like a generous timeframe but, in reality, is rather tight. (By this mid-semester period, work from five courses may be due.)

This paper cannot address the myriad nuances and creative approaches which have been thrown up over the years that the debates have run. It is anticipated that the paper's audience, as design and technology practitioners and professionals, will recognise the debates' potential in addressing course content, interacting with the complexity of the associated issues, and giving students opportunities for argument clarification and critical thinking. It would also be recognised that what the students encounter amounts to a design brief. Thus a pedagogy of C&D&M is capable of continuous enrichment (by iteratively enhancing it's own capacities) whilst also contributing to the general education of all students.

The four topics are:

- *It is the product, not the process, which is important in design and technology education.*
- *Design and technology education's primary role is to meet the needs of the economy.*
- *Design should not be a part of technology education.*
- *The purpose of design and technology education is not to prepare 'specialists' but is to contribute to the general education of all people.*

These debates articulate issues that are central to both D&T teacher education pedagogy and D&T's curriculum struggles. In their way, they also contribute to the Graduate Qualities and respect the students' backgrounds. In the sense that design and technology's identity is about its capacity to remain dynamic (not a fixed pedagogy or body of knowledge) and

holistic (continuously interweaving its own rich processes), that identity is a manifestation of a technological literacy serving not only the field, but also education- and society-at-large.

Pedagogical rationale

The use of debates is not to replicate the (formal and positivist) school debating club, nor is it simply 'doing something different'. They have richer purposes. For students who are entering the current educational climate, who are to be able to advocate and defend design and technology education, who are themselves going to be active citizen-professionals, and who are going to be contributing to their students' general education in some significant ways, having capacities to inquire, reflect, think critically, argue rationally, and to act, are going to be useful. Further, as novice teachers, they will similarly need strategies to facilitate meaningful learning experiences for their D&T students – experiences which both serve design and technology education as well as the curriculum that helps school students become thinking, enquiring citizens themselves.

The debate topics have been selected, worked and re-worked over a lengthy period. Some topics have been trialled and adopted, others dropped. While 'big issues' such as democracy and ethics certainly have their interplay with design and technology (Keirl, 2006), their place in this arena is limiting. Conversely, topics of the 'mobile phones are a boon to society' type, whilst illuminating and educational in their way, are too specific for this device.

The debate pedagogy is also informed by constructivist learning theory where there is an interplay of the theory with the debate approach without there being total congruence. Here, students are 'appropriating and constructing' their own knowledge (Featherston, 2006:153). Featherston cites the Western Australian Curriculum Framework which, in part, talks of students '...connect(ing) new experiences to what they already know and can do, while at the same time reconstructing what they know and can do to take account of the challenge provided by their new experience.' (Featherston, 2006:153).

In turn, this interplay of pedagogies and the debate process – for those partaking – becomes a critique-design-make exercise in itself. Thus, in analysis after the completion and assessment of the debates it is possible to critique with the students a) the debate topics – their manageability and the issues they raised; b) the debate as a pedagogical device – the learning and modelling represented; c) the process of the debating – the learning and the personal and interpersonal journeys; and, d) the gestalt – the significance of the whole as a result of design

(by lecturer) and of the journeys travelled (by students). Thus, a 'winner' is not determined. This would be problematic since the topics, like some design briefs, are intentionally open. The audience, by design, engage with the issues, and the assessment, by the lecturer, is a blend of qualitative commentary and responses to the set criteria

In contributing to students' Graduate Qualities and enhancing their capacities to be effective and knowledgeable D&T professionals, adult learning theory is drawn upon. Saunders (1999) summarises the many research findings on group dynamics affecting adult learning. Amongst others, she cites group norms and goals, cohesiveness, relationships, the greater potential of the group over the individual, the self-learning and interpersonal learning that takes place, the learning from shared decision-making, differences in behaviours within and between genders, how learning in a group can be a negative experience, and, issues of dominance, marginalisation and reluctance to contribute.

Ramsden (1995), assembles three theories of higher education: teaching as telling or transmission; teaching as organising student activity; and, teaching as making learning possible.

(The first) assumes that content knowledge and fluent presentation are enough for good teaching. (The second) complements this picture with additional skills focused principally on student activity and the acquisition of extra teaching techniques. (The third) presupposes all these abilities and extends the understanding of teaching so that it becomes embedded in the nature of subject knowledge and the nature of how it is learned.
(Ramsden, 1995:116)

If the modelling of pedagogy is to be a dimension of the educational design of debating for prospective D&T teachers, then it is also worth drawing on the theorising and research from the school sector. The well established and extensively researched work of Joyce et al. (1992) shows how this pedagogy forms part of both the 'social' and 'personal' families of teaching – in the former through a 'partners in learning' approach and 'jurisprudential inquiry', and in the latter through hands-off or 'non-directive teaching'. The work of these authors respects and reflects the research on learning styles too and their final chapter 'Learning Styles and Models of Teaching' is subtitled 'Making discomfort productive'. As this paper's title suggests, the idea of discomfort is viewed usefully and positively. This is not to abandon, scare or neglect students and their learning but, rather, to articulate the significant experiences gained by having one's values and understandings brought into question – whether for affirmation or revision.

The questioning of orthodox views and positions goes against the grain of current educational conservatism where the status quo is to be maintained (Apple, 2001). But there can be no doubt of its defensible position in democratic education for democratic life. This in Freire's (1972) thesis and his arguments for creative intelligence stand against what he has termed the 'banking' concept of education with knowledge being deposited (in the passive student). While it is true that much D&T activity may be student-centred, there is much that remains transmissive (Ramsden, 1995) and largely teacher- or syllabus-determined.

In preparing teachers who are to be not only competent and confident practitioners of design and technology, the aim is to develop in them traits to assemble arguments, to advocate and defend their field, and to understand design and technology curriculum not as defined and stable entity but as part of the dynamic whole that constitutes education at large. This, so far as their own values are concerned, requires critical thinking and will involve some discomfort.

These pre-service teachers also learn that 'issues' – which are so closely intertwined with technologies – can be explored in many other ways in the classroom than by debating (see, e.g. Stradling et al., 1984; Lemin et al., 1994; Burgh et al, (2006)). A mistake in using debates is to simplify issues to naïve or unhelpful binaries. In so far as complexity in relation to controversial issues is concerned, Stradling et al. (1984:115-116) advocate a process approach whereby students acquire capacities to: critically diagnose information and evidence; ask awkward questions; recognise rhetoric; and, 'cultivate tentativeness'. Such an approach can richly serve both debate preparation and student development.

'Critical thinking' is often used as a catchcry for something desirable to happen in the classroom when the fact is that the thinking being engaged is anything but critical (see e.g. Postman, 2000). However, Postman is perhaps less aware of some of the well-grounded work supporting critical thinking in education. When designing learning experiences like the debates, work such as this is invaluable to all parties – those undertaking the debates (as both student and would-be teacher), their lecturer and, ultimately, the profession and school students. The work of authors such as Paul (1995), Thomson (1999), Cottrell (2005), and Burgh et al. (2006) all offers quality guidance that is soundly based in learning theory while also offering practical strategies for developing critical thinking skills.

A chord that resonates richly with the CDM philosophy is struck by Paul when he says: 'Critical thinkers critique in order to

redesign, remodel, and make better.' (Paul, 1995:526). All such authors are concerned with the quality and effectiveness of reasoned argument, with clarifying the affective and the ethical, with critiquing information, propaganda, and making sense of continuous change.

Conclusion

The debates, as they are designed, draw upon all the theoretical and practical material that has been discussed. This is not to say that a theory has been chosen and then put into practice. The journey has been typically iterative. The idea was trialled, developed and continuously refined. Learning happened through the interaction of all parties, through reading, research, professional development, and conversations with colleagues. To consider the range of contextual variables cited is to consider no more, or less, than a typical Critiquing-Designing-Making experience. Intricacy comes where the design is at once both 'learning that doesn't feel like learning' (in the orthodox sense) and 'teaching that doesn't feel like teaching' (in the orthodox sense).

The lecturer initiates but thereafter the learning is managed by the students. To paraphrase Ramsden (1992), the understanding of the teaching becomes embedded in the nature of subject knowledge and the nature of how it is learned. Perhaps the phenomenon can be expressed as starting with interweaving (in a crafting sense), moving into a pedagogical intricacy, which hopefully becomes an intimacy (in the sense of deep-seatedness) of all players and variables.

The culture that is sought from the preparation, through the debates, into the class inquiry, and beyond this foundation course, is one of shared learning. As Midgley puts it: 'In general, the job of enquiry is not to set up a competition and to choose one view as the true one. Instead, it is to build up a composite picture from them all.' (cited in Burgh et al., 2006:30).

As Layton (1994) emphatically showed, '...the politics of technological literacy - who creates and controls the meanings of the phrase, how the imposition of meaning is attempted - is a central concern of technology education today.' (Layton, 1994:13). This remains the case. As design and technology finds itself to be a curriculum project continuously caught up in the change agendas and circumstances of the evolving world, it matters that its teachers are able to engage in those agendas and circumstances. For this, they will need substantial curriculum understanding, capacities of critique and articulation, realisation that the orthodox need not be so, and, a recognition that discomfort is actually quite productive.

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