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TRANSDISCIPLINARY EDUCATIONAL DESIGN: CREATING A STRUCTURED SPACE FOR CRITICAL REFLECTION ON E-LEARNING ASSESSMENT PRACTICES

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Abstract

Many academic staff are experiencing the multiple challenges and pressures of increased teaching loads, e-learning design and developments, ongoing research including the scholarship of teaching, as well as fiscal accountability. No wonder most lecturers have little time or energy left for the long-valued processes of critical reflection. This paper describes an educational design initiative of three cycles involving academic staff from a range of disciplines who came together with reference librarians and technical support staff in a series of meetings to reflect in a structured action learning process on their practices of designing assessment for e-learning. Creating a structured space proved to be a catalyst for staff to critically reflect on their practices and engage in transdisciplinary discussion. Where they are not hindered by postgraduate study in their discipline area, academic staff are likely to publish about their research into teaching, based on their critical reflection on practice.

INTRODUCTION

The potential importance of critical thinking as a contributing factor to a healthy, democratic society is widely recognised and was the subject of much public debate in the US in the mid 1980s (*Involvement in Learning* (National Institute of Education, 1984), *Higher Education and the American Resurgence*, (Newman, 1985)). Brookfield also (1986) refers to various major reports that call for the development of critical thinking as a national priority, and comprehensively discusses the importance of critical thinking. Hechinger (1987: 27) writing in *The New York Times* reports that “public schools have discovered the importance of critical thinking and many of them are trying to teach children how to do it.” Unfortunately the reality does not always match the rhetoric: “What a sad comment on modern educational systems that most learners neither value nor practise active critical reflection. They are too busy studying to stop and think. Sadder still, many educators don’t reflect either. They must be too busy ‘teaching’” (Hammond & Collins, 1991: 163).

Critical thinking, critical reasoning and critical self-reflection are each described in the literature as processes that underpin effective and reflective action. Barnett (1997) defines the three skills of criticality as critical thinking, critical action and critical self-reflection that can be drawn together as part of becoming a ‘critical being’. In adult education literature the writings of critical theorists, Mezirow (1990) and Brookfield (1995) have explained the importance of perspective transformation, contextual awareness and imaginative speculation. Developing skills in critical thinking and critical self-reflection are thus vital to deep learning. Current initiatives in Australian higher education to identify graduate attributes and embed their component knowledge, skills and values across the undergraduate curriculum is a broad-based and clear effort to ensure that all components including these higher order practices of critical thinking and self-reflection are given more than just lip service, and are indeed evident in university programs as a matter of course.

To progress this learning experience to the next level, transformative learning as depicted by Mezirow (1990), requires the ability to critically self-reflect, to question one's values, beliefs and assumptions in order to evaluate alternative perspectives, reassess and proceed through a shift in stance to take considered action. The proposition is true for both students and academic staff and had already been developed by Schön (1983) in the applied contexts of reflection-on-practice and reflection-in-action. In the context of higher education, taking the time to conduct a 'reflective conversation with the situation' provides lecturers with an opportunity for the complementary processes of thinking and doing. Commonly, these opportunities are found during formally structured subject reviews and program reviews, where input on teaching and assessment practices is sought from a range of sources including student feedback, independent assessment of teaching approaches by central units such as a Teaching and Learning Centre, anonymous cross-institutional peer reviews and the less formal dialogue which takes place with colleagues. The benefit of regular opportunities for review is to highlight assumptions about what we know from our academic experience and research, and reveal how these assumptions can at times limit the scope and depth of our reflection.

In the case where teaching and assessment must now be designed to take account of the e-learning environment with all its strengths and limitations, academics are faced with many decisions and must choose some level of critical self-reflection when moving their well-worn activities of student assessment into the still evolving e-learning context. Questions of what works best off-line versus what might be enhanced through a design for online implementation must be considered along with the academic's own contextual issues based within the discipline. What may be relevant and suitable for a science-based discipline e.g. online multiple choice quizzes, may be inappropriate in the field of say, cultural studies or sociology.

This challenge to reconceptualise teaching, learning and assessment with the e-learning environment in mind, might be less intimidating if linked with a process of consultation with a 'critical friend'. Having a colleague or group of colleagues with whom to discuss and share reflections facilitates the process of enquiry. Another person's perspective on your taken-for-granted values, assumptions and beliefs makes possible the self-reflection that leads to perspective transformation and considered action.

BACKGROUND

Southern Cross University's (SCU) process of embracing e-learning can be seen as fairly typical of institutions in Australia that have had a history of both distance education and on-campus classes. Various aspects of this process have been comprehensively described in a series of publications by SCU staff extending over the decade beginning in the mid 1990's: Debreceeny, Ellis & Chua, (1995), Ellis, Debreceeny & Hayden (1995), Ellis, Wildman & O'Reilly (1996), Debreceeny & Ellis (1996), Ellis & Debreceeny, (1997), Ellis, O'Reilly & Debreceeny (1998), Ellis & Debreceeny (1999), Ellis & Phelps (1999), O'Reilly, Ellis & Newton (2000), O'Reilly & Brown (2001), Ellis (2001), Burnett, Skamp & Ellis (2002), Phelps & Ellis (2003), Byrnes & Ellis (2003), and O'Reilly (2004).

The e-learning context has been utilised to facilitate enhanced interaction for off-campus learners and to support access to digital information for all (Ellis & O'Reilly, 2001). The reconceptualisation of assessment for the e-learning environment has been the subject of exploration by many academic staff at SCU and is the focus of research for others (Phelps, 2002; Rowe & Vitartas, 2003).

Since 2002, new research into educational design practices at SCU has taken the form of action research and involved three cycles in which action learning sets have included academic staff from varying disciplines, reference librarians and technical support staff. In each case three academics, one librarian, one IT staff member and the researcher comprised a set. These sets of six staff have met on a regular basis in order to design, implement and evaluate student assessment for the e-learning environment. Each of these three cycles occurred over one semester (16 weeks) between 2002-2004. The importance of the diversity of disciplinary backgrounds of participants was explored during the sessions and is further discussed in this paper. The second focus was the action learning process which has two important characteristics (a) individuals reflect on their ideas aloud, and (b) silences are not interrupted as they are a recognised component of the structured space.

In each of the three action learning cycles the input of technical and library staff was of mutual value for informing the feasibility and efficacy of proposed assessment design. Their appreciation for being included at a planning stage

has been explicit and profuse. Some of these case studies have been previously described (O'Reilly, 2003, 2004) and point to the value of transdisciplinary discussions of assessment design. Tab. 1 shows the disciplinary fields of each of the academic staff who participated in the action learning sets, the method of assessment they were designing for e-learning, and the consultations they undertook over and above the discussions they each had with educational designers and the transdisciplinary research group.

Case	Discipline	Assessment method for e-learning	CF	SoT	PS
1.	Accounting	Online literature search, discussion with alumni	√	√	
2.	Complementary Medicine	Lock-step scenario-based cases for clinical diagnosis			√
3.	Environmental Science	Sub-committees for conference		√	
4.	Human Movement	Business related role play			
5.	Maths	Timed online quizzes			
6.	Politics	Simulated local council meeting	√		√
7.	Psychology	Consultation with clients (future implementation)	√		√
8.	Social Sciences	Online quizzes	√		
9.	Sociology	Debate			√

Table 1: Consultations with Critical Friend (CF), Scholarship of Teaching (SoT) activities and Postgraduate Study (PS) are indicated by ticks

Scholarship of Teaching (SoT) is an index of willingness by the academic to disseminate insights from their teaching innovations via the publication of research relating to their teaching experiences. Related to this is the Postgraduate Study (PS) index, which refers to any postgraduate study being currently undertaken by the academic staff member.

Only two academic cases have had no additional consultations with a Critical Friend (CF) and are not currently undertaking either postgraduate study or scholarship through publishing. One (Case 5) recently became the only staff member in her field of knowledge in her department. Prior to the retirement of her colleague, they saw each other as mutual critical friends for discussions on curriculum. The other (Case 4) had recently moved campuses, become course coordinator of a new program and supervisor of four new staff, all inexperienced in University teaching.

During the action learning cycle, one academic (Case 7) made a decision to implement the e-learning assessment design at a future time. She felt through reflective judgement that because her students were not off-campus, her design for an assessment task needed to be a more authentic implementation of the e-learning environment. Through her self-questioning of why graduates might consult with their clients using the Internet, she decided to use this strategy within an assessment scheme in a future semester to explore the potentials of online consultations.

CRITICAL REFLECTION THROUGH ACTION LEARNING

The rationale for establishing action learning sets in the process of designing assessment for e-learning was founded in the dual purposes of 'action' and 'learning'. The idea was to provide staff the opportunity to learn from their shared experiences while at the same time achieving their work goals of designing, implementing and evaluating methods of student assessment as they moved into the e-learning context.

In this setting, academic staff used the shared discussions on the design of online assessment as a focal point for reflection and reported that the 'airspace' allocated for them to think aloud about their assessment designs is a luxury not usually afforded in their daily teaching and research activities. This concept of 'airspace' is described by Weinstein (1995) as the time and space for each individual to share their story with the group, and as each stage of the research progresses, the story evolves in its detail. "Time and space for each individual is a key element of action

learning. It is an opportunity – rare for most of us – to be listened to with total undivided attention” (Weinstein, 1995: p.157). The IT member of one action learning cycle commented:

... what I appreciate about the ‘air time’ is being able to focus on each individual person and their issue at one time... listening to other people in this way allows me to focus on the specific issues... that’s different from usual [IT training context] when I’m getting things from all over at the one time and I get very, very little time to sit there and just focus on one issue without the input from a thousand different things going on... so it allows you to slow down and... really pay attention to a particular issue. It would be nice if that could always happen but it can’t... I multi-task all the time... that’s the nature of my work.

Reflection on each individual’s assessment design and decision-making process took place in a structured way where active listening of each participant in turn was followed by questioning and probing for the possibilities of change in each individual’s thinking and their plans. Here is an example of such an exchange between two participants talking about their own subject (i.e. unit) towards the end of a session:

Case 7: it’s your enthusiasm that comes across for example in my unit if I engendered that much energy it would run [online]

Case 1: but I also think that you need caution about feeling like you have to jump into the deep end. It really goes to something [Academic 9] brought up much earlier about discussions, about exercising professional judgement and involving people from outside the unit and so on... if a really important part of the unit is personal contact then by going online you don’t need to and you shouldn’t be excluding that. What I think is “OK, how can that experience be enhanced by the online delivery mechanism?”...

The greatest benefit to be derived in this action learning situation is if each member of the set brings their own problem or issue for consideration and attention. The manner in which these sets were established suggested to both the IT staff and the librarian that the sessions were mainly for the academics and that they were there to support the academics in their design task. Once this notion was revealed explicitly it was possible to invite the support staff to use the sessions for their own benefit as well:

IT staff: [action learning] is of benefit to me, getting to know individual academics... it makes it easier for people to come to me and have their questions answered... it takes time being seen and getting known, so this helps.

CREATING A STRUCTURED SPACE FOR REFLECTIVE DIALOGUE

The reflection process is of course something that staff might be in the habit of carrying out on their own, however, in all cases reported in this research the appreciation was clear for a structured opportunity in which this reflection could take place in an iterative and shared manner. The pace of sessions and their inherent rules of accountability to the group, mutual confidentiality and a respect for silence were vital elements in the development of a sense of a space reserved for insightful reflection. Speaking aloud to others in reflective dialogue also has value for making one’s understanding explicit to self and others, and integrating these insights in a way that is free from self-deception (Brockbank & McGill, 1998).

Case 8:... even though I’m co-authoring the study materials with a colleague, we have very little opportunity to actually speak to each other about what we’re doing... people here are a captive audience and look like they are interested... and in speaking I really have to think about what I want to achieve... I don’t get that opportunity with anyone else because my colleagues are all busy and they are not interested in anything else.

Reflections occurring during the sessions were of obvious benefit to the members if they chose to take their insights back into their work. This questioning insight (Revens, 1987) can be seen when the issue of allocating time for reflection was answered by one member:

Librarian:... in my job there’s also a quick turnover with enquiries... it’s not a good job for being able to concentrate... you just get out of the habit of it... we do our work in sound bites, you might say... it would be handy to have more time. Next year when we have a new system of rosters, we’ll

be able to get out to the schools more and take a more proactive role... it's been a good thing for me to see in these sessions just what time pressures the academic staff are under...

This theme of time continued to come up in the process of designing assessment for the e-learning context and a variety of confounding factors emerged including the impacts of organisational change:

Case 4: I've tried to do something different [in terms of assessment] to blend in with the rest of the course... since becoming the course coordinator I've had to help the new staff into this course. It's been good to bring the issues here for discussion.

Case 9: I didn't actually end up doing anything magic and wonderful, which is what I'd meant to do... mainly because of a number of other things – we're going through the process of trying to put the two schools together and so that imposed a whole lot of things that ate into my time. In the end it came down that I only had a very small number of students who were enrolled online and so from a pragmatic point of view I didn't run it then as a fully online unit... mainly 'cause that meant that I would be involved in three modes of teaching and given all the other imperatives on me, I decided that discretion was the better part of valour.

Action learning sets were configured from staff who were not familiar with each other and came from a diverse range of disciplines. Their sense of safety in the group came from the stated rules and agreements of confidentiality and mutual regard agreed to from the start. All participants were very open in each of the sessions and a great deal of honest sharing went on, often prefaced by a phrase such as... "I'm talking out of school now, but...". The space was made non-threatening by the absence of disciplinary colleagues who may have found the reflections confronting or unsettling to the status quo.

TRANSDISCIPLINARY DESIGN OF ASSESSMENT FOR E-LEARNING

A transdisciplinary approach to educational design has been suggested as a collaborative process that allows time for consideration of one's own ideas together with the creative input of colleagues from other disciplines (O'Reilly, 2004). The process enables integration of a diversity of disciplinary perspectives into a problem-focused approach to design of assessment for the e-learning context. The inclusion of both academic and support staff further ensures a diversity of input.

While the benefits of bringing multiple perspectives to the teaching and learning context can readily be found in the literature on student learning, these benefits must also be linked to academic staff development procedures. The bringing together of academic staff and support staff into an action learning set for the development of assessment for e-learning has been shown to engage what might be called social constructivist processes through discussion and formulation of a transdisciplinary framework for assessment design:

Case 2: The fact that all of us have such different... well we have such a diverse way of assessing... is both good and bad. In one way it would be good that we had a closer type of assessment, but then at the same time it's really good to hear of the way other people assess.

Case 3: One of the things that came up for me was how to implement hands-on practical assessment tasks for off-campus students... I've decided to start a phase of learning by doing (both independently and in the group) to build on my understanding of online assessment

Case 4: I've spoken to our reference librarian, and she is keen to get involved [in supporting students through the assessment process]... she'll be quite an asset.

In the same way that effective staff development for e-learning and assessment needed to take a leap online to enable staff to experience the authentic context for themselves (Ellis, O'Reilly, & Debrecey, 1998; O'Reilly & Brown, 2001), the impact of transdisciplinary discussions in the process of designing assessment can also challenge staff to appreciate multiple perspectives in assessment and thereby enhance the experience of student learning. When reflections can occur in the company of colleagues from other disciplines, this creates a structured space for academic staff to explore a variety of options and challenge their own views, or the traditional views held within their own disciplinary context.

Becher's (1987) descriptions of disciplinary differences and in particular, his matrix which distinguishes between "hard" and "soft", "pure" and "applied" disciplines (Becher, 1996) has served to establish a firm foundation from which to investigate alternative views on this question of disciplinarity. When academic staff from a range of disciplines can be brought together for a common goal such as designing assessment for the e-learning context, then their discussions might be termed transdisciplinary and resemble the processes described by Gibbons et al (1994) as being Mode 2 knowledge production. While Mode 1 knowledge production is generated within a disciplinary context and is based upon an assumption of shared values, "Mode 2 knowledge is created in broader transdisciplinary social and economic contexts" (Gibbons et al., 1994, p.1). It is more socially accountable and reflexive and is characterised by being produced in the context of application and having a transdisciplinary function. Mode 2 knowledge production is thus very suited to collaborative educational design and readily supports the kind of perspective transformation evident in the current research (O'Reilly, 2004).

In his newly proposed theoretical model, Goodyear (2004) describes the use of 'patterns' and 'pattern language' to sustain a balance between rigour, prescription and creativity in the processes of educational design. The model describes the encoding, sharing and use of knowledge for educational design through a series of iterations of design decisions. These cycles of design would capture the relevant practices and theories, while observing and developing the relationships between elements of the design pattern e.g the learning objectives, the syllabus, activities and assessment tasks. The tasks (e.g. online discussion), their organisational forms (e.g whole of class), and the tools and resources to enable these (e.g. discussion board) would be the subject of design decisions within the pattern framework. This notion is compatible with transdisciplinary educational design because by using design patterns in this generic and interactive way, it may be possible to promote transdisciplinary design discussions more effectively.

ACHIEVING SUSTAINABILITY THROUGH A SCHOLARSHIP OF TEACHING

As shown in Tab. 1, only two academic staff who have been involved in the action learning process are also engaging in scholarship of teaching such that they have been publishing conference papers and journal articles concerning their innovations in e-learning and assessment. By contrast is the fact that four other academic cases are in the process of completing their own postgraduate studies and not yet publishing on their teaching practices. With the limitations of such a small sample in mind, it is still of some interest to consider the constraints presented by disciplinary research to the potential publication of research on teaching. While this might be understandable, Ramsden, *et al.* (1995) report the limited use in Australia of methods such as teaching portfolios, critical peer review and evidence of the scholarship of teaching in the pursuit of recognising and rewarding good teaching.

The research reported in this paper shows that, given the structured space and time for reflection, academics engage in a process of transdisciplinary discussions over the semester to come up with valid assessments for the e-learning context. They can also begin to capture their reflections into papers for publication:

Case 1: My publication focus emerged through the discussions within our group. After a while I thought "hey, I've got something that's worth talking about with others". That caused me to reflect further on what I was doing and to recognise that it was new and different in terms of teaching in my discipline area... when a colleague suggested I co-author with him, that's when I decided to draft a paper for an educational technology style conference, for a change.

The potential for continuous improvement in teaching practice and enhancement of students' learning is made possible through sustained and systematic commitment to reflective practice. The notion of continuous improvement in higher education is founded on these concepts of critical reflection, action learning and dissemination of insights through publication and collegial discussions. It is clear from the case in point that academic staff who are engaging in the scholarship of teaching "seek to understand teaching by consulting and using the literature on teaching and learning, by investigating their own teaching, by reflecting on their teaching from the perspective of their intention in teaching while seeing it from the students' position, and by formally communicating their ideas and practice to peers" (Trigwell, Martin, Benjamin, & Prosser, accessed 21/9/03). Their publication output, while being about teaching and learning within a disciplinary context – is not restricted to disciplinary research itself.

CONCLUSIONS

Processes of reflection are vital for critical review of teaching, learning and assessment. This paper has reinforced the notion that critical friends are useful when developing one's own ideas for assessment in the e-learning context. Group reflections are particularly effective for stimulating creative ideas and deepening reflection on one's own practice. More powerful still can be the discussion of assessment design that occurs among a transdisciplinary group of colleagues. A structured transdisciplinary approach to educational design is found to be effective when a group of academic and support staff can spend time over a number of weeks to critically reflect and relate about common issues such as designing, implementing, supporting and evaluating assessment processes. In this way Mode 2 knowledge production can be seen in action.

The research reported in this paper is a component of a larger project and there are several other aspects for exploration. For example, in addition to group discussions and structured opportunities for shared reflection, several mechanisms to facilitate individual reflection are found in the literature such as the use of diaries, journals and self-evaluation processes (Bish & Dick, 1992). The use of reflective journals as a source of both inspiration and information to support the scholarship of teaching will be more encouraged in future transdisciplinary action learning sets.

Ramsden *et al* (1995) should be pleased to note that teaching portfolios are now also recognised as a means of documenting evidence of teaching improvements. Teaching portfolios traditionally contain a list of teaching, development and research experiences together with evidence to support claims. The inclusion of self-reflection on issues of particular importance are now valued for performance appraisal in much the same way as feedback from other stakeholders. In association with the action learning outcomes, future educational design initiatives will invite staff to document the reflections and outcomes of their assessment design as evidence in support of their claims for continuous improvement to be included within their own teaching portfolios. These artefacts can also readily serve as stimuli for scholarly investigation and as the basis for their publication on reflective practice.

Other mechanisms for group reflections that might also be explored in the transdisciplinary context include the appointment of process observers within the group who provide useful information to other members of the group to trigger deeper reflections, and the establishment of mentoring relationships where mutual reflections are intended to benefit both parties. Future staff development initiatives will build upon the use of structured space for critical reflection as reported here, and promote a transdisciplinary model of collaborative educational design.

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