Co-operative task design and delivery: Moving staff and students

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ABSTRACT

This paper is concerned with curriculum renewal in departments at a South African higher education and training institution with a career orientated focus. The driving forces for curriculum change derive, firstly, from government documentation which itself draws on aspects of the need for new knowledge workers in industry described by Gibbons et al in 1994. The features of such workers would be their ability to apply transdisciplinary knowledge in flexible ways to solve problems. Secondly, there is a need to retain students in the system and to help scaffold their learning through providing a workplace focus and fostering learning to learn skills. In an attempt to meet these needs co-operative staff groups were set up to design interdisciplinary, work-related tasks with associated explanatory and guiding criteria. In observing and talking to staff developing these tasks, difficulties were detected in working co-operatively, moving from evaluative to learner-support criteria, integration and allowing for more learner-centred control in assessment.

CONTEXTUAL BACKGROUND

This paper describes the initial findings of a project to implement integrated, criterion referenced assessment into a South African higher education and training institution with a career orientated focus or as referred to in this paper 'the Institution'. It is a work in progress. The first question that needs to be addressed is 'Why should we change the curriculum?'

Developed society is in a process of changing and the changes are reflected in the institutions, including universities, which make up that society. Post-modern society has a tendency towards pluralism, diversity, volatility, uncertainty of outcomes and transgressivity (Nowotny, Scott and Gibbons, 2001). Previously separate institutions such as science, politics, culture and industry now more readily inter-penetrate one another and even the notion of the 'nation-state' is being eroded both from the top (for example, in the formation of blocs such as the European Union) and from the bottom through diversity (Nowotny *et al*, 2001). In 1994 and again in 2001 Nowotny, Gibbons, *et al* coined the now familiar term 'mode 2' and mode 2 society in an attempt to pin down a move from a more regulated society of separate entities, a mode 1 society, to one in which boundaries were continually being crossed and new knowledge, mode 2 knowledge, was being produced in the context of application (Gibbons, Limpoges, Nowotny, Scott and Trow, 1994; Nowotny *et al*, 2001).

> In mode 1, problems are set and solved in a context governed by the largely academic interests of a specific community. By contrast, mode 2 knowledge is carried out in the context of application. Mode

> 1 is disciplinary while mode 2 is transdisciplinary … mode 1 is hierarchical and tends to preserve its form, while mode 2 is more heterarchial and transient … mode 2 is more socially accountable and reflexive. It includes a wider, more temporary and heterogeneous set of practitioners, collaborating on a problem defined in a specific and localized context (Gibbons *et al*, 1994: 3).

Co-evolving with mode 2 knowledge and society are scientific and technological developments, for example, advances in telecommunications, which both enable and are enabled by mode 2 knowledge production (Nowotny *et al*, 2001:33).

Stromquist and Monkman (2000) and Gibbons (1998) suggest that universities will have to become different sorts of places in response to globalising influences. Firstly, there is an imperative to form alliances with industry in research projects so as to better serve the need for knowledge development for economic advantage. Secondly, there are changes in undergraduate courses which begin to reflect the sorts of integrated knowledge and qualities needed in new, highly competitive workplaces.

Gibbons (1998: 40) had this to say on the subject of new curricula:

> New curricula can no longer be intellectually driven to the extent they have been. To the intellectual content now needs to be added suitability for purpose … in problem solving, in interpersonal communications and learning how to learn …

In South Africa over the last six years there have been pushes from government to change the current approach to higher education. Broadly, this has involved a change from subject teaching towards subject orientated goals, to more marketable programme teaching towards more workplace orientated goals. This shift was initially signalled in the National Commission on Higher Education Report of 1993, and later in the Education White Paper 3 of 1997 and the National Plan for Higher Education in 2001. Muller and Subotzky (2001) claim that much of the focus for change in higher education was influenced by the work of Gibbons *et al* with the publication of their book *The New Production of Knowledge* in 1994.

CURRICULUM RESPONSES

The Institution is a medium sized (approximately 9 000 students), career focused higher education institution situated in the lower middle class/working class areas of the Western Cape. It offers degree courses predominantly in engineering, applied sciences and business studies.

In 2001, as part of a curriculum development process, the Institution embarked on an ambitious project to change approaches to assessment. Traditional assessment practices at the Institution have been predominantly summative (pass/fail), subject-based and tacit. The re-curriculation process has involved a shift to more formative (guiding towards attainment), transdisciplinary (across subjects and including critical outcomes) and transparent (open to learners' scrutiny) assessment practices. These shifts were derived from national (South African Qualifications Authority [SAQA] 2000) and international (Coates, 2001) trends in changing assessment practices. The approach to assessment taken by the Institution can be summed up as 'integrated assessment'. This is assessment which:

- cuts across discipline boundaries by including the critical cross-field outcomes and sections of other subjects
- simulates complex occupational roles. In other words it reflects the sorts of problems students would be expected to deal with in the workplace.
- can be broken down into a number of smaller sub-tasks which may be discipline–bound. However, the important factor is not whether or not students can successfully perform each of the discipline-based

assessments but whether they can integrate their knowledge in performing the integrated assessment. To some extent the sub-assessments will be formative towards the achievement of the larger, integrated assessment.

- is criterion referenced. This means that what counts as an acceptable response to the assessment, the assessment criteria, are described and handed over to the learners before they do the assessment.

This shift is of importance to the Institution for two reasons. Firstly, it wishes to develop in its students the ability to assess their own performance and to monitor their progress. The development of this ability - which is an important aspect of 'life-long learning' - is an educational aim of the Institution. It is also an aim of other higher education institutions across the world. According to Tight (1996) the ideal of life-long learning was adopted as a master concept by UNESCO in 1970. Secondly, there is the wish to make assessment tasks more authentic in terms of what learners will be expected to do in the world as they progress through the institution. This is in line with Gibbons' theory of mode 2 knowledge production outlined in a paper delivered at the UNESCO World Conference (Gibbons, 1998).

The assessment task was at the level of a project or an assignment typically given after a significant block of teaching. In writing criteria lecturers had to state up-front what counted as knowledge in both the discipline and in the workplace. And where they were talking about the workplace they had to work co-operatively as no one subject could cover a workplace problem. The criteria were co-operatively planned in workshops, then graded. By grading it is meant that the difference between a pass, good, and fail for a particular criterion had to be described in student-accessible terms. The criteria had to include the critical cross-field outcomes (similar to Britain's key and Australia's Mayer competencies).

WORK IN THE DIFFERENT DEPARTMENTS

The data was collected on tape by the authors during staff planning and debriefing sessions on the integrated tasks and in interviews with students about their understanding and ability to work with criteria. These texts were transcribed and segments selected which underlined the main processes emerging. The tasks were: *Design a parking lot on the campus* (Civil Engineering, Year Three), *Design a steam plant to produce electricity* (Mechanical Engineering, Year One), *Design a display/advert for 'Lenin' sunglasses* (Graphic Design, Year Three), and *Design a low cost house suitable for a family of 6* (Building, Year One). The primary role of the data collection was to help us guide staff in co-operative task development. The data we collected on the integrated tasks seemed to sit, broadly, at some point on each of the following four trajectories.

We located two axes of description for co-operation in task design and delivery. The first is that of staff and their willingness and perceived ability to work co-operatively with one another. This is a necessary movement from individual more subject orientated platforms to new shared and co-operative platforms (Gibbons, 1998). The second is that of staff and student co-operation in which staff members are prepared, and students ready, to pass some of the control for assessment to their students.

Staff individual subject to more co-operative platforms

Many departments, at least where issues around teaching and learning occur, are individually orientated. Individual staff report on what they are doing in the classroom to a senior lecturer/manager. Staff meetings focus primarily on operational issues, such as student pass rates and problems, staff development, teaching loads, and so on.

In working on the integrated tasks co-operatively many staff were clearly uneasy with one another. One group continuously referred to one another in formal mode by their surnames, though they had been

colleagues for two years or more. In another group staff believed that collaboration could expose them to critique:

> They do not want other staff to know how they do it (teach), that this is mine, the subject. They do not want to talk about teaching and learning so that others get the impression they don't know what they are doing. They make it clear they do not want to be interrupted in the classroom.

In general staff had difficulties with sustaining group planning. As one group member expressed it:

> I think initially we started off with great intentions of meeting on a regular basis but as the semester progressed, due to whatever reasons, time constraints, we eventually went off to an individual sort of subject approach.

This approach contrasts strongly with, for example, institutions like Alverno College (Jenkins, 2000) where staff work co-operatively on curriculum tasks in interdisciplinary teams, often at set times each week. The whole notion of interdisciplinarity is embedded as part of the ethos of the institution; such teamwork seemed to be 'part of the job' with clear endpoints, rather than something separate which was foisted onto them.

Reflection/ learning orientated ➔ *Endpoint competency/evaluation orientated*

In this trajectory we looked predominately at how the task was assessed. Where learners were involved significantly in assessing their work against meaningful and rich criteria, which often involved benchmarking and the inclusion of critical cross-field outcomes such as problem solving and infolit, the task would fall to the left of the trajectory. Competency referred here to the learners 'getting it right' according to more 'bare' technical criteria, often related to industrial standards. On the competency side the criteria were more a means to test if learners had got it right than to guide them in their learning.

Criterion referenced assessment was seen predominately as an assessor tool. Comments such as 'learners need to use the criteria to get it right' and 'if they make a balls-up they can't come crying to me' supported the use of criteria as an evaluative tool. The criteria tended to include lists of task-related competencies rather than more cognitive skills such as reflection, problem solving, systemic thinking, and so on. In general lecturers had great difficulty with explanatory criteria which could be used by students to direct their own learning.

Where staff groups did attempt to come up with explanatory criteria students often found them too vague or complicated; Carlson *et al* (2000) working on using criteria in Australian universities experienced similar problems with student understanding but got around the problem by providing learners with exemplars of the criteria in texts.

Predominately subject organized ➔ *predominately workplace problem organized*

This trajectory referred primarily to how the task was designed and what its relationship was to the subjects. Where subjects were the primary organisers then the task was probably more interdisciplinary in nature and more transdisciplinary where the problem was the organiser.

In all the tasks it was found that lecturers were concerned with the inclusion of as much subject knowledge as possible; the question raised in meetings was often 'have we got enough maths/drawing in the project?' In one instance we were told outright that the project 'would not be done in industry'. What was important for the lecturers was that the task taught underlying reasoning necessary to operate in that field. The task was predominately a teaching tool rather than a real/simulated complex industrial problem.

One area with which we struggled was to get the lecturers to see the project as an integrated whole. They were generally quite adamant that the final product from the student would be marked in subject sections according to their different areas of expertise. As one lecturer put it 'it is years since I last studied design and I would not know how to assess it'. If it was to be fully integrated then, as the lecturer below indicates, there could be dire consequences:

(Task: *Design a steam plant for a particular purpose and output*)

Derek: …. how a lecture when they sit down. I don't know what is taught in design. I left it 20 years ago and I kind of work intuitively now. I can't tell what a student has heard in a classroom or a lecturer has taught that student in the class. So I can't assess them against what they've heard in the classroom. So specific information like the thermodynamics in the motor, how will that be assessed?

Cecilia: That will have to be assessed by the sub-task (subject task) which is very thermodynamics-specific, that's my sense.

Derek: But what about all the other groups that are not being assessed by Oscar (the thermodynamics lecturer)?

Cecilia: Oscar will simply assess, for example, the group he has been mentoring and somebody else will assess another group. So any lecturer involved in an integrated project will assess two or three reports.

Derek: How will they assess?

Leon: That's the whole reason we are coming up with these three columns, to say that you and you and you and you assess communications, assess design principles, assess argument and assess that so when you look at it you don't go 'I am fluids, cheerio to thermodynamics, cheerio to the design…'

Derek: I am questioning how that will be achieved.

Keith: Well, you will have to have correct criteria for different pieces.

Derek: If you just don't know about the thermodynamics of a boiler.

Leon: Well you've got, I mean, there is no way a student is going to know more than you do. I am serious. So what the student puts in his report is not going to fly straight over your head. It should be well within anyone in this meetings grasp to see, if they say the aeroplane weighs 300 tonnes and has a lift of two Km you know they are talking rubbish, and don't know what they are on about. So, like I say, I don't think the students are going to put anything in their report which is going to be beyond any of our …

Cecilia: Every, every lecturer at S3 (year two, second semester) level should know how and where his particular subject area fits into this project.

Derek: I just get a sense you are going to get a watered down, um, practical, um, project, that is going to end up being a communications exercise which might as well be assessed by the communications lecturer.

Leon: *There's 'die klip in die bosse'!* (There's the cat amongst the pigeons!)

The first thing this transcript tells us is that boundary crossing between subjects is not easy. There is a real sense of others having expertise for which they alone should be responsible, and that crossing boundaries and transgressing on others' subject areas is necessarily a dangerous thing (one could, for example, misread or fail to understand the subject). The result of transgression across subject boundaries is likely to be a sort of contentless object which has little importance in the field of engineering training. There seems to be a difficulty with recognizing that the object, the problem or task at hand, demands the reconfiguration of the subjects in new ways so that they form a new whole around the integrated task.

This leaves the question of how to push for collaborative work and knowledge reconfiguration amongst our staff where there is an entry-price to this new domain; it costs and it hurts, and the product may be integrated into nothingness.

Lecturer directed ➔ criterion directed

This trajectory involved the locus of control over what was counted as acceptable in the project. Firstly, it involved the extent to which learners were to be allowed to 'take control' of their own learning, via self and peer assessment against criteria.

The following report from a member of the curriculum development team, who was attempting to organise a session in which learners worked with a set of criteria on their first draft of an integrated task, is illuminating in illustrating difficulties with control.

> I started to go through the criteria and the sub-criteria, pointing out where learners should fill in their comments. At this point the lecturer said, 'OK, enough of this' and pointed to a student in the back row and asked, 'You! What's your name? Have you got a draft? Why not? Who are you working with? Well go and sit next to him?' About half the students gathered around the lecturer who started telling them what they must do in their assignments, asking them if doing such and such was good enough and why not. He started telling them about a good introduction (which was not in the criteria) … the lecturer was happily taking on this role as supervisor rather than using the criteria.

The narrative serves to illustrate a problem with such projects which both cross subject boundaries and move responsibility for assessment to learners – they are just too volatile and uncontrollable. It is also, seemingly, difficult for learners to take over the mantle of control for the project by relying on interpreting the criteria.

Yet we find that at least in some knowledge areas, such as graphic design, peer evaluation may be essential as part of a fuller assessment. In interviewing graphics students on 7/8/2002 the conversation essentially described the difficulty students had in being marked by their graphics lecturers. The lecturers could, broadly, say whether or not someone was technically competent but could not necessarily make a value judgement between good and excellent. At first students avoided trying to pin this quality down, by saying that some people are just 'good' or 'creative'. But we found that there was a way of adjudging work and that was to put it to fellow students and ask them to adjudge. They felt that these students were of a more appropriate age group for the products they were designing and were less contained by what the students saw as 'hidden' academic standards.

A MODEL FOR CURRICULUM

We will continue with our integrated task initiative, and engage at least some of our lecturers in reflective development cycles, aimed at further task development. However, we are well aware of the dangers of radical integration before learners have grasped the essentials of subject knowledge needed to solve problems and implement procedures, as pointed out by Muller (Muller and Subotzky, section 2, 2001). Thus integrated work needs to be preceded by, and matched by, parallel subject task work.

If such integrated tasks are workplace orientated, then they can begin to apprentice learners to the sorts of complex knowledge application 'likely to be encountered in real life', as well as provide a coherent rationale for studying the separate subjects, particularly for those first year students most vulnerable to failure.

The essential base to such integrated tasks is co-operative work by lecturers. It is only through co-operative work that lecturers can begin to share what they do in their separate subjects and come up with representative criteria that they all understand and in which they have confidence. Importantly, such criteria would go some way to allowing lecturers to relinquish control of assessment to learners. In this way it is hoped that lecturers will be able to focus their subject teaching towards some real-life endpoint and be themselves able to assess the whole project. As pointed out earlier, it is through the use of such criteria that we hope to develop in students the ability to 'learn how to learn'.

Co-operative assessment design from staff requires that this work is prioritised by departments and the institution, and that regular time is set aside for it (Jenkins, 2000), a problem we have not managed to resolve in our institution. It also requires a commitment on the part of staff to self-reflection, review and quality (Smith *et al*, 1997), qualities which require time to develop and leadership and rationale from curriculum developers. On the other side of the coin, we also need to train students on how to cope with such curricula, a process we are just beginning to explore.

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