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Shamanism and Science: Curriculum as reciprocal and transformative

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Abstract

This paper examines how students' resources can be drawn on in curriculum design in tertiary education to develop a pedagogy of diversity. It asks what kinds of resources are privileged through existing academic practices, and how certain traditionally unused resources can be included in teaching, learning and meaning-making. Using a case study in engineering in South Africa, an argument is made for a 'reciprocal curriculum', an exchange of cultural practices and not just bridges to established norms. In this conception of curriculum, students' practices and resources can be utilised, whilst the discourses and knowledge of the discipline can also be made accessible. The parameters of 'science' and scientific discourse are explored by analysing students' texts from a multimodal social semiotic perspective. The paper ends by proposing that students' resources be harnessed through using metalanguages to describe and reflect on their own practices as well as on academic practices, and the need to create less regulated spaces in the curriculum in order to enable this reflection.

Key words: *reciprocal curriculum, pedagogy of diversity, multimodality, social semiotics*

Introduction

This paper examines how students' resources can be drawn on in curriculum design in tertiary education. It argues for a 'reciprocal curriculum', a curriculum in which students' own practices and certain traditionally under-utilised resources are drawn on and validated. This involves demystifying academic practices and bringing both students' resources and the resources of the discipline into conscious awareness in order for the students to take greater control over meaning-making processes. Within a reciprocal curriculum, I argue for the importance of a multimodal approach to pedagogy, where the limits of the written and spoken modes for representing experience are recognised, and multiple forms of representation are encouraged (Kress and Van Leeuwen 1996, Stein 2000). The research was designed to answer three questions, namely what are the representational resources of students from diverse socio-cultural backgrounds entering the academy, how students use these resources in producing a number of unregulated and more regulated genres, and how we can draw on students' resources in curriculum design. I draw on data generated from a Communication Course in an engineering foundation programme at a South African university in order to exemplify what a reciprocal curriculum could entail. However, the arguments for transformation are relevant across disciplines and within the global Higher Education context. They are also not restricted to 'foundation' or

‘communication’ courses, although naturally certain courses are more conducive to this kind of approach than others.

The predominant paradigm in education in South African universities is ‘outcomes-based education’ (OBE). Although the philosophy of OBE is that of an explicit pedagogy intent on demystifying academic practices and widening access, it often translates differently in practice. Critics of OBE argue that in the South African context OBE tends to become a transmission pedagogy as the grounds for its inception were primarily political, rather than educational (Skinner 1999; Jansen and Christie 1999). A transmission pedagogy is positivistic in nature and threatens to atomise and compartmentalise curriculum knowledge into distinct units. According to Jansen,

by organising knowledge around discrete competencies, OBE overlooks the important cross-curricular and interdisciplinary demands encountered in learning a complex task. It further assumes that knowledge acquisition proceeds in a linear way such that one outcome is linked in a step-wise direction to another (1999: 152).

In contrast to this kind of transmission pedagogy, the reciprocal curriculum, which I propose, encompasses a transformative notion of pedagogy which emphasises the agency of the subject. According to Fairclough,

subjects are ideologically positioned, but they are also capable of acting creatively to make their own connections between the diverse practices and ideologies to which they are exposed and to restructure positioning practices and structures (1992: 91).

This view of practices as transformative has implications for equity. The pedagogical focus falls on student interest in the use of particular forms, rather than on inadequacy and ‘lack’. Transformation encompasses validating the resources from previously disadvantaged groups in society. These resources include indigenous languages, local knowledges, personal experience and multimodal competencies.

Questioning boundaries between domains

In South Africa, resources like local languages and certain kinds of indigenous knowledge tended to be under-valued under the previous political dispensation. There was a general ethos of boundary-making with an attempt to police a multitude of these boundaries. The following narrative from an interview with one of the first year engineering students reveals some of the tensions between insider and outsider knowledge in a particular domain, and raises questions around ‘scientific’ knowledge.

In Venda happened a crucial story. They also put it in *The Sowetan* newspaper. Actually the woman had meat ... she bought this meat from some guy. She put the meat on a tray so it can get dry. So during the night the meat is burning. It was just making a colour, glowing ... but people were able to see it. So, they even called some people there. I don’t know what to call them, scientists or whatever, but people who can say what is happening about it. And these people came there with that – I can say – ‘technology’ and the scientists said the cattle was having a certain kind of a sickness, a disease. But Africans know that it was not. The thing is, ah, the cattle was stolen cattle.

Here the insiders claim that the meat was stolen, and that the ‘glowing’ is a reflection of some kind of societal misconduct. However, the outsiders, scientists, surmise that something is wrong with the meat. This extract illustrates Bernstein’s (1996) point

that power is often maintained and relayed through the creation of boundaries between practices. In order to explain the phenomenon of the ‘glowing meat’, an opposition is established between ‘scientists’ from outside the community and the ‘people’, between ‘technology’ and local knowledge. Because boundaries demarcate and protect what is valued, they act as insulations with regard to the ‘purity’ and ‘mixing’ of categories and discourses.

Observing the world from a Western ‘scientific’ perspective can seduce us into believing that it is not a perspective at all, but simply an unmediated encounter with the universe as it really is. A positivistic view of scientific knowledge is as “cumulative, linear progression from ignorance to knowledge, as steady and inexorable movement away from incompleteness and error” (Kneebone 2002: 516). Loosely defined, ‘science’ is a way of seeing relations between elements in the natural world. Science is both a method of empirical investigation of knowledge, and what has been canonised and naturalised as ‘truth’. This way of viewing the natural world in Western empiricist traditions is in sharp contrast to practices labelled as ‘shamanism’ or magic, where the symbolic, cultural and physical are less overtly separated.

However, we need a closer analysis of academic practices and institutions to see the way in which relations of domination are achieved and maintained. According to Foucault, ‘any system of education is a political way of maintaining or modifying the appropriation of discourses, along with the knowledges and powers which they carry’ (1970: 64). It is important to realise that Western science is a ‘specific way of *thinking* locally ... one among many local knowledge systems’ (Gough 2003 quoted in Weber 2005). We need to ‘anthropologize the West: show how exotic its constitution of reality has been; emphasize those domains most taken for granted as universal ... show how their claims to truth are linked to social practices’ (Rainbow 1986 in Hallam and Street 2000: 4). Where practices have been naturalised as ‘common sense’, the meaning produced will be more reproductive, thereby reinstating dominant forms.

Currently we are in a period of flux and transition with boundaries between practices being debated, such as the boundaries between academic disciplines and domains of knowledge. This loosening up of academic boundaries is a global phenomenon. According to Luke,

disciplinary and institutional boundaries between science and humanities, between the ‘hard’ natural sciences and ‘soft’ human sciences, between the public discourses of science and domains of folk wisdom have become the focus of unprecedented scrutiny (Luke in Halliday and Martin 1993: xi).

There has been a general shift in the professional disciplines towards the subjective and the affective, and acknowledgement that engineering is a social activity with political, ethical and economic dimensions. This has resulted in a trend to create a balance between technical and non-technical aspects in engineering curricula designs worldwide (Wulf 2004; Horack 2003; Bugliarello 1991). According to Beder, there is ‘an increasing need for engineers to choose technological solutions that are appropriate to their social context and to give consideration to the long-term impacts of their work’ (1999: 13). The broadening of engineering to include the humanities and the related social sciences is echoed in other professional disciplines, particularly

in medical education with bodies such as the Association for Medical Humanities being formed to co-ordinate research and teaching activities in medical education (Evans 2002; Kneebone 2002; Charon 2001).

Perhaps the kind of reciprocity envisaged in a reciprocal curriculum tends to happen more organically in a humanities environment where students are encouraged to reflect on their personal and societal practices. In many first year science and engineering courses, knowledge tends to be atomised into subjects like maths and physics which are not always applied directly to real world contexts. A curriculum which utilises students' practices and resources is invaluable in these contexts, as students are given an opportunity to interrogate their past situations, as well as their future aspirations. They may also start to think critically of their prospective professions within the particular socioeconomic contexts they find themselves in. I will describe the Communication Course in engineering in some detail, as an exemplar of what a reciprocal curriculum might comprise.

Communication Course in Engineering as reciprocal

The Communication Course is based in an engineering foundation programme at a South African university. The foundation programme is aimed at students from economically and educationally disadvantaged backgrounds. It involves more intensive teaching at a slower pace than the 'mainstream' curriculum and includes additional courses which focus on developing 'academic literacies'. The Communication Course is one such course which aims to ensure that under-prepared students who have been admitted to the university have a fair chance of success. The curriculum design, therefore, has to take the students' backgrounds and schooling into consideration, as well as the new discourses and discourse communities they encounter in the tertiary environment. In order to achieve this, the course focuses on sustainable development in impoverished rural areas in South Africa and it attempts to draw on students' experience of underdevelopment as a form of 'situated practice' (New London Group 2000). The course is designed to harness diversity as a classroom resource, particularly the rural / urban divide and class divisions which are a major source of difference in a developing country like South Africa. The rural focus is one way of engaging with, legitimating and giving authority to the experiences of students from rural areas and informal settlements, which are often the poorest areas in South Africa.

The curriculum is designed around a particular research project to which all of the communication tasks relate, including an argumentative essay, needs analysis, investigative report, poster, and oral presentation. In teams of four, students investigate the infrastructural and developmental needs of an existing rural settlement in South Africa. In the project, students have to assume multiple roles, including learners, professional consultants, engineers, and researchers. Expert-novice relations are established between the rural students who know the chosen area and those who do not. Within each team, individual students research one aspect of rural development (including transport, housing, power, water and sanitation) and share it with the other group members. The premise underlying these expert-novice relations is Lave and Wenger's argument that learning is not located in the acquisition of structure, but in the increased access of learners to participating roles in expert performances (1991: 17). Multilingual, multicultural, mixed gender classrooms such as those which comprise the Communication Course, provide an ideal environment in

which students can test their own readings and interpretations of texts and situations against those of others.

The rural development focus also emphasises the importance of drawing on local knowledges and experiences in order to explore other possible ways of thinking about human-nature interactions. With the strong force of globalisation, it is necessary to look forward in the twenty-first century, whilst at the same time examining how people draw on rooted experiences, and how they negotiate sometimes complex spaces. This is not to imply that using knowledge of the past as a resource is a simplistic process of ‘going backwards’ or ‘learning lessons’. Rather, we need to critically analyse the way we produce knowledge about the past, and how that knowledge is used in today’s debates. Head asks: ‘How might we think differently about people, nature, environmental change and the past if we ... give voice to indigenous and local understandings?’ (2000: 9). New competencies do not mean forgetting indigenous life worlds. Theorists in the field of indigenous knowledge, like Nakata (2001), Goduka (2005) and Weber (2005), have written about the challenge for curriculum – how to acknowledge indigenous experience and expand on it. For instance, Weber (2005) explores how Higher Education in Africa can benefit from the study of locally produced knowledge through the use of life and oral histories. However, simply making curriculum more ‘relevant’ to particular communities need not be necessarily be transformative. Teaching and learning should always be about extending human development and potential, about “moving students from the known to the new, about elaborating and extending existing cultural schemata and scripts, constructing and inventing new knowledge, new cultural practices and novel applications of existing ones” (Luke 2009: 18). In thinking about rural development in the Communication Course, students need to think about marrying their knowledge as engineers with local people’s wisdom and needs, acknowledging this as a mutual process, not a top-down process.

The course thus emphasises drawing on cultural resources, looking at existing systems that work, and enhancing and complementing these. It also envisages curriculum as a two-way exchange of resources rather than uni-directional transmission. This implies that staff should learn from students, just as students learn from staff. In a reciprocal curriculum the discourse and knowledge of the discipline are made available, whilst students’ practices, resources and discourses are simultaneously utilised and validated. This is different to a ‘responsive’ or ‘inclusive’ curriculum which is constructed to start from where the students are and move on from there. Gee (1996) talks of a move from an ordinary, life world language to an academic specialist language, and the attendant changes of identity in shifting from one community of practice to another. Many ‘academic literacy’ or ‘foundation’ courses are designed on this basis, beginning with experiential knowledge and ‘progressing’ to more abstract knowledge. The assumption is that writing about one’s own experience can provide a pathway into academic writing. In Luke’s words, here “the recognition of difference in learner habitus is seen as a means towards conventional achievement as determined by existing rules of the field” (2009: 13). This ‘pathway’ or ‘stepping stone’ notion of curriculum is a problematic view of induction into academic practices that encompasses a linear sense of development, a subtractive rather than an additive view, a ‘leaving behind’ in order to ‘move forward’.

I will now give two examples from the Communication Course to exemplify how the projects are not simply springboards for students in a linear conception of curriculum, but are a serious interrogation of students' resources. The first example involves the examination and utilisation of students' primary and alternate secondary discourses in the construction of 'science' and academia. The analysis focuses on a student produced poster and one of the accompanying written reflections. The second example looks at the use of local lexis from students' primary discourses within the technical domain of the discipline. It focuses on five students' written reports. I analyse the above texts using a multimodal social semiotic approach (Jewitt and Oyama 2001, Kress and Van Leeuwen 1996, Stein 2000). This approach focuses on the relationship between texts, social contexts and the social practices they realise. In the act of making meaning "learners produce multiple signs in textual forms across semiotic modes, drawing on different representational resources in order to succeed in that domain" (Stein 2000: 333).

Scientific discourse: representing relations between elements in the natural world

The Communication Course begins with a project in which students think about everyday objects that have symbolic meanings in their communities. The rationale behind the 'Symbolic Object' project is to use material artefacts to elicit indirect accounts of personal experience, to engage with notions of cultural practice and cultural change in the classroom and feed this awareness into development studies (see Archer 2007 and 2008 for a fuller account of this project). The students need to produce a text explaining the functional and symbolic meanings of the objects, using any medium of production and any ensemble of modes. Many chose the poster as the medium of production, whilst others produced three dimensional models made from a variety of materials, such as cardboard, wire, beer cans, or paper maché. The aim of the Symbolic Object project is to create a 'less regulated space' in the classroom where formal assessment is de-emphasised in order to enable students' resources to emerge and also to create an opportunity for reflection on their home practices and different ways of viewing these practices, as well as concepts around 'development' in different sociocultural contexts.

One group of students produced a poster depicting the slaughtering of a goat and described the significance of that highly valued and codified practice in their community (see figure 1). Slaughtering a goat enacts a range of societal and spiritual functions. It can be a way of communicating with ancestors and can perform a 'purification' function.

Two types of analytical hierarchies operate in this representation. The first hierarchy shows steps in a process, the second shows the division of the whole into parts. The image is about the way these parts fit together to make up the larger whole. The 'whole' is both the goat alive and intact, but also the 'ritual of goat slaughtering' in its entirety. I will say more now about these ways of organising knowledge in the text.

Process and transformation

Scientific discourse is realised through the processes in the image. This poster represents actions which necessarily have taken place over time with the goat represented as alive, followed by its slaughter and dissection into parts, and finally its fate in the cooking pot. The representation of the goat has syntagmatic logic, in other words, it describes the sequence of and the connection between elements. This is a feature of scientific discourse, but, according to Douglas (1966: 64), syntagmatic meaning is also a feature of ritual practices in which events occur in regular sequences and acquire a meaning in relation to others in the sequence. Without the full sequence, individual elements become lost.

There is a tightly framed 'before' and 'after' structure and the poster is organised both along vertical and the horizontal axes. This framing is realised through a strong vertical frame line which divides the poster into two equal squares with a boxed textual explanation on the left and three steps in the slaughtering process on the right. The steps are represented by three circular shapes: two of the traditional 'kraal' as the scene of action, and one of the rounded three-legged pot. The circles reinforce the notion of cycles, rituals and repetitions, and draw on the idea of circles as the 'traditional symbol of eternity and the heavens' (Thompson and Davenport 1982 in Kress and Van Leeuwen 1996: 52). The directionality of the goat on the left is important here, because it points towards the 'action' on the right, the message. The 'given' or known information is the goat alive and intact in its 'naturalistic' setting. The 'new' information is presented on the right as the stages of slaughtering which are ordered along the vertical axis.

In this representation, there is movement from or transformation of one thing into another. The written text begins by talking about 'a' goat: 'three men in a kraal assisting each other with the slaughtering of a goat'. Once the goat is slaughtered it is referred to as 'the' goat. Thus the transformation from generic goat to the specifics of the goat as sign within the particular cultural practice is reflected in the reference system in language, as well as in the visual representation. The diagram of the goat represents change as movement from one thing into another; change from the physical to the spiritual and the whole into its parts.

Part-whole relationships

The scientific discourse of the goat poster is realised through the relation between the participants in the image. The different parts of the image have the roles of 'carrier' and 'possessive attributes' – the parts that make up the whole. The goat functions as the 'carrier' and the internal organs function as 'possessive attributes' (see figure 2 below).

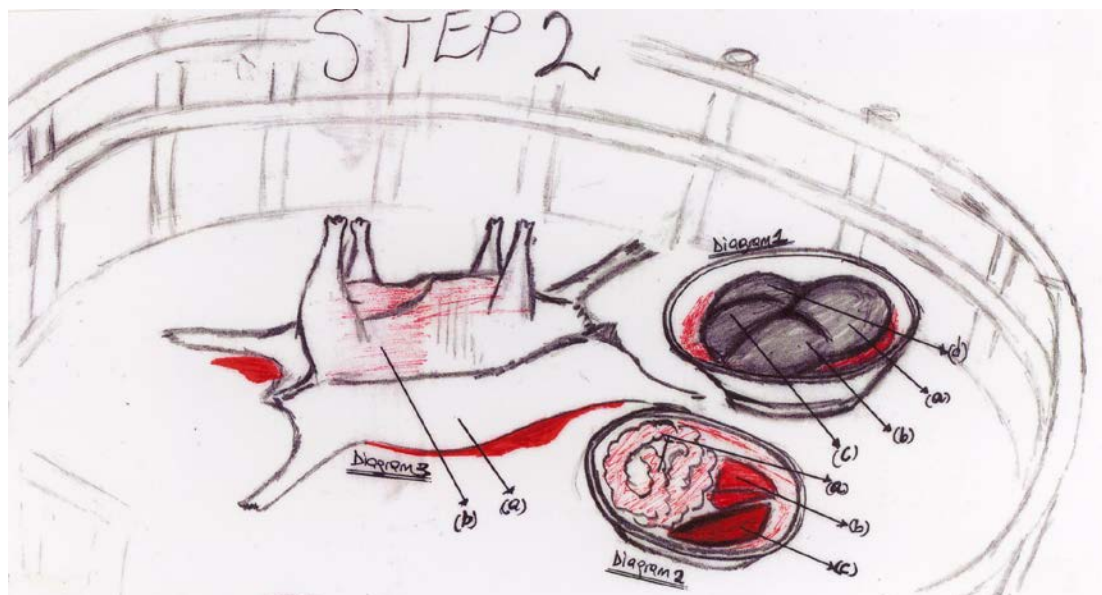


Figure 2: The division of the internal organs of the goat.

According to Kress and Van Leeuwen, the closest linguistic analogy for this type of analytical picture is the ‘possessive attributive clause’ (1996: 49). So, the ‘statement’ of this image is something like: “The ritual of slaughtering a goat *consists of* first slitting the goat’s throat, then dividing the internal organs, then cooking the goat.” The emphasis on the ‘possessive attributes’ in the image is echoed in one of the student’s written reflection:

The poster with drawings has been chosen because it allows for many exposures that can be made on the selected portfolio. The most important of all are the *internal organs* of this animal. The way they are laid after they have been removed from the animal’s body, the names of different parts of the goat stomach, as well as the place in which the goat is to be slaughtered. (student’s written reflection, emphasis mine)

In this extract it is clear that the students’ emphasis on the possessive attributes in the image (the ‘internal organs’ and the ‘different parts of the goat stomach’) echo the importance of these attributes within the practice itself. The representation and reflection thereon also show insight into the affordances of the visual mode. The visual is uniquely placed to display the whole and its parts – the whole goat and how it is broken down. The visual displays all at the same time, unlike the sequencing possible within written text.

Although the process of slaughtering is depicted over time, the analytical nature of the poster (in terms of ‘carrier’ and ‘possessive attributes’) creates an impression of temporal stability, timelessness and an idealisation of traditions. Through emphasising the ‘possessives’, the participants and their actions are presented in a static order and the process becomes reified. Thus, the visual representation here is able to blur the boundaries between the dynamic and the static; the process and the display.

I will now move on to the second example, namely the use of local lexis from students’ primary discourses.

Use of local lexis in the technical domain

A reciprocal curriculum is not about innovation only, nor is it about uncritically perpetuating the status quo. Rather, it is based on the premise that the tension between convention and a dynamic for constant change is the norm and is the effect of the “constantly transformative action of people acting in ever changing circumstances” (Kress 2003: 108). Students’ textual productions often represent a negotiation between the institutional demands and the students’ interests and competencies. In other words, textual representations are shaped both by students’ understanding of the specific socio-discursive context and by what they bring to the act of representation.

An interesting case in point here is the incisive use of local lexis in the domain of engineering. Students on the Communication Course investigate the upgrading of a particular rural settlement in terms of water and sanitation, power, transportation, environment and housing. Each student is required to write an individual research report on one of these aspects. Often in these reports, student interest motivates the choice of lexis, the taking of a discursive position. For instance, the local term for a hot dry wind blowing from the mountainous area to the coast is ‘berg wind’ and one student uses the term both descriptively and technically in her written report assignment. In the first extract, the term ‘berg wind’ loosely denotes wind in general. In the second, it is used in a precise technical way, where the warmth of the air is identified as the defining feature of the ‘berg wind’.

Ingogo is just beyond the Drakensberg mountains near Newcastle and has heavy summer rainfalls and berg winds which are advantageous for the construction of wind mills and wind pumps.

It is associated with berg winds and as a result experiences orographic rainfalls (rain caused by the ascending of warm air).

The word ‘veldfire’ also appears in one of the written reports. Here, the term ‘veldfire’ signifies a very specific kind of fire – widespread, difficult to extinguish, destructive of large tracts of land rather than settlements. This writing reflects on the local orientation and thus uses local lexis.

We will also try to replace those wooden poles used to support power lines with the concreted ones in order to withstand veldfire.

Another local term commonly used by the students is ‘donga’ as in the following sentence: ‘Transportation is not an easy thing to do because roads are full of dongas and during rain they are muddy’. ‘Donga’ is a South African word referring to the formation of a ditch as the result of soil erosion and the lexical choice here reflects on the local context. The term ‘donga’ could be seen as a technical term in this context. Here the student uses the word donga as a noun, but he also uses it as an adjective elsewhere in the report: ‘prevention of donga erosions during rains’. Another student uses the term ‘donga’ in a similar way to the first:

The big problem is that the soil does not have enough vegetation, which anchors it to help prevent soil erosion. This results in dongas which create obstacles on the available pathways.

A third student, however, talks of ‘furrows’ instead of dongas: ‘This degradation of the land by water resulted in some huge furrows being formed between the houses’ and a fourth talks of ‘hollow roads’: ‘Gravel hollow roads usually damage cars’. The terms ‘furrows’ and ‘hollow roads’, although more conventionally scientific words,

are both less precise than the local term 'donga' which functions as a more 'technical' word in this context.

I have argued that in order to set up a reciprocal curriculum, one needs to interrogate students' representational resources, to describe how indigenous ways of thinking and representation are similar to and differ from those in Western engineering, in order to look at what could or should be preserved. 'Scientific' forms of reasoning from students' life worlds (exemplified by the goat poster) should be drawn on, as well as, for example, local lexis used incisively in the scientific domain. The local terms (berg wind, veldfire, donga) are not terms used in the curriculum, but the students chose them and used them appropriately to actualise scientific academic discourse and to point to precise shared meanings. Both of these examples point to 'mixed' forms of categories, genres and discourses. These examples illustrate how, when different representational resources encounter a range of genres and forms, these forms are often recreated. 'Breaking' or reinterpreting some standard generic conventions here signals an encounter of diverse knowledges and differently organised social worlds.

Although a reciprocal curriculum is about cultural exchange, complete 'equality' of cultural trade is perhaps too ambitious and unrealistic in the educational context. In tertiary education there is a particular configuration of institutional and disciplinary practices that students entering the system need to recognise and negotiate. For instance, through processes such as nominalisation, scientific discourse sets up hierarchies of epistemologies (between everyday and disciplinary knowledge) which can act as a code only interpretable by people 'in the know'. This can create the illusion of privileged knowledge for both hearer and speaker, masking contradictions and imposing an unexamined consensus (Hodge and Kress 1993: 35). Ignoring these discourses and practices does a disservice to this particular group of educationally disadvantaged students in the present South African context. Hence, I have attempted to demonstrate how a reciprocal curriculum needs a dual focus, demystifying academic practices as well as recognising and utilising students' resources.

Modal aspect of transformation

Student resources manifest in different modes and genres as shown in the two examples discussed above. I would like to argue that in theorising pedagogical transformation, the modal aspect is crucial. By this I mean that, depending on the context and the particular students, different modes can enable different kinds of being and knowing. Modal resources are the culturally shaped resources available for representation and include images, spoken language, written language, and gesture. Each discipline develops its own system of representation which then becomes canonised and the functioning of modal resources becomes specific to that domain. In this paper, I am particularly interested in the visual and written modes.

Some students struggle with classifications, comparisons and analytical hierarchies in the written mode and tend to do better with conceptual structures in the visual mode. It seems that the producers of the goat poster were able to represent complex conceptual frameworks in the visual mode with more competence than in the written mode. This is in line with Kress and Van Leeuwen's (1996) argument that there are general shifts in modal functions where the visual mode is becoming increasingly important as a carrier of information in multimodal texts.

It needs to be made clear to students that textual forms are located in specific social and cultural domains which constrain them by valuing specific genres and discursive practices. According to Luke, 'what is needed is a pedagogy which goes far beyond the transmission of genres, and offers social and cultural strategies for analysing and engaging with the conversion of capital in various cultural fields' (1996: 332). As Kress (2003) puts it, our work has changed from an emphasis on competence in use to an emphasis on design. Competence is about adhering to the conventions of the socially powerful. The notion of 'design', however, recognises that there is a proliferation of resources, including multimodal resources, and meaning-making is about choosing and assembling these resources in relation to individual desire as well as perceptions of audience and context.

Moving between modes does not result in complete transformation of an utterance from its realisation in one mode into realisation in another. Rather, the utterance is 'recast within the potentials of the other mode' (Kress 2003: 130). For instance, scientific discourse can be realised both verbally and visually. In the written mode, scientific discourse is realised through lexical choice and particular grammatical constructions such as nominalisation. In the visual mode, scientific discourse is realised through diagrammatic representation, naming and labelling the represented components, and the organisation of information into analytical hierarchies. In both written and visual modes, scientific discourse is realised through degrees of authorial distance from and degrees of engagement with the subject matter.

Often in 'academic literacy' courses the verbal is prioritised over the visual. However, these courses should take cognisance of the different modal realisations of scientific discourse (see Archer, 2006 for a discussion on modal specialisation in scientific discourse). Utilising a range of modes of representation in the curriculum is a way of harnessing students' resources and this range needs to be valued through multimodal assessment practices.

Creating less regulated curriculum spaces

Less regulated spaces need to be created in the curriculum in order to allow student competencies to emerge and to be validated. By less regulated spaces, I mean classroom environments which require open tasks with no strict-specified generic guidelines and also classroom environments which place less emphasis on assessment and more emphasis on creativity and the use of students' own resources. Less regulated curriculum spaces are able to draw on and experiment with a range of genres and modes in a way that is not always possible in highly regulated genres such as the written report.

The Symbolic Object project described earlier was a largely informal and unstructured curriculum task, which created a less regulated space in the Communication Course. The students could choose their own objects for investigation and talk about why certain objects were meaningful to them. In this more open space, students could exchange cultural and personal knowledge, experiment with multimodal representation, draw on 'non-academic' discourses or alternate secondary discourses.

Making students' resources visible

Only resources which are made visible can become available as elements in conscious design processes. A reciprocal curriculum would see the importance of reflecting on the functioning of signs in practice and on communication as interpretation. Students need to be aware of the resources they are drawing on in producing their versions of academic discourse. Let us look at one instance to illustrate. In the assignments that students produce in the Communication Course, the identification with a new role, 'consultant engineer', rather than 'student from a rural area', sometimes invoked a sense of distance from the issues of development, which fed into constructions of the 'other'. In this sense, self and other are mutually constitutive; identification and objectification go hand in hand. The conflict between students' emerging identities as engineers and their previous identities as people from impoverished and under-developed areas is often realised semiotically in the uncertain modality of some of their written texts. By modality I mean the produced shared truth value or credibility of an utterance. An example of this is the use of the modal auxiliary 'can' in the following statement. It seems to indicate an ambiguous relation to authority, as it has two meanings – both 'ability' and 'permission'.

Traditional management systems, an increase in the village population coupled with a free market approach can put an end to some harmful traditional practices. (from a student's written report)

Here 'can' could signify that these factors are 'able to' put an end to traditional practices. 'Can' could also have been used here in place of the more tentative modal 'could'. Highlighting the ideological contradictions around development in the curriculum could be a way of getting students to interrogate their own ideological positions.

I have argued that the conceptual frameworks in the texts produced at the beginning of the year in the less regulated context of the Symbolic Object project could be highlighted and utilised in the curriculum in teaching 'scientific' ways of thinking and representing. For example, the conceptual structure of the goat poster, representing participants in terms of a generalised and more or less stable essence, and the organisation into analytical hierarchies are a conceptual cognitive resource for students to draw on, although the form of these hierarchies may be modally changed in an engineering environment. Students could be alerted to the way in which both the participants and their actions are presented in a static order and the process of slaughtering is reified into a static and timeless state. As argued earlier, this conversion of process into reified objects is comparable to nominalisation in written text, an important feature of scientific discourse which students need to master.

Visibility of resources is also achieved through developing appropriate metalanguages. Metalanguages of 'reflective generalisation that describe the form, content and function of the discourses of practice' (NLG 2000: 34) are important in achieving conscious awareness of the nature of the resources being used. Certain kinds of reflection require different kinds of thinking, drawing on particular lexical and grammatical domains. Finding a legitimate space for reflection is a challenge as it should not be formulaic, another 'hoop' for students to jump through, but carefully structured and based on students' own resources. In the Communication Course, for instance, the students were required to reflect on aspects of

'representation'. They had to write reflections on their poster productions, using a metalanguage of visual design developed on the course.

A metalanguage may feed into the language of criteria for assessment purposes, especially when working in unfamiliar modes. Assessment of multimodal texts is a complex and multilayered task as there is often a greater range of possible designs than is the norm for more 'traditional' texts. Kress et al (2001) say that assessment criteria may be mode-specific, rather than content-specific. Davis and Reed (2003) raise a similar question, namely whether marks should be given for 'execution' of performance. They argue that the demonstration of understanding of a text and understanding of design of that text may not be separable. In the Communication Course, a metalanguage of visual design was used to describe the criteria for assessment and both the content and the visual design of the posters the students produced on the course were assessed.

Final comments

I have argued that a reciprocal curriculum would not attempt to socialise students into dominant academic practices, nor would it naively ignore those practices. Instead it would look at resources holistically, as systems of representation and transformation. This transformative model of pedagogy is additive rather than subtractive, does not see development as linear, and embraces mixed practices. A reciprocal curriculum would thus preserve useful ways of thinking and representing, but at the same time reveal some of what has been naturalised as 'universal' in terms of academic textual practices. It is important to highlight the ways in which these academic practices may serve to exclude individuals from disadvantaged social groups. Discursive practices need to be seen as socio-historically situated and academic discourse seen as a 'privileged' discourse, but also as 'contestable'.

My final word is that there are certain pedagogic rights in a democracy. These include the right to individual enhancement, but also the right to be included socially, intellectually, culturally and personally. However, to be 'included' does not necessarily mean to be absorbed.

As teachers, teacher educators, administrators, curriculum developers, educational bureaucrats and public intellectuals, we have within our grasp the possibilities of setting up fair and equitable rules and procedures for the evidence-based recognition of students' capital, and for establishing enabling conditions via curriculum, pedagogy and assessment for the optimal valuing, exchange and conversion of these complex forms of capital into a normative model of new human subjects: multilingual, transcultural subjects who remain grounded and engaged with their communities and cultures. (Luke 2009: 15)

Central to democracy is the recognition of difference as well as commitment to dialogue across difference. A reciprocal curriculum values a conception of identity that lives with and through, not despite, difference, and views difference as productive. There are pedagogical opportunities to embrace diversity and this study has looked at how to reflect diverse meanings in a reciprocal curriculum. The key question is how to draw on the representational resources of diversity in an equitable and pedagogically productive manner. We need a new form of articulation of our pedagogical standpoint, one that has not grown out of the old order, but out of the new dispensation.

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