

**Access to Academic Practices in an Engineering
Curriculum: Drawing on students' representational
resources through a multimodal pedagogy**

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Abstract

This study identifies the representational resources that diverse students draw on in the production of a range of genres and looks at how these can be included in teaching, learning and meaning-making. The site of research is a first year Communication Course in an engineering foundation programme for students from disadvantaged backgrounds. In South Africa, there is still differential access to economic, educational and cultural resources, and institutional discursive practices in higher education can serve to include or exclude particular groups. The challenge is to offer students from educationally disadvantaged backgrounds an empowering and critical curriculum, not just bridges to established norms. This study examines ways of mediating the multiple gaps between the practices of students on entering the tertiary context (from their school or work environments) and the specific academic practices of the university. It looks at the ways in which these resources are utilized in differently regulated genres in the course and focuses on student 'interest' in using particular forms.

The study explores students' resources through textual analysis, employing a social semiotic multimodal approach which links the social with the representational. The assumption is that any text involves a multiplicity of signifying systems. I concentrate my analysis on the coding orientation of the texts, the most prevalent discourses and the underlying ways of organizing knowledge.

I attempt to show how diverse ways of thinking and representation are similar to and differ from those valued by the discipline of engineering, and consider what could or should be preserved. The study reveals that 'scientific' forms of reasoning from students' life worlds could be drawn on, as well as local lexis used incisively in the scientific domain. Students' capacity for conceptual work pre-dates the engineering curriculum and they bring frames of reference that form the potential building blocks for scientific thinking. I look at the 'recontextualization' of students' representational resources across differently regulated genres to see which resources persist unchanged, undergo transition, or disappear.

A major contribution of this study to theorizing pedagogical transformation is the emphasis on the modal aspect. Visual representation enables certain students to engage with complex analytical processes which could have implications for students who have English as an additional language students and struggle with conceptual representation in the written mode. Utilizing a range of modes is a way of drawing on students' resources and these multiple forms of representation, which have always been a part of the engineering discipline and profession, need to be validated.

The study ends with a consideration of the implications for curriculum and argues for the importance of thinking of curriculum as a two-way exchange of resources rather than uni-directional transmission. The discourse and knowledge of the discipline should be made available, while students' practices and resources should be utilized and validated. We can harness students' representational resources through making these resources visible, developing metalanguages to describe and reflect on practices, and creating less regulated spaces in the curriculum where they can be used.

Cognisance needs to be taken of various social aspects of engineering and their semiotic realization, like the tensions between tradition and development, nostalgia and utopianism, nature and society, the individual and the collective. The 'reciprocal curriculum' is based on the premise that the tension between convention and a dynamic for constant change is the norm.

The significance of this research is that it enables understanding of the semiotic practices of students who have variable access to the institutional processes of education. This is important in South Africa at the moment with state policy that is committed to increased access, redress and equity in tertiary education.

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Chapter One: Introduction

1.1 Initial problem identification

My interest in this research began in 1999 while teaching a Communication Course, focusing on academic literacy practices, to first year engineering students. The course is about rural development and the students have to research a particular area and make recommendations for scientific interventions. Their proposals for the development of a rural village take the form of a poster. (More information on the curriculum site is provided under section 1.3 of this chapter, and is discussed in detail in chapter three). I became interested in multimodal approaches to academic literacy practices when I started to look more closely at the posters that the students produced.

The posters raised a number of interesting questions for me. They made me wonder whether different modes and genres enable different competencies, social relations, and degrees of affective involvement. It seemed to me that causal relationships between technology and society were expressed to a far greater extent in the poster genre than in students' written reports. For instance, in the following extract taken from one of these early posters, the blend of pathos and technological detail and the idea that technological advancement can address social ills, reveals a sense of 'technology' not being separate and abstracted from people's lives. It became clear to me that the traditional engineering curriculum does not have a vocabulary to deal with this kind of knowledge, and I became interested in exploring what such a language, or metalanguage, would comprise.

'll help heal his scars



Figure 1: Extract from a 1999 student poster

In looking at the posters as multimodal texts, I became interested in the range of representational resources that students draw on. Representational resources and the practices associated with them are the “means and practices by which we represent ourselves to ourselves and to others” (Kress 1996a: 18). What interested me were the potentials and limitations of these resources in the tertiary environment (for instance, the perceived ‘inappropriacy’ by the engineering faculty of many of the resources operating in the students’ posters). Related to this, I wished to explore the

transformative actions of the students. In other words, I became interested in focusing on students' interest and motivations for the uses of particular forms, rather than focusing on inappropriacy, insufficiency and incompetence. This focus on the lack of student competencies is unfortunately too often prevalent in South African contexts.

The teacher role pushes one into a deficit view of student competencies to a certain extent because of the need to assess their work. A study like this requires suspending an interest in the formal curriculum in order to focus on what students bring with them and suppressing the focus on the explicit curriculum in order to surface students' representational resources. The study does not address pedagogy in terms of formal learning, but in terms of dialogic processes. I have chosen for analysis nine student texts which emerged in the 2002 Communication Course. These texts are from both formal and informal spaces in the curriculum. I do not focus on assessment of the texts or any kind of evaluation, but focus on textual analysis – investigating students' resources and their interpretations of these resources.

1.2 Aims of research and research questions

The aim of this research is to contribute towards developing a pedagogy that provides access for previously disadvantaged students to academic practices in a way that is sensitive to different students' subjectivities. My aim is to devise a process for identifying, describing and analysing the representational resources of diverse students, including the relation between these resources and the expectations of the university. I investigate whether different modes (realized through a range of genres) invoke different competencies, ways of knowing, social relations and degrees of affective involvement.

The following research questions enable me to identify and explore students' representational resources:

1. What are the representational resources that students in an engineering foundation programme bring with them to the tertiary education context?
2. How do students utilise and adapt these representational resources from the larger semiotic landscape in the reception and production of a range of genres within academic conventions?

2.1 What happens when different kinds of 'cultural capital' (Bourdieu 1991) encounter different generic forms, structures, symbols and ways of presenting information?

2.2 What are the processes of production involved in a range of genres in different media (both familiar and unfamiliar to the students)?

3. How can these representational resources be drawn on in curriculum design in tertiary education to develop a pedagogy of diversity and unity?

In addressing these research questions, I hope to make visible those resources which are often not noticed or not valued by the academy. I wish to analyze the ways in which students deploy these resources when encountering academic discourse for the first time, and to think about how to include certain kinds of traditionally excluded resources in the curriculum. Rather than students conforming to a narrow sense of appropriate behaviour, a dialogue needs to be set up between what students bring and what the institution expects, in order to evolve an innovative curriculum. It is clear that this study does not advocate a path of induction into the academic discipline of engineering in order to simply preserve its established ways of thinking and representing. Rather, I look at resources holistically. In looking at students' representational resources, I attempt to show how the students' ways of thinking and representation are similar to and differ from those valued by the discipline of engineering, in order to consider what could or should be preserved. The task is to identify students' own resources, make these explicitly available to the students, and then link these resources to engineering tasks.

In order to locate my research questions, I describe the context for the study in the next section of this chapter. This includes the global and national context, as well as the context of the Communication Course which is located in a particular tertiary institution.

1.3 Context for the study

The context for this study is a South African university over the period 2000 – 2003. In South Africa and internationally higher education has been undergoing a major transformation. Traditionally, universities presented specialist education to generally

well-prepared and socially homogeneous students. However, curricular goals and practices are being reconsidered in response to social, economic and political change. Although much has been done since 1994 to redress social injustices in secondary education in South Africa, the legacy of apartheid is still prevalent in a non-equitable educational system. Students enter the university from a wide variety of educational and language backgrounds. The university in the study is a historically white university¹ with a growing number of black² students. There is now increasing diversity within the student population in terms of 'cultural capital' (Bourdieu 1991) as well as educational preparedness with regard to linguistic competencies (specifically in English, which is an additional language to most of these students), numeracy, visual and conceptual analytical competencies. Students who have not had practice in the more cognitively demanding and abstract tasks provided by quality schooling, can sometimes be at a disadvantage in the tertiary context. Students from under-resourced old apartheid-type schools are often under-prepared for the complex cognitive and sociolinguistic contexts of the university.

In an effort to address the realities of educational transformation, most South African tertiary institutions developed 'academic development' programmes. Academic development initiatives are a locus for change which attempt to transform the teaching and learning processes, to encourage academic excellence, whilst democratizing and extending access to education. Initially, the academic development initiatives in the mid 1980's involved providing language 'support' to students which was not always integrated into the curriculum, but was seen as something 'added on'. After 1990 there was a critical turning point in the curriculum debates inside South Africa. There was a shift to integrate academic literacy and language competencies into the curricula of the disciplines in a more developmental approach. In this shift, there was an acknowledgement that the institution, too, was 'under-prepared' in many ways to accommodate change (Moore et al 1998: 11).

¹ Historically white universities are those which, under apartheid, were restricted to providing education to those classified 'white' in South Africa.

² Given South Africa's past racial classification system under apartheid, it is necessary to explain the term 'black'. In this case, 'black' refers to African students, as well as those designated 'coloured' and 'Indian' under the previous regime. Under apartheid, the government schools were divided along the lines of racial classification, and black African students attended schools governed by the Department of Education and Training (DET).

Tertiary institutions in South Africa need to transform in order to accommodate changing global and local circumstances. The vision contained in the Education White Paper (1997) is that a transformed, democratic, non-racial and non-sexist system of higher education will “promote equity of access and fair chances of success to all who are seeking to realise their potential through higher education, while eradicating all forms of unfair discrimination and advancing redress for past inequalities” (1.14). This vision addresses the formal aspects of access to tertiary institutions, but does not necessarily address epistemological access to discursive practices. The White Paper also calls for higher education that will “contribute to the advancement of all forms of knowledge and scholarship, and in particular address the diverse problems and demands of the local, national, southern African and African contexts” (1.14). Enabling access to academic practices and drawing on students’ resources are the twin pedagogical and political ideals underlying this research. In order to enable access to dominant academic practices, the discursive and generic conventions of the discipline need to be made available to students. At the same time, students’ practices, resources and discourses need to be used and validated.

An academic development initiative serves as the site for this research, namely an engineering foundation programme. This programme includes ‘academic literacy’ courses which are integrated into the content curriculum, and includes a year long course entitled ‘Introduction to Communication’, which is the setting of this study. Both the foundation programme and the Communication Course aim 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 the Communication Course, a simulated work situation is created, and authentic work life genres are used and adapted (whilst retaining a focus on traditional academic genres). The course is designed around a particular project, the Rural Village project, which I describe in detail in chapter three (section 3.4.3). This course introduces the idea of sustainability to the students, seeing engineering as creating a more socially just and environmentally sustainable world for ourselves and for future generations. In teams of four, the students investigate the infrastructural and

developmental needs of an existing rural settlement in South Africa. In the Rural Village project, students have to assume the roles of learners, professional consultants, engineers, and researchers. Expert-novice relations are established between rural students who know the chosen area and those who do not. Also, within the group, each consultant researches one aspect of rural development and shares 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). Groups made up of people from different social backgrounds, who do not share the same 'common sense', are unlikely to have the same interpretations of texts and situations. As Janks and Ivanič say, "the range of perspectives available in the group serves to denaturalize all perspectives" (1992: 321). 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 against those of others.

In the specific context of South Africa's history of racial discrimination, this particular university has identified diversity as a key curricular issue requiring specific attention. The Communication Course attempts 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. Often the culture shock of students coming to the university from the rural areas and from urban working class backgrounds is immense. The rural focus of the project 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).

1.4 Overview of the thesis

Chapter two presents the theoretical framework for the research in terms of approaches to and analysis of data. The chapter outlines key debates in the literature on academic literacies, access to Higher Education, multimodal pedagogy, and shows how this study is positioned in relation to them. The chapter begins by describing a multimodal approach to pedagogy and research, and provides a rationale for this approach. I look at the relation between meaning, text and practices, and argue that in

meaning-making, signs are constantly transformed and are transformative. Thus, change and creativity are the norm. I highlight the ideological nature of discursive practices, examine questions of access to academic practices and argue for transformation of these practices.

Chapter three contains a description of the academic development programme in engineering in which the Communication Course is embedded. The chapter provides an overview of the course, in terms of its overall structure (as an extended project and role play), and points to the moments when the texts which function as the data of this study were produced. It also describes some of the concepts of the course, namely 'rural', 'landscape' and 'culture'.

Chapter four presents an organizing framework for the research in terms of approaches to the analysis and understanding of data. I outline some key ethical considerations for the study, such as my role as both teacher and researcher, and the importance of reflexivity. The chapter provides detail on the methods of data collection, including students' texts, interviews, student reflections, questionnaires. In addressing the research questions, I use textual analysis as the main method of data analysis, rather than the interviews or surveys. This is because what the resources mean to students is secondary in my analysis and my primary focus is on the resources themselves. The chapter ends with a description of the social semiotic method of data analysis employed in the study, and a framework for identifying representational resources across genres.

Chapter five addresses the first research question: "what are the representational resources that the students in an engineering foundation programme bring with them to the tertiary education context?" In order to identify and describe these resources, I focus on the data generated by one component of the course, the Symbolic Object project. Here students identify and investigate everyday objects with symbolic meanings in particular communities of practice. I analyze students' resultant textual products according to the framework for identifying representational resources, which is outlined in chapter four. I also look at authorial voice and the constructions of social relations in the texts.

Chapters six and seven also address the first research question. The focus in chapter six is on the written reports. Chapter seven focuses on the posters produced by the students at the end of the course, in which students propose suggestions for development of a particular rural area. These completed textual products are the culmination of the work on the course. The demands of the investigative report and the poster are described at a meta-level, including the institution's expectations of these genres. The students' reports and posters are analyzed in the same way as the Symbolic Object projects in chapter five, concentrating on the coding orientation of the texts, the most prevalent discourses and the underlying ways of organizing knowledge.

Chapter eight addresses the second research question, "how do students utilise and adapt representational resources from the larger semiotic landscape in the reception and production of a range of genres within academic conventions?" I look at how the representational resources identified in the Symbolic Object posters are transformed, persist or disappear in the more regulated genres of the reports and the rural village posters. What are the differences in students' uses of resources across texts? I concentrate on modal³ differences (both posters and reports cover the same content matter and both are regulated genres, but they differ in the media and predominant mode of production); pedagogical differences (the emphasis placed on these texts in the curriculum, the time and marks allocated to them); and temporal differences (the place of these texts in the curriculum across the year of the course).

The final chapter, chapter nine, draws out the implications of the study for curriculum design and addresses research question three: "how can students' representational resources be drawn on in curriculum design in tertiary education to develop a pedagogy of diversity and unity?" Political issues of equity are engaged with, as well as technical questions (i.e. "which resources are able to perform certain functions better than others?") I ask what kinds of resources are privileged through existing practices, and how can traditionally excluded resources be included in teaching,

³ I use the term 'modal' here in the sense of 'mode' (i.e. culturally shaped material available for representation). At other times, I use the term in the way it is used in linguistics, to indicate a modal auxiliary.

learning and meaning-making. In addressing these questions, the chapter argues for the importance of a multimodal approach to pedagogy, where the limits of the written and spoken modes for representing all experience are recognized, and argues for the validation of the multiple forms of representation which have always been a part of the engineering discipline and profession. The chapter explores how to devise pedagogical procedures to sensitise learners to the communicative demands of academic disciplines. I argue for a 'reciprocal curriculum' that draws on students' experiential knowledge and representational resources.

Chapter Two: Theoretical Framework

2.1 Overview of chapter

My theoretical framework is broadly a social semiotic multimodal one which establishes links between the concepts of 'habitus', discourse and practices. This chapter presents the theoretical framework for the research in terms of approaches to and analysis of data, and provides a rationale for a multimodal approach to pedagogy and research. I outline the key theoretical debates on academic literacies and access to Higher Education, and show how this study is positioned in relation to them. In looking at questions of access to academic practices, I argue for the transformation of these practices.

2.2 Rationale for a multimodal approach to pedagogy and research

Although humans have a semiotic instinct, a need to represent, it does not necessarily rest in language. Meaning is the result of complex relations between various co-deployed semiotic systems. Multimodality is concerned with "the multi-semiotic complexity of a construct or practice" (Iedema 2003: 40), and provides the means to describe a practice or representation in all its semiotic richness.

The project of multimodality is an attempt to make the point overtly and decisively that an interest in representational modes other than speech or writing is essential and not merely incidentally interesting ... from an occasional interest in other semiotic modes this project moves to a norm where all texts are seen as multimodal and are described in that way. (Kress and Ogborn 1998 in Iedema 2003: 39)

Multimodality is emerging as both a theory of communication and a particular approach to pedagogy. As a theory of communication, multimodality accounts for the multiplicity of modes of meaning-making, and contributes to the theorizing of links between shifting semiotic landscapes, globalization, re-localization, and identity formation. In *Multimodal Discourse*, Kress and Van Leeuwen argue that meaning is made in many different ways, in the many different modes and media which are co-present in a "communicational ensemble" (2001: 111). In trying to demonstrate the characteristics of these ensembles they have sketched a multimodal theory of communication which concentrates on the semiotic resources of communication (the modes and media used), and the communicative practices in which these resources are

used. As a particular approach to pedagogy, a multimodal pedagogy seeks to go beyond written and spoken language to value a range of modes through multimodal assessment practices. This pedagogy recognizes the limits of language for representing all experience, and therefore encourages classroom tasks that require multiple forms of representation.

Multimodality points to the recognition of the interconnection between different modes (see section 2.4.2.3 for a discussion on ‘mode’). It is thus a very useful concept in a discipline like engineering which has always been visual in orientation, both in terms of problem solving and in the representation of information. The interaction between modes in students’ texts is crucial for my examination of students’ representational resources.

2.2.1 Multimodality and the national and global context

Exploring issues around multimodality and textual production in tertiary education is important in South Africa at the moment, where there is still differential access to economic, educational and cultural resources. Systematic educational deprivation of black African students has led to “a persisting heritage of educational under-preparedness” (Moore 1996: 72). As I argued in chapter one (section 1.3) there is diversity in terms of language, culture and educational preparedness within the student population in most South African tertiary institutions. Finding ways of designing the curriculum to accommodate this diversity is becoming critical. The challenge is to offer students from disadvantaged backgrounds an empowering and critical curriculum, not just bridges to established norms.

Theorizing a multimodal pedagogy of diversity and unity is not only important in South Africa, but globally as well, in contexts of multicultural and multilingual societies, technological change, globalized and re-localized media, sub-cultural differences. Contemporary engineering has become a global enterprise. With globalization, the clear boundaries around previously distinct practices and the domains of distinct professions have begun to unravel. As other cultures come to articulate their relationship to the development of technology, the globalization of engineering is changing the profession from its former identity as a Western, white, male domain (Johnston, Lee, McGregor 1996).

Since the mid '90's, the New London Group (NLG), a group of ten applied linguists, has argued that there is a semiotic shift from the verbal to the visual globally, and there is an increasing multiplicity and integration of modes of meaning making, including, the audio, the spatial, and the behavioural (NLG 1996: 64). Part of this shifting semiotic landscape includes technological change and information technologies, which are altering the role and significance of the major media of dissemination, transforming the ways in which we communicate with each other, and transforming the ways in which information is produced, distributed and accessed (Costanzo 1994, Snyder 1997, Selfe and Hilligoss 1994, Kress 2003). The implication of the shifting semiotic landscape for Higher Education is that the burgeoning variety of multimodal text forms associated with new technologies needs to be given more recognition, and to be reflected in the curriculum.

2.2.2 Multimodality and access to academic practices

In general, there has tended to be an overemphasis on the teaching and analysis of the mode of writing in academic literacies studies. Although this emphasis has been placed on writing for sound pedagogical reasons, Kress and Van Leeuwen (1996), Kress (2000a; 2000b), Stein (2003), the NLG (2000) and others have pointed to the overemphasis on logocentricism, the significance of 'writing' as a mode (often to the neglect of other modes and their interconnectedness). In academic literacies studies, explorations have centred on student voice, and plagiarism (Angelil-Carter 1995, 2000); what students do with feedback (Lea and Street 2000, Clark and Ivanič 1997); debates around genre and process approaches to teaching writing (Delpit 1988, Cope and Kalantzis 1993). As a theorist and practitioner in the field of academic literacy practices, I am interested in all of the above in order to understand power relations in the acquisition of these practices. However, I argue that it is important to look at these issues within a broader understanding of the multimodal nature of communication contexts.

I investigate whether multimodality can be a way of exploring identity in textual production with students. Do different modes enable different kinds of being and knowing? Producing text in the written mode can be a major stumbling block to students, especially as many students in South Africa have to write in a language that

is not their own, and have to adopt discipline-specific discourses or genres. This may mean sacrificing aspects of their identity. Feeling the right to exert an authorial presence in a written text is related to personal autobiography. It is a socially conferred position and is often associated with the gender, class and ethnicity of the writer.

Some theorists in South Africa have researched multimodality with equity and access issues in mind. For instance, Stein (2001; 2003) argues that multimodal approaches are theoretically more equitable than monomodal pedagogies. On the other hand, Thesen (2001) acknowledges that multimodal texts in the curriculum raise new and interesting questions about power and access, but may not necessarily open up access routes in a word-based field such as humanities. She argues that multimodality in the humanities requires students to engage with four 'layers' of language. This can be an extremely complex exercise. These four layers of language include: the English language system, academic discourse, mode-specific language associated with the analysis of the visual and a metalanguage of critical analysis.

In this study, I am aware of the complexity of positing multimodality as alternative access to inducting students into academic practices, and I do not see multimodality as a step on the way to improved writing practices. Such a conception would still valorise the mode of writing. Rather, I explore what happens when different kinds of 'cultural capital' (Bourdieu 1991) encounter a range of generic forms, structures, symbols, and ways of presenting information. I examine what resources students bring to genres, and the ways in which this cultural capital can be incorporated to change the nature of the genre itself. My approach to pedagogy is to establish a dialogue with the resources that students bring, rather than a prescriptive promotion of what the academy might expect.

To do this, I identify a range of students' 'representational resources', and look at the way in which students utilize these across a range of genres. 'Resources' refer to the complex of knowledge, understandings and experience which comprise an individual's subjectivity. 'Representational resources' include abstract resources such as discourses, concrete resources such as materials, structures such as genres and sequences such as syntagms. This study makes the argument that only resources

which are visible as communicational and representational resources and which are officially recognized as such can become available as elements in conscious design processes. To this end, metalanguages need to be developed to help make visible the nature of the resources being used. Also, these resources need to be valued in multimodal assessment procedures.

2.3 Meaning-making as social semiotic multimodal process

My theoretical view on meaning-making is that it is a social semiotic, multimodal process, and always occurs as a result of the active, interested design of the sign-maker. In this view, semiotic competence involves the successful negotiation of communication ensembles, and moving between (or ‘transduction’ between) semiotic systems.

There are different theoretical approaches to meaning, each of which produces a particular pedagogical stance. Meaning can be seen as a static, reified product residing in texts. In this approach, meaning exists independently of human interaction and external forces. Gee argues that the view that language form fits ‘hand-in-glove’ with meaning is a common misconception in language study (1990: 99). The underlying view in my study is that meaning is not a product. Rather, any textual representation is a social act which takes place within a particular institution, with a particular history, culture, set of values and practices. This is a point well established in the work of Halliday and other social semioticians. According to Halliday, ‘social semiotic’ means “interpreting language within a sociocultural context, in which the culture itself is interpreted in semiotic terms” (1978: 2). All semiotic systems operate as systems of social positioning – at the level of interpersonal relationships and at the level of struggles for hegemony among social groups in any society. The field of social semiotics is primarily concerned with human semiosis as an inherently social phenomenon, where meaning comes into being between participants rather than being transmitted from one to another. The organizing concept of a social semiotic approach to analysis is that meaning is multiple and arises as a consequence of choice (Jewitt, Kress, and Ogborn 2000: 268).

Meaning-making always occurs as a result of the interested action or ‘design’ of the sign-maker. According to Kress, the notion of design starts from “the interest and the

intent of the designer to act in a specific way in a specific environment, to act with a set of available resources, and to act with an understanding of what the task at hand is, in relation to a specific audience” (2002: 180). I contend that design occurs whether the designer is conscious of intent or not. Even a ‘random’ outcome has been produced through (subconscious) interest. Design (using multiple modes and media) is a generative concept for thinking about access to academic practices as it is premised on a notion of human agency. However, the use of the notion of design without understanding how dominant practices perpetuate themselves, runs the risk of an unconscious reproduction of these forms (Janks 2000: 178).

The tension between the potential for transformation and reproduction in semiosis is discussed by, amongst others, Fairclough (1992a, 1995a), Clark and Ivanic (1997) and Bakhtin (1998), in his emphasis on struggle in meaning-making. Kress and Van Leeuwen (2001) argue that on the one hand, semiotic practice is always reproductive at some level where the discourses at play or their modes of articulation are reinstated. This occurs in certain established genres. On the other hand, semiotic practice is always also productive and transformative. A particular configuration of discourses and their modal articulation inevitably produces a new and transformed arrangement which affects each of the contributing discourses. The notion of transformation is crucial for my study. The emphasis is on social transformation (power and authority), but the notion of transformation can also be interpreted in the narrow semiotic sense.

When talking about transformation from one mode to another, Kress uses the term ‘transduction’. Transduction involves “a system both of expression and recording in physical, material and permanent form the meanings expressed in the first semiotic system in ways which are specific to the second semiotic system” (Kress 1992: 193). This notion of transduction is crucial for the purposes of my study, where the emphasis is on students learning different kinds of academic literacy practices and associated modal patterns, as well as ways of moving between them. It is important to look at how meanings shift across mode, media and genres.

In sum, my social semiotic approach views signs as motivated, rather than arbitrary, and sees meaning as interactional, with text-internal as well as text-external conditions of meaning.

2.4 Text as social action

Meaning potential is actualised in the form of text. In other words, knowledge does not exist until it is realized, given representational form. Kress talks of text as ‘punctuations’ in the semiotic process: “semiosis is ceaseless, and without fixing and framing we would have nothing tangible and graspable. Punctuation in that sense both fixes and frames elements” (2003: 122). The significant factors that are fixed and framed by text are discourse, genre and mode (each of which I discuss in section 2.4.2 of this chapter). I use the term ‘text’ to refer to any instance of communication in any mode or combination of modes, and not to linguistically realized entities only (Archer 2001).

My theoretical approach to text is developed from Halliday's (1985) social semiotic account of language. Text in Halliday's conceptualization constitutes a mode of social action. Halliday refers to three kinds of semiotic work called metafunctions. He distinguishes between the ideational, interpersonal and textual metafunctions. The ideational metafunction represents objects and their relations in a world outside the representation system. The interpersonal metafunction refers to the part language plays in creating interactions between producers of texts and audiences. Interpersonal meaning locates participants – individual, institutional, abstract – in a system of social relations, social viewpoints, evaluative orientations and affective identifications. The textual metafunction refers to the capacity to form coherent complexes of signs or texts. Textual meaning enables the producers and users of text to make and recognise patterns and relations so that the various elements in the constituting discourses relate to each other. What is important and useful about a Hallidayan view is that it provides a way of looking at semiosis in terms of socially meaningful tensions and oppositions which can be instantiated through textual structure. (The way in which the Hallidayan view of text is operationalized in my research is described in chapter four, section 4.6.2).

2.4.1 Dialogism of texts

One of the most significant properties of texts is their interdiscursivity and no text is ever monolithic without space for alternative visions. Texts reflect and recycle different discourses. Some of these differing discourses may complement each other, and others may compete with each other or represent conflicting interests or

ideologies. This is Bakhtin's (1981) notion of dialogism, the recognition of the polyvocality of any sign. Some texts are more dialogic than others, and dialogicality is less valued in a more regulated environment.

The concept of dialogism is useful in exploring the dialogue between students' primary discourses and the discourses they encounter at university. This often plays out in students' textual productions. The concept also helps to explain the contradictions evident in the students' texts. For instance, a gendered discourse of exclusion could exist side by side with a democratic participatory discourse. Dialogism is important in understanding students' productions of the dominant scientific academic discourse, where degrees of authorial agency and degrees of affect are key indicators of traces of other discourses.

The concept of 'intertextuality' (Kristeva 1986), and the related concept of 'provenance' (Kress and Van Leeuwen 2001), are as useful for my analysis as the concept of dialogism. The term 'intertextuality' refers to the fact that any one text is positioned in relation to a network of other texts, and thus is the naming of a general semiotic process. 'Provenance' is an instance of that process that can be located in the sign. Provenance refers to the fact that we "constantly import signs from other contexts (another era, social group, culture) into the context in which we are now making a new sign, in order to signify ideas and values which are associated with that other context by those who import the sign" (Kress and Van Leeuwen 2001: 10). Students import signs from a range of domains (school, cultural, personal) in producing curriculum-based texts. These signs have provenance in the different domains, but are also redefined by the new context. So, for instance, an item of clothing such as a pair of trousers accrues multiple meanings in the students' textual productions. A sign that signifies through provenance evokes a discourse or set of discourses, but without making that discourse or set of discourses overtly explicit. Communication by means of provenance is usually an invention of the moment - ad hoc and unsystematic, and it enables more openness than in less dialogic texts (Kress and Van Leeuwen 2001: 73).

Bakhtin's notion of 'addressivity' is key to understanding the dialogism of texts (Bakhtin 1986: 95). Addressivity encapsulates a fundamental aspect of language,

namely an utterance's quality of being directed at someone. Both the composition and the style of the utterance "depend on those to whom the utterance is addressed, how the speaker (or writer) senses and imagines his addressee, and the force of their effect on the utterance" (Bakhtin 1986: 95). Addressivity also refers to the way in which all meaning-making involves drawing on the meaning-making of others. Any utterance is situated in a broader, historically situated "chain of speech" (Bakhtin 1986: 91).

The topic of the speaker's speech ... does not become the object of speech for the first time in any given utterance; a given speaker is not the first to speak about it. The object, as it were, has already been articulated, disputed, elucidated, and evaluated in various ways. (Bakhtin 1986: 93)

Addressivity includes the discourses that students bring with them in their specific acts of semiosis, as well as the discourses they feel they must respond to within the context of tertiary education. For instance, they perceive and construct scientific academic discourse in particular ways, and respond to this in their own textual productions.

In sum, all texts are intertextual, they refer to other texts. All texts borrow from other discourses (provenance). All texts are dialogic, they respond to prior texts and anticipate future texts. Intertextuality, provenance and dialogism are evident in my analysis of the students' uses of representational resources in their textual productions.

2.4.2 Constitution of text: Discourse, genre, mode

Text is the main unit for my analysis and I regard it as being constituted through discourse, genre and mode. Discourse is the expression of what is being talked about. The expression of the social matters (who acts and in relation to whom) gives a shape to text, the 'genre'. Finally, the 'stuff' of our communication is fixed in a 'mode', providing the material resource through which text is materialized (Kress 2003: 47). Since the concepts of discourse, genre and mode are key in my theoretical framework, I shall now give an account of each concept. I return to these concepts when outlining my framework for analysis in chapter four, section 4.6.2.

2.4.2.1 Discourse

A text is the site of emergence of a number of discourses at the same time, although some texts are more ‘dialogic’ than others (Bakhtin 1981). In other words, they contain differing and sometimes competing discourses. There is a traditional linguistic understanding of the term ‘discourse’ which is used to indicate a chunk of language longer than a sentence (Crystal 1995: 451). In line with Fairclough (1992), Gee (1996), Kress (1985), I use the term discourse to signal more than ‘language in use’, as a type of social practice. A discourse involves power relationships, embeds an ideology, and privileges not only some groups of people but their symbol systems as well (Gee 1996). Gee refers to ‘Discourse’ with a capital ‘D’ as socially embedded “saying (writing) – doing – being – valuing – believing combinations” (Gee 1990: 142) and distinguishes this from discourse with a lower case ‘d’, which he uses to refer more specially to language. The understanding of discourse that I work with in this study is that developed within recent social theory, based on the work of Foucault, to refer to the ways social institutions define and regulate the practices which occur in those institutions. In other words, discourses are “socially constructed knowledges of (some aspect of) reality which give expression to the meanings and values of an institution or social grouping” (Kress and Van Leeuwen 2001: 4). Discourses are inextricably linked to ideologies and value systems in particular contexts. Discourse practices can be seen as the deployment of dominant ideological practices, but also, at times, as acts of resistance to dominant ideological practices. (I refer to engineering discourse in section 2.5.2.1)

2.4.2.2 Genre

Texts may be framed in highly regulated ways, according to socially produced generic conventions. The term ‘genre’ refers to the aspect of textual organization which “realizes the social relations of the participants involved in the text as interaction” (Kress 2003: 108). If the social actions are relatively stable and persistent, then the textual forms (the generic shape) become relatively stable and persistent. ‘Genre’ is a category that describes the relation of the social purpose of a text to the textual structure. The socially constructed nature of genres is particularly evident in the academic context where each discipline and course presents students with appropriate knowledge, appropriate ways of organizing that knowledge and appropriate ways of representing social relations between the writer and reader (Kress 1982: 123). Thus,

genre is about conventions at work in a domain of practice. Some engineering genres include investigative reports, laboratory reports, posters and proposals. As with text, genre is not a mode-specific category and can apply to all forms of representation and communication, not just linguistic forms. Genre pedagogy has made us think about how and whether to make generic features visible in order to give students from marginalized discourses greater access to dominant forms. (I discuss ‘genre pedagogy’ in some detail towards the end of this chapter, section 2.5.2.2).

2.4.2.3 Mode

Mode is the means for realizing text, the culturally shaped material available for representation (for example, written language, spoken language, visual representation). Mode is a ‘resource for making signs’, the signifier material which can be used to carry the signified (the ‘meanings’) of sign-makers (Kress and Van Leeuwen 2001: 57 - 58). My interest in ‘mode’ is as a representational resource – it is semiotically organized (a regularized means of representation) and it has a cultural history.

Kress and Van Leeuwen use the term ‘mode-like’. What makes a mode ‘mode-like’ is “its availability as a resource for making signs in a sociocultural group” (Kress and Van Leeuwen 2002: 346). If a mode is “that material resource which is used in recognisably stable ways as a means of articulating discourse” then, they go on to say, “some actions in some domains may be entirely mode-like, others may be quite mode-like, and yet other actions may not be highly developed as modes at all” (2001: 25). For instance, computer mediated communication falls somewhere between the modes of speech and writing, thus pointing to the difficulty of delineating a mode in a clear-cut, bounded way. In my study, rather than trying to identify discrete modes occurring together, I ask, along with Kress and Van Leeuwen, “what ensembles of resources are being produced?” (2001: 125)

2.5 Changing academic practices

Making meaning in a tertiary context, on the one hand, draws on and responds to discourses from the different domains of the students’ socio-cultural life world, the habitus of the individual; and, on the other hand, it responds to discourses and

practices within the institution. In this final section of the chapter, I examine questions of access, acculturation and transformation, and what Gee has called the “paradox of literacy” (1990: 67): the teaching of essayist literacy may enable students from previously disadvantaged backgrounds to participate in tertiary education, but at the same time it inevitably involves socialization into dominant practices.

2.5.1 ‘Academic practices’ as a theoretical construct

2.5.1.1 ‘Literacy’ versus ‘academic practices’

My choice of the term ‘academic practices’ is rooted within a larger theoretical and political debate surrounding the term ‘literacy’. There is the common-sense understanding of the term ‘literacy’, as referring to reading and writing, particularly in the school setting. This is what Brian Street (1995) refers to as the ‘autonomous’ view of literacy, the claim that literacy has cognitive effects apart from the contexts in which it exists and is used. This understanding of the term is often used in conservative arguments about the ‘literacy crisis’, the poor state of the education system, and the decline of the English language. To counter this view of literacy, what is known as the New Literacy Studies (NLS) attempts to give a social practices account of literacy, where the term ‘literacies’ refers to any form of social communication or practice that requires a semiotic code. This view of literacy as social practice, argued by, among others, Heath (1983), Street (1995), Baynham (1995), Barton and Hamilton (1998) and Gee (1996), engages with diverse notions of reading and writing that are emerging from current social and technological changes. To be ‘literate’ then does not simply mean having acquired the technical skills to decode and encode signs and symbols, but having mastered a set of social practices related to a set of signs and symbols which are inevitably plural and diverse. This is what Street refers to as the ‘ideological model’ of literacy (1984, 1995) where literacy learning involves learning particular roles, forms of interaction, and ways of thinking. According to the ideological view, there are many literacies, linked to the social institutions in which they are embedded. ‘Literacies’ are therefore understood as multiple, socially situated and contested. The spirit behind the pluralizing is an attempt to give recognition to distinctiveness and to value what particular groups in society are doing.

Brian Street (2000) argues for the notion of 'literacy practices', which emphasizes the uses of literacy in context rather than decontextualized literacy skills. The concept of 'literacy practices' attempts to "handle the events and the patterns of activity around literacy ... to link them to something broader of a cultural and social kind" (2000: 21). Street's sense of 'literacy practices' refers to the broad cultural conception of ways of doing reading and writing in particular contexts. In an attempt to draw out the implications of this approach in the tertiary education context, Lea and Street (1998) outline an 'academic literacies' approach to student writing. They argue that approaches to student writing in higher education have fallen into three main categories which can be tied to particular historical periods: 'study skills', 'academic socialization' and 'academic literacies'. The 'study skills' approach to student writing is based on a limited understanding of literacy which emphasizes surface features of grammar and spelling. The 'academic socialization' approach focuses on inducting students into the institution, which is assumed to have relatively homogeneous norms, values and cultural practices. Lea and Street advocate an 'academic literacies' approach, which takes into account issues of identity, institutional relationships of discourse and power, and the contested nature of writing practices. According to this view, a feature of academic literacy practices is "the requirement to switch practices between one setting and another, to deploy a repertoire of linguistic practices appropriate to each setting, and to handle the social meanings and identities that each evokes" (1998:159).

In Kress and Van Leeuwen's earlier work (1996), they used the term 'literacy' in a similar way to New Literacy Studies, namely to refer to any social communication or practice that requires a form of language code. They argued that "educationalists should perhaps begin to rethink what literacy ought to include, and what should be taught under the heading of 'writing' in schools" (1996: 32). They viewed the visual as a 'language' and described a 'grammar' of visual design, namely the conventions that have become established in the course of the history of visual semiotics. In Kress's later work, however, he moved away from the New Literacies Studies position. He also moved away from his own earlier view of the visual as language, and the use of the term literacy to encompass all modes, as in the term 'visual literacy'. Kress's later theoretical position (2003: 23-25) is to oppose extending metaphors from language to other forms of representation, and to define literacy as a

label for 'lettered representation'. He emphasizes the need to focus on the potential of the material which is involved in different modes of production and argues that "practices can only be understood when the potentials and limitations of the tools with which one practices are understood" (2000a: 15). He argues that, by using an homogenizing term like 'literacy' the characteristics of one mode are extended across the others, precluding certain questions and tending to reify literacy into skills. Reifying literacy could be based on the notion of language as a stable and fixed system, which does not necessarily include change and agency. Also, the use of a term like 'literacy' passes implicit value judgements where literacy is used as a metaphor for competence (as in 'emotional literacy' or 'cultural literacy'). This is often how the term is used in everyday speech. Kress makes a useful three-way distinction in naming practices: naming the mode or resources for representing (writing, numbers), naming the mode in use (literacy, numeracy) and naming the means of dissemination (book, website) (2003: 23).

Within current works in the terrain of literacy studies, there does seem to be some contradiction between the uses of various terms and their stated definitions, and some muddying of these theoretical issues. For instance, Barton and Hamilton refer to literacy practices as "the general cultural ways of utilising written language which people draw upon in their lives" (1998: 6) also using the term in the sense of 'the written'. However, later, they broaden this definition to include "work-place literacies" (1998: 9), meaning 'competence in the workplace'. Perhaps this theoretical vacillation is inevitable in defining new theoretical terrain.

For the purposes of my study and for theoretical clarity, I use the term literacy in a Kress-like way to refer to 'written representation', and use 'academic practices' as a larger term to refer to all communication practices used in tertiary education. I specify the modes to which I am referring when appropriate and the cluster of different sign systems attendant on these. (I define my use of the term 'practice' in some detail in the following section of this chapter, section 2.5.1.2.) I also draw on Kress's idea of 'representational resources' which implies agency and potential, rather than a term such as 'prior literacies' which implies a boundedness in time. The notion of 'prior literacies' assumes a distinct difference between school, home and university, plus a particular linear timeline of literacy practices, which are in fact more fluid.

Representational resources include both home practices and past schooling practices. As argued in the previous section, these resources emerge in texts in dialogic ways, and certain textual elements have provenance in the differing domains which constitute home and past schooling practices.

2.5.1.2 'Academic practices' and habitus

I contend that the concept of 'practice' is more useful and generative than the concept of literacy as defined by New Literacies Studies. 'Practice' offers a way of linking semiosis with what individuals as socially situated actors do, both at the level of context of a specific situation and at the level of context of culture. The term 'practice' is defined as "habitualised ways, tied to particular times and places, in which people apply resources (material or symbolic) to act together in the world" (Chouliaraki and Fairclough 1999: 21). Bourdieu suggests that a practice is an action with a history (1977: 78). Crucial to Bourdieu's concept is the premise that practice is based in time. Agents act in real time (uniquely) and their actions cannot be undone; they can only be responded to. In this conception of practices there are resonances of Bakhtin's notion of non-repeatability and dialogicality.

Semiosis is a social practice which constructs meanings and identities. Particular practices (ways of doing things with texts) become part of the everyday, implicit life routines of the individual and of social institutions. Institutional practices include knowledge-making practices within disciplines. Thinking of academic discourse as a socio-historically situated, 'privileged' practice draws attention to the contested nature of dominant academic conventions.

A person brings into any practice his or her history of experience, knowledge (whether conscious or unconscious), interests, motivations, and dispositions. Bourdieu has used the concept of habitus to talk about an individual's accumulated experience of social actions. "To speak of habitus is to assert that the individual, and even the personal, the subjective, is social, collective. Habitus is a socialized subjectivity" (Bourdieu and Wacquant 1992: 126). Habitus, as the cumulative historical experience of the individual, predisposes that individual to act in a particular way within particular social fields. A field consists of "a set of objective historical relations

between positions anchored in certain forms of power” (Wacquant 1992: 16). The field structures the habitus, and the habitus contributes to constituting the field as a meaningful world.

Bourdieu describes habitus as the “strategy-generating principle enabling agents to cope with unforeseen and ever-changing situations ... a system of lasting and transposable dispositions which, integrating past experiences, functions at every moment as a matrix of perceptions, appreciations and actions and makes possible the achievement of infinitely diversified tasks” (Bourdieu 1977: 72). This notion of a system of dispositions for coping with unforeseen circumstances links to a major thematic concern at the heart of Schutz’s (1970) work, namely that our commonsense knowledge of the world of everyday life is a system of constructs of its typicality. Schutz makes a fascinating link between familiarity and knowledge. He asks “is it not possible to interpret all types of knowledge as different degrees of familiarity?” (1970: 143). The fundamental thesis constitutive of the social world is its taken-for-grantedness, its commonness. A new experience is not necessarily a novel one. It may be new but still familiar as to its type. Thus, familiarity refers to the expectations that new experiences will be referred to the habitual stock of already acquired knowledge. This stock of knowledge contains theoretical knowledge as well as habitual ways of practical thinking and acting, patterns of behaving and working (Schutz 1970: 58-59). Students’ representational resources form a familiar stock of knowledge, and the ways in which these are drawn on and utilized in the curriculum has implications for knowledge-production. The link between the concept of representational resources and that of habitus is the following: representational resources are what an individual draws on when s/he produces textual meaning, and these resources are based on the individual’s habitus.

I propose that the concept of habitus is important in theorizing the construction of text. Textual representations are shaped both by the student’s understanding of the specific socio-discursive context and also by what the student brings to the act of representation - his/her “habits of meaning” (Halliday 1978), “stock of knowledge” (Schutz 1970) or representational resources. What is useful about the concept of habitus is that it allows focus both on the individual and the individual in a dynamic relation with institutional practices. Scollon (2001) issues a warning about the use of

the term 'habitus', cautioning that the term should not slip from the material (a particular time, place and agent) to the ideal (members of the same group that have a unitary and objective meaning). Rather than having the same habitus, two individuals can have an overlapping habitus or homologous habitus: "Two agents who have sufficiently overlapping habitus can be considered members of the same nexus of practice" (2001: 71). This is a useful warning to bear in mind when looking at a particular group of students, especially students from educationally disadvantaged backgrounds.

2.5.2 Regulation of academic practices

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). We need a closer analysis of academic practices and institutions to see the way in which relations of domination are achieved and maintained. 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). Hegemony comprises relations of domination based upon consent rather than coercion, and involves the naturalization of practices and their social relations as matters of common sense (Chouliaraki and Fairclough 1999: 24). All universal values are in fact particular values, and universal culture is thus the culture of the dominants: "What is experienced as obvious in *illusio* appears as an illusion to those who do not participate in the obviousness because they do not participate in the game" (Bourdieu 1998: 79). Earlier in the chapter I argued that meaning-making always occurs as the result of interested action or design, and that there is a tension between reproduction and transformation. Where practices have been naturalized as 'common sense', the meaning produced will be more reproductive, reinstating the dominant forms. These dominant forms include dominant languages, discourses, genres, knowledges and cultural practices.

Discursive practices are ideological in the ways in which they serve to maintain existing social relations of power (Fairclough 1992; Gee 1996). In the context of higher education, it is important to realize the ways in which existing institutional discursive practices are ideologically motivated; and the ways in which they serve to

exclude and include individuals from particular social groups. Street (1996) shows how joining a particular 'literacy club' can be problematic for those trying to learn its rules of entry from non-dominant, or disadvantaged positions in the power structures of the university and the society in which the university is embedded. Social, political and economic power is closely associated with access to and knowledge of certain discourse forms. Being socialized means "entering into and mastering a large number of discourses. Some of these may be sharply distinct from and indeed in conflict with each other" (Halliday in Rothery 1996: 91). According to Gee (1996), valued practices are not taught to those who do not already know them, with the result that formal institutions continue to privilege the already privileged in society. Lillis (2001) also argues that current pedagogy surrounding essayist literacy has a limited capacity to facilitate access to this privileged practice in Higher Education. She argues that confusion is such an all-pervasive experience for 'non-traditional' students in Higher Education that it signals an "institutional practice of mystery" (53) which works against those least familiar with the conventions surrounding academic practices.

I have argued that particular meanings and relationships around meaning-making are privileged in academic discursive practices. Lillis speaks of this as 'regulation' which works in relation to individual meaning-making, at the levels of context of situation and context of culture (2001: 14). There is 'direct regulation' (specific directions given about textual production), as well as 'indirect regulation' (implicit assumptions about norms).

2.5.3 Features of academic discursive practices

'Discursive practice' refers to the link between text and social practice (Fairclough 1992). In the university in Western societies, the privileged discourse form is 'academic discourse'. It is a socially valued practice, conferring prestige on its users. It is worth describing some of the features of this discourse. Gee (1990) specifies that academic discourse is linear; it has one central point at any one time; it is written in the standard version of a language and it aims to inform rather than entertain. In Western Anglophone academic discourse, knowledge is produced through negation and opposition (through 'argument' – thesis, antithesis, synthesis). This is the basis of Western science and Western epistemology. Academic scientific discourse functions on a framework of binaries, privileging one subsystem of binaries: logic over

emotion, academic 'truth' over personal experience, linearity over circularity, certainty over uncertainty and formality over informality (Lillis 2001: 81). The linguistic features of Western Anglophone scientific discourse include high lexical density (a large number of vocabulary items per clause); few material process clauses (a clause with verb of action); a large number of relational clauses (a clause with verb of being); and mental process clauses (a clause with verb of thinking, like 'believe'). Also, scientific discourse includes the lack of metaphor; attribution to other writers and the use of nominalization to obscure human agency (Ivanić in Lillis 2001: 79). Of course these grammatical features are not the only ones used in scientific discourse. For instance, active transactives would be the most transparent form in which to represent causal processes.

Engineering as an academic discipline is founded upon and validated by the academic discourse of science, and to a large extent, it has remained isolated from the pragmatics of engineering as a professional practice and from the social context of engineering (Johnston et al 1996, Goldman 1990, Bugliarello 1991, Beder 1999). Engineering is often seen merely as the application of science with all the principles of scientific practice assumed to cover those of engineering as well. The above mentioned features of academic scientific discourse are features of the engineering discipline as well. The academic discipline of engineering is fragmented; it does not have a clear focal centre, but is compartmentalized into separate and discrete subjects, such as mathematics, physics, and so on. Foucault argues that a discipline fixes limits for discourse and it is a "principle of control over the production of discourse" (1970: 61). However, the discipline of engineering is not constituted by a single discourse with impermeable boundaries. There are a number of discourses that define the nature and practice of engineering that exist in some tension with each other. These include management, economics, sociology, politics, and development. When I refer to engineering discourse in this study, I refer mainly to the discourse of engineering science, which is still the dominant one in the engineering curriculum. However, I acknowledge the current shifts in the discipline of engineering and the limitations of a reliance solely on science to define engineering activity. Social needs and pressures shape engineering as much as engineering and technology shape the nature of society (Sladovich 1991). My study is an argument for the need to review the inclusion of the

full range of discourses in the engineering curriculum in order to expand the currently available ways for engineers to define themselves and their work.

Engineering is based on problem-solving from first principles, and hypotheses are based in the physical world. Perhaps what is specific to engineering discourse as distinct from scientific discourse is a particular way of arguing, which links the abstract to the context-specific by weighing up phenomena against certain set criteria. This way of arguing is linked to the activity of design which is central to engineering practice. The design process begins with a selection of the problem to be addressed. The next step is to define the characteristics of an acceptable solution according to stated criteria. It is then necessary to generate alternative approaches to solving the problem, to review the alternatives against the specification, to decide on a preferred solution, and to document and communicate that solution (Johnston, Lee, McGregor 1996).

I find it useful to consider Bernstein's notion of 'recontextualization' when thinking about academic discourse. Bernstein suggests that academic discourse (or what he calls 'pedagogic' discourse) is constructed by "a recontextualizing principle which selectively appropriates, relocates, refocuses and relates other discourses to constitute its own order" (1996: 47). In this process of relocating a discourse (taking a discourse from its original site of effectiveness and moving it to a pedagogic site), a gap is created and a transformation takes place (a transformation which is ideological). The example he uses is the following: outside pedagogy there is carpentry, but inside pedagogy there is woodwork. There is a kind of gradation of discourses: those which are said in the ordinary course of exchanges and those discourses which are "said indefinitely, remain said, and are able to be said again" (Foucault 1970: 57), like the truth claims of scientific discourse. Engineering discourse also functions on a hierarchy of epistemologies, creating a disjunction between everyday commonsense knowledge and the systematized knowledge of the discipline. According to Lemke, the language of academic discourse "sets up a pervasive and false opposition between a world of objective, authoritative, impersonal, humourless scientific fact and the ordinary, personal world of human uncertainties, judgements, values and interests" (Lemke 1990: 129 – 30). While students are struggling to express new insights they

are also expected to have gained control over formalized, condensed uses of written language.

In talking about ‘academic discourse’ care needs to be taken not to construct ‘it’ as a completely discrete phenomenon. Instead, discourse practices jostle against each other, within and across domains of use (Gee 1996: 164). Exploring students’ meaning-making activities means acknowledging the ‘jostling’ of privileged discourses against marginalised, oppositional discourses. Bakhtin emphasizes the struggles and tensions involved in taking control over instances of meaning-making. “The word does not exist in a neutral and impersonal language ... but rather it exists in other people’s mouths, in other people’s contexts, serving other people’s intentions: it is from there that one must take the word, and make it one’s own” (Bakhtin 1981: 293–4). In other words, language is “populated – overpopulated – with the intentions of others” (Bakhtin 1981: 294). According to him, appropriating language, forcing it to submit to one’s own intentions and accents, is a complicated process. This resonates with Bartholomae’s (1985) notion of student-writers having to ‘invent’ the university; to invent the voices they respond to.

Every time a student sits down to write for us, he has to invent the university for the occasion ... The student has to learn to speak our language, to speak as we do, to try on the peculiar ways of knowing, selecting, evaluating, reporting, concluding and arguing that define the discourse of our community.
(Bartholomae 1985: 134 – 135)

Students must invent the university by “assembling and mimicking” its language as though they were members of a particular discourse community.

In their representations, students ‘invent’ the institutional voices that they are attempting to respond to, and, in so doing, they draw on discourses from the many socio-cultural domains of their lives. Gee distinguishes between primary and secondary discourses. The primary discourses are those which people acquire early in life within the socio-cultural setting of the family. These discourses constitute the first social identity and provide the base for acquiring or resisting later discourses. Secondary discourses are those that have to be learnt as a part of socializations within local, state and national groups outside of early home socialization. They are more public and formal (Gee 1996: 137). Students draw on primary and other secondary

discourses in learning the discursive practices of the institution. Gough (2000) makes the point that it is important to bear in mind that while a culture may not display 'academic literacy' this does not mean that such a culture does not display secondary discourse types. He gives the example of the 'izibongo' or praise poem as a Xhosa genre requiring secondary discourse types. In this study I try to ascertain the primary discourses and these different kinds of secondary discourses of students, and examine the ways in which students utilize and adapt these in the tertiary context where highly specialized secondary discourses are required.

2.5.4 Access to academic practices: Genre pedagogy

The key question in terms of equity is how to provide access to dominant forms, while at the same time valuing and promoting the diversity of representational resources of our students and of the broader society. The access paradox refers to the social, educational and political advantages of acculturation into university practices for individual students. If students are denied access, their marginalization is perpetuated in a society that values these practices. However, socialization into dominant practices contributes to maintaining their dominance and can uncritically perpetuate the status quo. Dominant practices include dominant languages, varieties, discourses, modes of representation, genres and types of knowledge.

From the early 80's, genre theorists, such as Kress (1982), Cope and Kalantzis (1993) and Martin (1993), and theorists who argue for explicit pedagogy, like Lea and Street (1998), Delpit (1988), and Heath (1983), argued that students should be taught the 'rules' of what is appropriate in a way that highlights their social constructedness. This was both a political and a pedagogical move. On the political side, they argued that learning new genres gives one the "linguistic potential to join new realms of social activity and social power" (Cope and Kalantzis 1993: 7). On the pedagogical side, they argued that writing could be taught better if the characteristics of textual forms were made explicit. The underlying assumption was that an explicit curriculum was essentially an equitable curriculum.

A critique of genre pedagogy is that teaching the explicit and implicit rules of power can potentially mean direct and formulaic instruction. The emphasis on direct transmission of text types could also lend itself to uncritical reproduction. However,

generic forms are constantly shifting, being reinvented, and remade. Scollon, Bhatia, Li and Yung (1999) have argued that the artificially 'stable' generic forms taught and valued by educational systems are different to the non-academic discourse practices encountered by the students. They point out that focusing pedagogical goals on traditional and fixed genres may limit students' advancement in the discourse practices associated with their professional work lives. Another critique of the genre-based approach is that it falls into an 'acculturation' model where the status quo of social relations is confirmed by the teaching of dominant forms, and socially legitimated ways of using language. In this way, genre pedagogy could emphasize social mobility within set structures, rather than encourage change of those structures. The acculturation model conforms to the 'academic socialization' approach outlined by Lea and Street (1998), as discussed in section 2.5.1.1. Teaching genre for conformity could reflect a deficit view of students as not having the desirable package of techniques. Genre pedagogy does not always take into consideration the context of cultural texts, their discourses and institutional sites. Luke (1996) points out that genre pedagogy tends to reify power as a possession of an individual or a text-type, rather than to see it as relational. In the design and implementation of a Communication curriculum, there should be a shift from the focus on generic forms, to making available knowledge of the potentials of the communication resources, and the possibilities of their use in specific social situations. However, in my view, there are specific structures which manifest in particular genres and it is still worth teaching about genres and generic forms. When genres are unsettled, some experts will become even fussier about standards.

What is extremely valuable about genre pedagogy is that it aims to bring generic conventions into focus, to show what kinds of social situations produce them, and what the meanings of these social situations are. In looking at academic literacy practices, it needs to be made clear that textual production is dictated by discourse conventions, and that texts are structured in reasonably predictable ways according to patterns of social interaction in a particular culture. A discourse community "shares a register and a set of institutional practices for communicating through that register" (Baynham 1995: 241). Students need to explore the nature of the discourse community they are working in to identify the discourse conventions and the dominant genres so that they can gain access to those genres. Engineering

professionals constitute a discourse community, defined as a group of people sharing the same habits of communication. Their norms of practice are created by themselves, as users, in the process of use. Thus, there are conventions underpinning shared meanings, values, and the way that knowledge is constructed and organized in a particular discipline so that members of that discourse community can understand signification.

It seems clear that genre-knowledge needs to form part of the curriculum. The question is, are the most powerful genres in society to be taught in preference to others? And, are the genres of marginal groups also to be included in the curriculum (for example, oral cultural forms)? Although genre knowledge is vital, these genres should not be taught as ideal and stable forms. Although genre is about conventions at work in a domain of practice, it is important to bear in mind that there is a tension between convention and a dynamic for constant change. This is the effect of the “constantly transformative action of people acting in ever changing circumstances” (Kress 2003: 108). Thus, there can be no sense of a ‘pure genre’; rather there is constant change, mixing and hybridisation of genres. A more generative notion of genre is not one where you learn the forms of existing kinds of texts in order to replicate them, but “where you learn the generative rules of the constitution of generic form within the power structures of a society” (Kress 2003: 121). This goes far beyond the transmission of genres. In this study I explore what happens when different kinds of habitus encounter different generic forms, structures, symbols, and ways of presenting information in the Communication Course in engineering. This multi-genre approach to academic literacy practices uses generic descriptions as an analytical resource to understand and manipulate complex cross-genre and multicultural realities.

2.5.5 Transformation of academic practices

2.5.5.1 Seeing the sign-maker as agentive

“Inventing the university” (Bartholomae 1985) suggests mimicry together with innovation. The question of the relation between structure and agency is a familiar problem in social theory. This is signalled throughout Bakhtin’s work in his emphasis on struggle in meaning-making, and is also fundamental to Bourdieu’s work which questions the structure/agency binary. Clark and Ivanič (1997), Fairclough (1992,

1995) and Kress (2000a) also point to the tensions around meaning-making and discursive practice as both reproductive and transformative.

My position on the structure/agency binary, in line with Halliday, is that the semiotic resources available to a specific individual in a specific cultural, social, and psychological history define semiotic 'potential'. Thus language users are neither wholly subject to a monolithic language system, nor completely free to create their own meanings. There are contradictions and spaces in which they can construct themselves. As argued earlier (in section 2.5.1.2), the capacity of a person to be active and creative depends upon the resources (habitus) which they have and people vary in their habitus according to social circumstances. Habitus is a structuring mechanism that operates from within agents, though it is neither strictly individual nor in itself fully determinative of context.

The relation between the social agent and the world is not that between a subject (or a consciousness) and an object, but a relation of "ontological complicity" ... between habitus as the socially constituted principle of perception and appreciation, and the world which determines it. (Wacquant 1992: 20)

As I discussed in section 2.5.1.2, the discursive history of an individual bears the traces of the discourses associated with the social places which s/he has occupied. These form the representational experience and potential of the sign-maker.

In line with Kress, I see semiosis as based on 'interested action' and as 'transformative'. According to him, an adequate theory of semiosis is based on "a recognition of the interested action of socially located, culturally and historically formed individuals, as the remakers, the transformers, and the re-shapers of the representational resources available to them" (2000a: 155). This 'interested action' is "transformative rather than totally creative: that is, it is action on and with existing semiotic (cultural) resources. The more the sign-maker is in the culture, the more he or she is 'socialised' " (2000a: 156).

This view of the sign-maker as agentic and transformative places students very differently than does a theory of learning based on acculturation. The emphasis focuses on students' interests and motivations for the uses of particular forms, rather than on incompetence and error. This is important in looking at the students' textual

productions and helps to explain some of the genre conventions that they so interestingly 'break'. 'Breaking' or reinterpreting some standard generic conventions can signal an encounter of diverse knowledges and life worlds, but can also be a strategy for resistance. 'Hybridity' as such is inherent in all representation, but particular social circumstances create particular degrees of stability and durability for particular articulations, and particular potentials for articulating practices together in new ways (Chouliaraki and Fairclough 1999: 14).

The concept of 'practice' is ambiguous which is helpful in thinking about the relation between structure and agency. It is both a social action done in a particular time and place, and a habitual way of acting hardened into a relative permanency (Chouliaraki and Fairclough 1999: 21). This ambiguity points to the intermediate positioning of practices between the binaries of structure and agency. The fact that "any practice is overdetermined (simultaneously determined by others) means that outcomes are never entirely predictable and that resources for resistance are always likely to be generated" (Chouliaraki and Fairclough 1999: 25).

2.5.5.2 Conceptualizing a reciprocal curriculum

In order to transform academic practices, I argue for a 'reciprocal' curriculum where the resources that students bring with them are validated. Equity is not a matter of making concessions; it is "a matter of equality of cultural trade" (Kress 1996a: 18).

The starting point of a reciprocal curriculum would be

the situated selves of learners ... [in] a transformation that does not leave those selves behind in the fashion of assimilation, but which recognises and builds upon those selves, in their diversity and in the multilayered nature of each person's identity ... multiple languages and dialects; multiple community histories and life experiences, multiple intelligences, in sum, multiple ways of being human". (Kalantzis and Cope 2000: 147)

In a reciprocal curriculum diversity would be seen as a resource for students to draw on. A reciprocal curriculum would involve the utilization of available discourses, including those from students' life worlds. I argue that it is important to engage those discourses not only through textual reception, but also textual production, in order to engage a range of life experiences and competencies.

A reciprocal curriculum would not be the same as a 'responsive' curriculum, which is often construed as starting from where students are and moving on from there. For instance, Kenyon and Kenyon (1996) in looking at promoting 'literacies' for learners in South Africa, emphasize the importance of drawing on stories and poems from students' cultures in the teaching of science, thus starting from where the students are, rather than from where the teacher is. However, in doing this there is a danger of presupposing where students are and constructing everyone as the same. In the conception of a 'reciprocal curriculum', curriculum projects are not just a starting point for students, but a serious interrogation of students' representational resources in order to utilize these in curriculum design. This is the crux of my study.

Working within the framework of a reciprocal curriculum, the curriculum for the Communication Course in engineering is thought of as a social process, rather than a reified document. According to Cornbleth (1990), curriculum conceived of as a fixed plan encompasses an end-means view of learning, where curriculum is seen as the planned composite effort to guide learning toward predetermined learning outcomes. In this view, there is little room for student creativity that might lead to knowledge generation or reconstruction. Technocratic approaches simply cannot accommodate student-generated questions, hypotheses and interpretations. Cornbleth argues that knowledge and curriculum need to be conceived of as "contextualized social processes" (Cornbleth 1990: 12). Pedagogy is the mediation of the curriculum, emphasizing the social and the interpersonal.

2.5.5.3 Developing metalanguages

As mentioned previously, Hilary Janks (2000) has argued that access without design maintains and reifies dominant forms without considering how they can be transformed. Equally, design without access risks the newly designed remaining in the margins. Design involves

selecting the modes which the producer of the text judges to be most effective ... in relation to the purposes of the producer of the text, expectations about audiences, and the kinds of discourses to be articulated. (Kress and Van Leeuwen 2001: 31)

This can be done consciously or unconsciously. Conscious design involves becoming aware of the tacit habits of meaning-making choices. The process of taking greater

control over meaning-making involves making visible the representational resources that students are drawing on. This study explores what kinds of metalanguage could most usefully help to make visible the nature of the resources that the students are using. Metalanguages of “reflective generalization that describe the form, content and function of the discourses of practice” (NLG 1996: 86) are important in achieving conscious awareness of what is being learnt, and in surfacing to consciousness what is already known. Metalanguages need to be developed in order to reflect on ‘action’ - to move dialectically between practice and theory, between language use and language form. This concept of metalanguage is closely allied to Gee’s ‘meta-knowledge’ which is “seeing how the Discourses you have already got ... relate to those you are attempting to acquire, and how the ones you are trying to acquire relate to self and society” (1996: 141). A metalanguage is an index of discourse, “ways of verbalizing what you know in relation to other ways of knowing” (Thesen 2001: 143). In this sense, as Thesen argues, a metalanguage is also an index of cultural capital and identity.

In this chapter I have established the theoretical link between meaning, text and practice that underlies my research. I have highlighted the ideological nature of discursive practices and the privileging of certain academic practices, including ‘essayist literacy’, in tertiary education. In the data analysis chapters (chapters five to eight), I define these practices in more detail, look at what representational resources students bring to these practices, and examine questions of access to and transformation of these practices. First, however, in chapter three, I will describe the curriculum site of my study.

Chapter Three: Description of the curriculum site

3.1 The engineering foundation programme

The Communication Course is located in an academic development programme in a South African university's engineering faculty. This programme caters for students who matriculate from schools that have not prepared them adequately for tertiary study. The students on the programme are from academically disadvantaged backgrounds, notably, English additional language (EAL) students from ex-apartheid black schools. One of the aims of this programme is to increase the numbers of black engineers in the system. The courses that the students on this programme take are the same as those taken by the 'mainstream' students. The difference is that these students take fewer courses at first, so that they spread their degree over an extra year, and the programme tries to provide a supportive environment sensitive to students' academic needs. Students are placed in the programme based on their school-leaving grades and entry test points, and particularly their maths, science and english grades. In short, this is an extended curriculum programme which structures the students' learning experience by prolonging the period of study and by including academic literacy courses which are integrated into the content curriculum. Enrolment in the programme ranges between 80 and 110 students each year.

The students in the foundation programme are required to complete a year long credit-bearing course entitled 'Introduction to Communication'. When I took over the course six years ago, I had the freedom to choose the focal content and the methods of working with the students. In the context of outcomes based education (OBE) where outcomes are spelled out explicitly, the engineering faculty specified improved reading, writing and oral competencies as the desired outcomes for the course. These communication competencies are deemed important for success in the academic context as well as the profession of engineering. The Engineering Council of South Africa (ECSA) specifies that students need to "demonstrate competence to communicate effectively, both orally and in writing, with engineering audiences and the community at large" (2004: 6). There is an emphasis in engineering practice on documentation to support systems, such as progress reports, instructions, manuals, proposals, specifications and inspection reports. This documentation includes written text and technical drawings. Producing professional-looking text and professional-

looking graphics has become increasingly important for engineers (Beer and McMurrey 1997: 240). There is an increasing need for high level communication competencies due to flatter management structures and the greater complexity of engineering work (Johnston, Lee McGregor 1996). The texts and textual practices engaged with in the Communication Course are chosen in order to contribute to student achievement in the rest of their engineering programme.

The Communication Course was developed in the context of the diversity of students at historically white universities (as outlined in chapter 1, section 1.3), and state policy that is committed to increased access, post-apartheid redress, and equity in tertiary education. The course attempts to draw on and integrate diverse experiences, histories, and discourses, plus a range of modes of representation.

3.2 Resource backgrounds of the students

The students in the engineering foundation programme study different types of engineering: chemical, civil, electrical or mechanical. They are a diverse group in terms of languages, home countries, age differences, educational backgrounds, rural and urban origins. About one third of the group are women. Although diverse, there are also some similarities of experience within the group in terms of access to institutional discourses, non-identification with the institution, first year culture shock and distance from home. These students typically:

- are first year students, mostly from elsewhere in South Africa;
- entered university via an alternate access route with entrance criteria based on potential (identified in the alternative admissions tests) and not final school leaving grades;
- have English as a second or additional language (with a few exceptions).

Many of the students are from low income backgrounds. For example, in 2000 the students reported the following: 22,6% of the parents had no formal income at all (11,3% were unemployed, 8,8% self-employed, 2,5% pensioners). The low income brackets are important to bear in mind when thinking about students' access to cultural and economic resources.

Pedagogical approaches to teaching communication have to take into account the fact that South Africa is not a print-immersed environment, owing to high rates of poverty, illiteracy and differential access to economic and cultural resources (such as newspapers, books, letters, computers). Also, access to educational resources, such as textbooks and extra reading materials is limited. Baxen and Green (1999) studied the extent and nature of learning resources available in Grade 7 in the Western Cape in the fields of Natural Science, Language and Literacy, and Human and Social Sciences. Of the 26 classes they observed, only 13 had a textbook per child, in the other 13 classes learners had to share textbooks. This resource-impooverished situation impacts on what students read, how much they read, and attitudes to reading. Problems of access are even more serious with regard to computers. Most of the students had little experience of computers during their school years. This situation alters once they arrive at university, where they have access to a well-equipped faculty laboratory.

If these students are resource-poor in terms of access to printed materials, this does not seem to be the case with television. Each year I conduct a survey with the students. The information is gathered for the course development and is not directly part of my doctoral research. (I describe the survey in more detail in chapter four, section 4.5.4). In my survey of 80 students in 2000, 95% claimed to watch television at home, 81,3% watched videos at least once a month, whereas 45% went to the cinema regularly which is defined as once a month or more (20% had never been to the cinema, and 35% went once or twice a year). The reason for lower attendance at the cinema could be partly economic, and partly due to urban infrastructure and accessibility issues. The same lack of accessibility applies to art exhibitions. 60% of the students claimed never to have been to an art exhibition (interpreted in the largest sense to include photography and other cultural displays); 16,3% said they had been to one (usually since their arrival at the university); and 21,3% claim to have attended up to five art exhibitions. The results of this survey imply that television is one of the most accessible and powerful representational resources for establishing new and reconfigured interpretative communities in South Africa.

The students on the engineering foundation programme come from a wide diversity of backgrounds, yet have in common a disadvantaged schooling due to the policies of

the previous political dispensation in South Africa. Amongst the group, there is variable access to media resources, with visual media being the most widely used.

3.3 The Communication Course

Communication courses can often be met with resistance and decreased motivation by engineering students, due to the fact that the students often cannot see the relevance of learning what they perceive to be a set of decontextualized skills. Also, many do not see the necessity of improving their writing and language skills when their other courses, such as maths or physics, do not require this in any overt way. In order to address the above issues, I reconceptualised the Communication Course from decontextualized skills-based studies to a particular project, the rural village project, with designated roles for all students, including staged research processes. The idea behind the curriculum design is to set up a triangular relationship between the culture and discourses of academia, the workplace and students' primary discourses. The Communication Course is a year long, meeting for two hours each week.

Three key concepts are explored in different ways in the curriculum. They were selected because they are important in the context of engineering in South Africa (ECSA 2004: 6) and also because students have their own experiences of what these concepts may mean. These concepts are 'rural', 'landscape' and 'culture'. They are discussed with the students at key moments in the course.

3.3.1 The relative nature of 'rural'

In the Rural Village project, we work with notions of what the term 'rural' can mean and talk about the difficulties of defining a rural area. Rural/ urban seems to be a strong binary division in South African society. Even though relatively few students on the course reported coming from a rural area, the reality in South Africa is that many students move between rural and urban settings.

It is difficult to establish the parameters by which 'rural' can be defined. Researchers of 'ruralness' in the United States have either used intuitive idiosyncratic definitions or census standards (Childs and Melton 1983: 1). In South Africa both of these methods of definition are questionable as there is no general intuitive agreement and the census is problematic. According to the state's Rural Development Framework

(1997) which was developed by the rural development task team of the Reconstruction and Development Programme (RDP)¹, rural areas are defined as:

...sparsely populated areas in which people farm or depend on natural resources, including the villages and small towns that are dispersed through these areas. In addition, they include the large settlements in the former homelands, created by the apartheid removals, which depend for their survival on migratory labour. (1997: 2)

A feature of this definition is that it is 'not urban', which means the concept of 'rural' is defined by 'lack'. This view of 'rural' as 'lack' was the dominant one amongst the students, which was occasionally tempered by a nostalgic view, a hankering back to something pure, valued, and a sense of community.

In my surveys in 2000/2002, I asked the students whether they reside in a rural area and if so, why they would define that area as rural. The responses can roughly be divided into the following categories:

- Emphasis on 'lack'. Agriculture and cattle farming were mentioned as sources of income that distinguish rural areas from urban. However, this aspect of 'ruralness' was not overly emphasized in the responses; instead 'lack' was foregrounded, on many levels. Lack of infrastructure was specifically foregrounded: "Municipality is not responsible to bring services to the place"²; "It just had electricity in the past two years" and "Not all the roads are tar roads. The water supply is not good". 'Lack' was often couched in evaluative responses: "It has no night clubs, the life is dull and conservative".
- 'Non-western' nature of village. For example, "It is still developing and there are still mud houses".
- Location. For example, "It is far away from the city".
- Peoples' characters. For example, "People are disciplined".
- Social organization. For example, "There are no town-councillors. There is only a chief"; "old method of family are used".

The unclear boundaries between rural and urban are highlighted in the students' responses. For instance, one student who claimed to come from a rural area described

¹ The RDP is a social and political policy developed in 1994 by the newly elected African National Congress government with the aim of addressing inequities in South African society through sustainable development.

² When quoting from students' writing or interviews, I have not altered their grammar and spelling.

it as “a sort of township”. Two students from the same area, Umlazi in KwaZulu Natal, defined it differently, one classifying the area as rural, the other as urban. These discrepancies in definitions of ‘rural’ are highlighted starkly in the following two responses from students:

“Also sometimes we could finish a month without water. Electric failure. Outdoor toilets, coal cooking stove” (a description of Diphehli, Northern Province).

“It is still developing in a way, a shopping mall has just been built. It’s a semi-rural residential area” (a description of Daveyton, Gauteng).

In the latter quote, it is clear that the student is battling with a definition of ‘rural’, and opts for the concept ‘semi-rural’. Daveyton is not a rural area, but is very poor, and perhaps ‘ruralness’ and poverty are seen as synonymous.

The stereotypes and presuppositions attached to ‘rural’ in South Africa seem to be so strongly prevalent that some students, although describing themselves as ‘rural’, felt the need to define themselves against these stereotypes. Look at the following description of Ulundi, KwaZulu Natal: “It has no factories and firms and only one plaza but it is also a bit civilized”. Also, this description of Nqamakwe, Eastern Cape: “It is classified as a rural area, but the conditions we live under are better than those of rural areas”. Here the student feels compelled to reject presuppositions of what a rural area is like, and the judgements attendant on them.

Although the students’ definitions of ‘rural’ were contested and contradictory, there was also a strong communal sense of what rural South Africa looks like. The following features were mentioned repeatedly, creating a common sense of a general description. Herds of cattle, goats and sheep were mentioned (even if only as a rural ideal); poor power supply; poor water supply and sanitation systems (outside toilets, no kitchen and bathroom water); animal transportation; grass and mud, self-built housing; poor roads (mostly untarred); few shopping centres, schools, sports centres, hospitals, cultural centres; and poor access to advanced technologies. This description of rural South Africa from the students’ responses describes the features of poverty in South Africa. The rural development task team of the Reconstruction and Development Programme (RDP) in 1997 found that almost 75% of people below the poverty line in South Africa live in the rural areas. “The highly skewed distribution of incomes in South Africa goes hand in hand with highly inequitable literacy levels,

education, health and housing, and access to water and fuel” (Rural Development Framework 1997: 2).

The dire state of the rural areas partly stems from the long period of apartheid with its discriminatory policies and neglect of the majority black population. Forced removals led to over-population of the ‘reserves’ or former ‘homeland’ areas and deprivation of basic needs. Current land ownership and land development patterns strongly reflect the political and economic conditions of the apartheid era. The unequal structure of land ownership is one of the most important determinants of the existing highly inequitable distribution of rural income and wealth, as well as the post-apartheid move to the cities after ‘influx control’ was dropped. Landlessness and overcrowding in rural areas and inappropriate farming methods have given rise to severe soil erosion and land degradation. In addition, apartheid spatial planning created a rural landscape “devoid of economic opportunities for the disadvantaged majority, especially women; devoid of local markets and dependent on distant cities and towns for employment, goods and services” (Rural Development Framework 1997: 4).

I have discussed the state of the rural areas at length, since the notion of ‘rural’ is key to the Communication Course. The rural focus of the project provides a way of questioning stereotypes, legitimating diversity in the classroom, and engaging with some of the challenges facing South Africa at the moment.

3.3.2 ‘Landscape’: Nature and society

The second concept, ‘landscape’, is used both literally and metaphorically. As a metaphor, ‘landscape’ underlies both the curriculum, and my research. Any landscape is the result of human activity and is therefore always social and cultural. “The ‘scape’ in ‘landscape’ is related to the English word ‘shape’, and it is also related to the German word ‘schaffen’ – meaning both ‘to work’ and ‘to create’ ” (Kress 2002: 13). This concept of ‘landscape’ highlights the way in which culture and nature, symbolism and materiality, past and present are clearly intertwined. On the course, ‘landscape’ refers to the physical space or built environment (the setting for rural

villages), as well as to 'cultural landscapes' and 'communicational landscapes', where we make meaning from the resources available to us in that landscape.

Head discusses the meanings of the concept of 'cultural landscape'. The most common meaning of the term is that of 'landscape' as ecological artefact, that is earth conceived of as transformed by human action (Head 2000: 55). However, there has been a change in the World Heritage definition of cultural landscapes to include the category of 'associative cultural landscape' which has emerged in "recognition of the intangible dimensions of landscape, and interactions between the physical and the spiritual / symbolic" (Head 2000: 83). In my understanding, all landscapes are cultural, and the concept covers the visual and material, as well as the symbolic environment. Of particular relevance to the concerns of the Communication Course is the interaction between the physical, social and symbolic dimensions of 'landscape'.

People can inscribe themselves onto a landscape, and one of the ways of doing this is through selective memory. For example, in an interview with a student in 2001, the student spoke of the village the group had chosen for their research. He grew up in that village, and said that in reconstructing it for his peers, he constructed the village of his childhood, not the situation of the village as it is now. He mentioned the lack of electricity in the village, whereas the village is now fully electrified. This sense of 'invisible' landscapes is captured well in Italo Calvino's fictional writing, *Invisible Cities*, where he describes how memory transforms landscapes.

When a man rides a long time through wild regions he feels the desire for the city. Finally he comes to Isidora, a city where the buildings have spiral staircases encrusted with spiral seashells, where perfect telescopes and violins are made, where the foreigner hesitating between two women always encounters a third, where cockfights degenerate into bloody brawls among the bettors. He was thinking of all these things when he desired a city. Isidora, therefore, is the city of his dreams: with one difference. The dreamed-of city contained him as a young man; he arrives at Isidora in his old age. In the square there is the wall where the old men sit and watch the young go by; he is seated in a row with them. Desires are already memories. (Calvino 1979: 8)

Social actors organize their lives and experiences through stories and in doing so make sense of them (Coffey and Atkinson 1996: 68). Time and space are placed into a personal history, where the past is given meaning in the here and in the present.

3.3.3 Culture and practices

The construction of the concept of 'culture' in the course is not as a static, reified 'entity', linked to the nation state, or groups within that. Nor is 'culture' seen as the preserve of the elite (culture as opera, ballet and art) or the Other (cultures of rural or 'traditional' societies). The assumption underlying the course is that 'culture' is dynamic, always contested, and any 'practice' of culture involves some element of control, coercion or power. Foucault (1972) emphasizes that cultural practices are intrinsic to social power, and that social power exists in the rituals, practices and customs of everyday life and the ordinary. De Certeau (1998) emphasizes that these unnoticed practices are extremely powerful, and they ensure that people discipline themselves, and maintain notions of order and 'propriety'. In De Certeau's sense, 'culture' is seen as a set of practices. In Thornton's view (1988), 'culture' is defined as a set of resources from many different sources. He talks of contemporary 'understandings' of culture as emphasizing culture's creative power as much as its coercive power. He argues that contemporary cultural studies sees 'culture' as "contested yet creative, limiting but empowering, stable yet transformed and transforming, compromised yet valid, bounded but always transcending boundaries" (Thornton 2000: 44 – 45). Through discussions on symbolic objects and rural development, the course attempts to situate particular cultural practices within the broader systems of meaning and values that sustain them, and attempts to highlight cultural practices as complex sets of meaning that are in tension with each other.

With the strong force of globalization, it is important 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. It is important to draw on the knowledge traditions of indigenous and non-Western peoples to show other possible ways of thinking about 'landscape' and human-nature interactions. 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 not only the way we produce knowledge about the past, but also 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), have

written about the challenge for curriculum: how to acknowledge indigenous experience and expand on it. In thinking about rural development, 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 emphasizes drawing on cultural resources, looking at existing systems that work, enhancing and complementing these, rather than imposing something new.

3.4 Description of selected moments of the Communication Course

For the purpose of my doctoral research, I have selected elements of the course for analysis, including a 'Symbolic Object' project, and research in rural development. The texts I focus on in my analysis are produced from these moments and include the Symbolic Object projects, the investigative reports and the rural village posters. I will describe these moments in the sequence in which they appear in the academic year, as well as provide some background as to how the moments link in the course. A summary of the course is offered in appendix one.

3.4.1 Debates on development

The focus of the first quarter is on the theoretical concepts which underpin the course. We talk about 'appropriate technology' and sustainable development with assigned reading on these topics. To get the class engaged and to encourage practical application, we have a class debate entitled "To what extent is Intermediate Technology appropriate to the South African context?" Intermediate Technology falls somewhere between subsistence level and more advanced technologies. It is cost effective, uses local resources, is appropriate to its context, and grows organically out of community practices (Schumacher 1973, Sowman and Urquhart 1998). The debate turns around the question of the extent to which technical objects can have political qualities. At issue is the claim, as Winner describes it, "that the machines, structures, and systems of modern material culture can be accurately judged not only for their contributions to efficiency and productivity and their positive and negative environmental side effects, but also for the ways in which they can embody specific forms of power and authority" (1986: 19). Typically, some of the students' arguments centre on the advantages and disadvantages of 'going back' to 'traditional methods', and on the politics of Intermediate Technology (that it is 'second best' technology and

poor black South Africa will be 'kept under' whilst the richer echelons of society will be able to afford newer technologies).

The students have to write an argumentative essay with the same title as the debate: "To what extent is Intermediate Technology appropriate to the South African context?" The emphasis in this assignment is on presenting an argument through predicting and addressing counter-arguments. In the debate, and in the argumentative essays that arise in response to the debate, a number of common conceptual problems emerge. One is the perception that the 'South African context' is uniform and monolithic with few differentiations. Another is the understanding of culture as static and reified (you are either 'traditional' or 'western'). Also, an opposition is set up between 'tradition' and new technologies where the one replaces the other instead of leading to some kind of creative mix. A common cause for concern is the locus of power – who does what to whom? The frequent assumption is that Intermediate Technology is something imposed from the outside, from the government, and does not arise organically from the community itself.

3.4.2 Symbolic Object project

After the debate and the argumentative essay in the first quarter, we embark on the Symbolic Object project. I ask the students to think of some everyday objects in their communities that have symbolic meanings. Groups of students choose to focus on one of the objects identified by the class and think about how it functions as part of geographical, cultural and communicational landscapes. For example, a situation where someone may choose to have an electric stove or microwave in a place that has no electricity. Here the object has little 'functional' use, but has symbolic value, such as aspiration value. Students draw on their own experience of the object, and interview a range of people to glean their perceptions of it. They produce a text which discusses the physical characteristics and uses of the object, as well as the symbolic, social and cultural meanings people attach to it. Students are able to choose between predominantly written modes (such as an essay or report), or predominantly visual modes (such as posters, photos or video). They write a brief justification for their choice of mode of production and reflect on the relevance of the project for themselves as future engineers.

This project allows students to experiment with diverse resources in an unstructured curriculum space. It also allows them to bring experiential and cultural knowledge into the classroom, which serve as a springboard for thinking about development in more personal terms. This allows a much more personal angle to development, as affecting people's lives and homes, not just as some abstract exercise in engineering. (I discuss the Symbolic Object projects fully in Chapter 5.)

3.4.3 The Rural Village project

For the extended role-play in the Rural Village project, students apply for a job as consultant engineer and attend an interview. They have to research the existing situation in, needs and opportunities of the area they are to develop. Each team member then selects and researches an aspect of development such as appropriate housing, public transport provision, protection of water, appropriate power for domestic purposes, community projects and environmental issues. In planning these aspects of rural development, the students need to think about the suitability of technologies to local conditions, cost, and environmental protection. The team of students then makes a collective proposal for the development of the area. The problem-solving aspect of the course is emphasized by the Engineering Council of South Africa as a key aspect of the engineering degree. It involves analyzing and defining the problem and identifying the criteria for an acceptable solution; formulating, analyzing and evaluating possible approaches to solution of the problem; selecting and presenting the solution in an appropriate form (2004: 4).

When students form the teams to investigate a rural village, at least one team member needs to come from a village or have knowledge of a village. Reciprocity is set up as a principle in the groups. The person who has the knowledge of the village is to be used as a resource by the others. In this way, novice-expert relations are set up, where students exchange their mutual knowledges in an environment which values these. In the process, some notions of 'disadvantage' (including the connotations around 'ruralness') may be redefined in an environment of mutual respect.

Regular 'site meetings' are held throughout the course, and we spend some time talking through group work processes. Each team selects a facilitator and a scribe who records the minutes for all the meetings. In these processes, the professional roles are

emphasized and a sense of group responsibility fostered. Interestingly, in applying for a job on campus, one of the students stated on his Curriculum Vitae: 'facilitator of Mseleni Village project'. So, these roles are revealed as having some weight, even outside the confines of the course.

3.4.3.1 Needs Analysis

In the second quarter, the students investigate the existing situation in their particular village. In defining the specifics of an area, they are encouraged to be aware both of what systems people do already have in place, as much as what they need. The Needs Analysis is conceptualised as part of the larger research project. The idea is that the students' proposals for development will be stronger if firmly based on a thorough analysis of the existing situation.

In the first part of the assignment, students are required to research general conditions in rural South Africa related to their portfolio. This has a web-searching and a library research component. In the second part, students are required to describe the specific conditions of their particular village. This requires them to draw on the experiential knowledge of the team member that knows the village. Students need to define the area and give descriptions of the demographics of the region, the existing infrastructure of the community, the natural environment and the location in South Africa shown on a map drawn to an appropriate scale. The Needs Analysis thus makes two kinds of knowledge explicit to the students, research-based knowledge and experiential knowledge, and brings these kinds of knowledge together.

As a part of the Needs Analysis and in order to get students to begin to understand some of the complexities and politics around 'development', we undertake a role-play of a rural village site meeting. In the role-play, the students are all members of a village which has been targeted by a non-governmental organisation for environmental development. The different stakeholders in the meeting express their views on what their village needs with regard to a development programme. Each member has a stated agenda, but also a 'hidden' agenda (a view which they will not easily reveal in public). The different stakeholders are:

- local traditional leaders;

- local non-traditional political leaders;
- village women who collect firewood and forest products for household use;
- members of the village who utilise natural resources for crafts;
- stock and grain farmers.

The emphasis on the oral moment of a village meeting allows different kinds of experiences to be given expression in the classroom. According to De Certeau, orality constitutes the essential space of community. Social exchange demands “an entire hierarchy of complementary information necessary for interpreting a message that goes beyond a simple statement – rituals of address and greeting, chosen registers of expression, nuances added by intonation, facial movements” (1998: 252). One student really excelled not only as one of the elders of the village, but as the chief. He set up a call and response situation in the class, where after making a categorical statement, others in the class would call “Ewe Baba!” (meaning “yes, father”). In general, he was rather a fringe character, but this included him in the class in a central way. In fact, in subsequent sessions where he stood up to speak, the others responded by saying “Ewe Baba!”

As part of the Needs Analysis process in 2002, I organized a trip for to a local ecovillage development, Lyndoche at Spier Wine Estate. Ecovillages attempt to integrate a supportive social environment with a low-impact way of life. The ecovillage at Lyndoche is designed to be environmentally sustainable whilst providing quality housing for local workers on the wine farms. The central feature of the village is a community hall which doubles as a much needed venue for a government primary school. We looked at the innovative ventilation of this school, the brick-making machine and the sewage system. I organized this trip in order to root our discussions and the students’ research in a realistic sense of the issues at stake. Also, I was aware that although many of the students have links with rural areas, some have no ties at all. After our visit one student thanked me for organizing the trip, saying she had never been on a ‘farm’ before.

3.4.3.2 On-line investigative report

In the third term students are required to research suggestions for development based on their needs analysis in the second term. The research and report writing happens in an on-line environment which was devised collaboratively with Marion Walton and Fiona Wilson. The on-line component of the course is located in the computer laboratories and takes place during designated class time. It is designed to encourage maximum interaction, both between learners, and between learners and the lecturer. (The online course is discussed in more detail in Archer 2000; Archer, Walton and Wilson 2000; Walton, Archer 2003).

In the on-line component, the various stages of research are scaffolded, namely, formulating a research question, searching for information, sifting through information for relevance, analysing information and synthesizing ideas. One of the reasons for introducing the on-line component to the course four years ago was that students were relying heavily on information from the web, but were struggling to find the appropriate on-line sources for their research, and had difficulty in incorporating what they had found into their own writing without plagiarising. Now students are encouraged to be more critical of the information they find on the web. A writing consultant models the process by critiquing a number of web-sites, such as an engineering marketing communication site, a politically motivated document and a report on research from outside South Africa. The students are encouraged to interrogate the sources themselves in terms of who wrote the information, when the material was published, for whom it was written and for what purposes. This is vital in alerting students to the need to be critical of the sources of information and the relevance of information for their purposes.

We arrange on-line discussions between the students and geographically remote experts in the field of development. The aim of the discussions with the experts is to cross boundaries (including university, professional and disciplinary boundaries), and to build students' identities as researchers as well as professionals. The experts guide research, draw attention to overly ambitious projects, and point out gaps within research projects. These simultaneous conversations with geographically remote experts are an excellent exploitation of the opportunities offered by computer

mediated communication and they create a situation difficult to arrange under normal classroom circumstances.

Students look at the logic and coherence of their ideas through peer-editing. The peer-editors look at discrete sections of the report such as the synopsis, introduction, recommendations and conclusions, to see if these are internally coherent and if the different sections of the report articulate with each other. The on-line peer editing involves students inserting comments in their peers' reports which provides them with useful feedback at the final stage of their report writing. Reading with a view to editing emphasizes communal responsibility for writing quality reports within each team.

3.4.3.3 Poster presentations

The last phase of the course centres on poster production and oral presentations. The students produce a poster in their teams which summarises and presents their research on the village. Visual design and composition are emphasized, and students need to think about what kinds of visual, verbal and compositional choices are more appropriate for an academic audience (as opposed to a community audience). They are required to write an accompanying 'visual review' which outlines the visual choices they have made. These posters are presented at an end of year mini-conference to other students, lecturers, and invited guests. There are five venues with simultaneous presentations, and a general plenary, poster viewing and prize giving at the end. This is followed by drinks and snacks, and serves as a farewell party for the students as well. The posters are judged by the communication lecturers and members of the engineering faculty, according to their visual design as well as the plausibility and innovation of their proposals for rural development.

3.5 Final comments

The Communication Course attempts to engage with clearly defined tasks of interest to the students within a meaningful curriculum. The content of the Communication Course has thematic coherence in terms of the work that an engineer in a developing country would need to do. The course aims to bring aspiring engineers to a reflexive consciousness of the contexts and consequences of their practice. This is in line with Engineering Council of South Africa stipulation that students need to be critically

aware of the impact of engineering activity on the social, industrial and physical environment” (ECSA 2004: 6).

The texts I will be focusing on in my analysis are the Symbolic Object projects, the investigative reports, and the rural village posters. These texts provide a forum where students can begin to learn the discourse of engineering – rationality, classification, cause and effect relations, sophisticated forms of problem-solving and judgement. The Symbolic Object projects, the written reports and the posters are modally rich texts as compared to, for example, the more monomodal argumentative essay. The Symbolic Object project occurs at the beginning of the course and is well-positioned for me to explore the representational resources that students bring with them to the university. These texts are also produced in an unstructured and informal curriculum space, and are less regulated, whereas the reports and the posters are highly regulated genres. In the next chapter, I describe how I analyze these texts in order to answer my research questions.

Chapter Four: Research Design and Methodology

4.1 Overview of chapter

This research focuses on texts and representational resources, rather than on pedagogy. It examines multimodal ways of addressing the unequal discourse resources within the university and within the social environments from which the university draws its economically and culturally diverse student body.

The chapter provides an overview of the research methodology and outlines the key ethical considerations for this study. It then provides detail on the methods of data collection, including: collecting textual products, conducting interviews, collecting students' written reflections and administering questionnaires. The second part of the chapter describes the method of data analysis, namely social semiotic multimodal textual analysis, and presents a framework for identifying students' representational resources. In describing the framework, the aim is to show how the theoretical concepts outlined in chapter two are operationalized in this particular research context.

4.2 Overview of research methodology

All research has political implications and cognisance needs to be taken of the political and ideological contexts of educational research. Educational research is not a neutral activity, but rather involves engaging in a politics of knowing and being known, where power is never absent (Cohen et al 2000; Titscher et al 2000). Ontological assumptions give rise to epistemological assumptions, from which methodological considerations, instruments of data collection and analysis are developed. In other words, 'methods' are explicitly or implicitly related to theoretical assumptions. Epistemology is concerned with that which "distinguishes different kinds of knowledge claims". Ontology, on the other hand, is about "what exists, what is the nature of the world, what is reality" (Usher 1996: 11).

Broadly speaking, the agenda underlying my research is about facilitating student access to the engineering curriculum and contributing to the development of a pedagogy of diversity that utilizes rather than ignores or devalues diverse

subjectivities. I hope to contribute to the transformation of tertiary curricula in South Africa, in a climate of social redress. In this sense, my project fits within the 'critical' research paradigm most commonly associated with Habermas (1972). In this paradigm, the intention of research is transformative; not merely to understand society, behaviour and phenomena, but to change them (Cohen et al 2000). My research project also sees the relation between power and discourse as integral, as does a critical approach. However, my view of ideology is less monolithic than that of a critical paradigm. Because a critical paradigm aims to uncover interests at work in a situation and interrogate the legitimacy of those interests in terms of equality and democracy, this paradigm can, at times, be too prescriptive, reducing a sense of the complexity of socio-historical contexts in which knowledge is constructed. According to Widdowson (1995), critical discourse analysis is a biased interpretation, prejudiced on the base of some ideological commitment. My project differs from critical discourse analysis which tends to emphasize critical reading and deconstruction across a range of modalities (Fairclough 1989, 1992a, 1995a), and rather emphasises 'design', focusing on multimodal production and reconstruction.

My epistemological orientation is interpretive and post-positivist. Scott and Usher argue that positivism can be summed up in three propositions: "first, that reality is self-evidently available; second that science is free of its own cultural confusions; and third, that knowledge is produced by means of immutable methods" (1996: 177). In contrast to positivism, I see research as interpretation, in which history and socio-cultural location are inseparable from subjectivity. My emphasis is on the recognition and utilization of difference, complexity and heterogeneity, rather than on a search for universal laws that regulate human behaviour. Knowledge is viewed as subjective - it is partly based on experience and insight of a unique and personal nature, and partly socially constituted. According to Cameron et al, researchers cannot help being socially located persons: "We inevitably bring our biographies and our subjectivities to every stage of the research process, and this influences the questions we ask and the ways in which we try to find answers" (1992: 5).

This research comprises an examination of a particular curriculum which is bounded in time and place, namely the Communication Course which I have been teaching since 1998. As the research site is also my teaching site, this means that I was both

researcher of and participant in the classroom processes. There were certain tensions involved in this. At times, the role of researcher seemed in contradiction to the role of teacher. In my role as teacher my interaction with students is generally guided by educational aims, and led by the students' needs and interests. I was concerned that 'being a researcher' would have unpleasant overtones for students, making me appear dispassionate and disinterested, taking a spuriously objectivist view of them and their texts, transforming them into 'data'. I therefore attempted to make the research process as empowering as possible from the student point of view, and to be as explicit about my own role as possible. This is in line with Clifford Geertz's (1973) work which opened the way for what has been termed a dialogic anthropology in which researchers consciously attempt to locate themselves in the texts which they produce. (The ethical considerations are discussed in section 4.3).

In this study I attempt to suspend 'teacherly' judgement and look at texts free of a norm-driven, evaluative eye. I put learning and the formal curriculum aside in order to do textual analysis, and look at the ways in which traces of students' lives manifest in texts. Interestingly, putting the formal curriculum aside is more difficult when looking at the written mode, and less difficult when looking at the visual modes. This is probably because I am used to assessing writing, whereas assessable tasks comprising the visual are less common. Perhaps new multimodal text types disable the habitus of the teacher, thus enabling him/her to look at things afresh.

4.3 Ethical considerations

Ethics and epistemology are inextricably linked. Ethics need to be viewed in terms of processes and as a component of one's view of the relation between knower (researcher) and 'subject', and all the power issues inherent in that relation. In other words, in looking at ethical issues, one needs to examine what knowledge is, how it is constituted and socially constructed, and the power dynamics in its constitution: "the politics of knowing and being known where power is never absent" (Usher and Scott 1996: 180). The interplay of power and knowledge pose obvious dilemmas for the critical social scientist. For instance, knowledge in the form of generalisations requires a closure that necessarily needs to be imposed; it is not something that exists in 'reality'. Along with Cameron et al, I follow Foucault in understanding power as a "multiple relation and not something that has a single source, in emphasising power's

connection with knowledge and 'regimes of truth', and in recognising the links between power and resistance" (Cameron et al 1992: 20). The advantage of seeing power in these complex and contextual terms when studying access to academic practices is that there is no longer a need to identify a static group of powerless people.

Research is the production of text and since the "representation is itself affected by the form of the representational system, the research text cannot be simply a faithful representation of a reality outside the text" (Usher 1996: 43). Scott and Usher take these views on the textuality of research a little further and claim that "the very way in which research texts are constructed and presented as orderly, coherent and logical, ensures that the researched are always objectified (and hence deprived of a voice) whatever the emancipatory intentions of the researcher" (1996: 177). However, it is possible to counteract this textual objectification to some extent by being aware of the kind of results produced. A research text can be more or less transparent in the degree to which it is reflexive in focusing on the way it has been constructed. In my study, it appears ethical to produce a more dialogic account, where the dominant voice of the researcher does not overwhelm the voices of the participants in the research. In producing the textual product I have tried to present students' perspectives and opinions in their own voices by including extracts from interviews and students' writing, and have attempted to foreground the fact that my analysis is from a particular perspective.

Since a 'code of ethics' has been criticized as fitting into a positivist framework (see Cameron et al 1992), I have not developed one in that sense. However, the 'ethical guidelines' that I followed for this research are worth mentioning:

- The researcher should reveal her identity and background as fully as possible to the students and staff on the Engineering Foundation Programme.
- The purpose and procedures of the research should be explained as far as possible to the students.
- Informed consent should be gained from all participants (in writing).

- Students should have the right to refuse to take part in the study.
- The dignity, privacy and interests of the students should be respected. Subsequent privacy and anonymity of the students after the research is completed should be guaranteed.
- The study should refrain from reifying people into immutable things, and recognise the transformability of social reality.
- The study should produce dialogic accounts, self-conscious in their construction and representation of researcher and researched.
- The study should benefit the current students in that they get a chance to reflect on their learning in a metacognitive way through interviews and written reflections.
- The study should benefit future students in the course through improved curriculum design.

4.4. The students in the study

From the larger student sample, I have chosen to focus on the textual productions of ten students from 2002. I chose a set of students with a range of ability (according to the marks they obtained on the course). Three out of the ten students are women, which is a fairly representative ratio of men to women in the class as a whole. The students represent a diverse group in terms of language, place of origin and age. All of them speak English as an additional language, with Zulu being the most commonly spoken mother tongue in the group. None of the students are from the area where the university is based, but are from a number of different regions in South Africa. The age range is from 16 to 22 years. The following table summarizes their autobiographical details. The names have been changed, in line with the principle of anonymity outlined in the ethical considerations mentioned above.

Student Name	Home language	Gender	Area	Age
Mbongiseni	Ndebele	Male	Mpumalanga	19
Mthoko	Sepedi	Male	Limpopo Province	22
Thabang	South Sotho	Male	Free State	18
Andrew	Zulu	Male	KwaZulu Natal	18
Victor	Zulu	Male	KwaZulu Natal	18
Dizu	Zulu	Male	KwaZulu Natal	18
Phillip	Xhosa	Male	Eastern Province	18
Nandi	Zulu	Female	KwaZulu Natal	16
Zodwa	Xhosa	Female	KwaZulu Natal	18
Tumi	Zulu	Female	KwaZulu Natal	18

Table 1: Autobiographical details of students in the study

Since all of the students have English as an additional language, it is worth providing a brief profile characterizing the features of this English. Linguistically EAL speakers have different resources to mother tongue speakers of English. De Klerk and Gough (2002) give a summary of the features of 'black South African English' (BSAE) which they define as the variety of English used by mother tongue speakers of South Africa's indigenous African languages. These features include:

- using uncountable nouns as countable;
- omitting articles;
- replicating the subject through the pronoun (for example, "The younger generations ... they are moving away from those things");
- confusing gender in pronouns;
- extending the progressive form (for example, "The toilets that are existing are just enough");
- simplifying tense;
- retaining question order in reported questions;
- using idiosyncratic patterns of complementation (for example, "The thing that made me to know rural areas").

In this study I quote verbatim from students' texts, which means that I leave the students' grammar and spelling in the original.

4.5 Methods of data collection

In order to address my research questions, I focus on identifying and describing students' representational resources. The description of resources is accompanied by a social semiotic analysis of these resources and of the modes and media of representation through which they were realized. In this way, both representational resources and processes are shown to be of interest.

My methods of data collection include: students' textual productions, interviews, questionnaires and students' written reflections. Although I collected data from these different sources, I did not draw on all the data equally in my analysis. The data have been collected over a period of three years (from 2000 to 2002). Most of the data used in this study are, however, from 2002. I use the interview data from 2000 and 2001 on a number of occasions, normally to provide contextual information.

4.5.1 Students' textual productions

The main data for this study are the multimodal textual products which the students produce in the course, both in groups and individually. There are three types of textual production.

- The Symbolic Object project comprising a range of genres and modes. The objects represented are everyday items which the students identify as carrying symbolic value. In this study I examine three posters that three groups of students produce about objects regarded as symbolic: flowers, goats and trousers / pants (specifically on women). (See chapter five for this discussion.)
- A written report investigating one aspect of rural development. My analysis focuses on the reports produced by the three groups of students who are the focus of my study. (See chapter six.)
- An academic poster reporting on the research of the group as a whole. I focus on three posters which are named after the researched village: Nobody Village poster, Efolweni Village poster, Ingogo Village poster. (See chapter seven.)

These texts were chosen as exemplars of unregulated and regulated genres. The Symbolic Object projects comprised less regulated genres produced in an informal curriculum space, whereas the investigative reports and the rural village posters were

highly regulated in terms of the genre requirements of the discipline. These texts were selected for their modal richness as they encompass both written and visual modes.

The range of genres is important in answering my second research question: “How do student utilise and adapt representational resources from the larger semiotic landscape in the reception and production of a range of genres within academic conventions?”

The texts were distributed evenly across the course. The Symbolic Object project occurs at the beginning of the course, the reports in the middle, and the poster at the end. Because the Symbolic Object project takes place at the beginning of the year and within a less regulated curriculum space, it is well-positioned to enable me to identify students’ primary discourses and different kinds of secondary discourses and resources, before these resources become negotiated with the expectations of the academy and the engineering discipline.

In sum, I focus my analysis on 12 texts: three Symbolic Object posters, six written reports, three rural village posters. The following table shows the names of the students and the textual groupings.

Symbolic Object poster (Group produced)	Written reports (Individually produced)	Rural Village poster (Group produced)	Students
Flowers poster	Reports on Nobody Village	Nobody Village Poster	Mbongiseni Mthoko Thabang
Goat poster	Reports on Efolweni Village	Efolweni Village Poster	Andrew Victor ⁶ Dizu
Pants on Women poster	Reports on Ingogo Village	Ingogo Village Poster	Phillip Nandi Zodwa Tumi

Table 2: Textual groupings of students

4.5.2 Interviews with students

Doing textual analysis to identify students’ representational resources foregrounds my interpretations, rather than the students’ perceptions or views. However, Thesen and

⁶ Victor was a part of the Symbolic Object group, but joined a different group for the rural village project.

others have raised questions about discourse analysis and have criticised social semioticians' work as being overly textually-based, in which researchers "read values in silent texts" (1999: 8). The interviews were a way of including the students' perspectives. It is clear that texts realize the significant features of the social environment in which they were formed, and what counts as data for the process of meaning-making is both the text that is produced and the students' verbal commentary accompanying it. An interview emphasizes the centrality of human interaction for knowledge production and the social situatedness of research data (Cohen et al 2000: 267).

I interviewed the ten students who are the focus of my study. The individual interviews focused on their productions in order to complement my analysis of the textual products. I use the interview data particularly to supplement my analysis of the Symbolic Object projects, where the students are drawing on both cultural and personal knowledge. Each year I interview students about their experience of the course, and I occasionally quote from these interviews from previous years, although they are not a systematic part of my analysis.

Interviews allow participants to discuss their interpretations of the world and to express how they regard situations. However, I am also aware that interviews take place within discourse constraints, produced by the artificial social situation of the interview, and the inherent power dynamics between interviewer and interviewed. For the interviews, I prepared a set of questions that covered the same topics with all respondents. However, these were semi-structured interviews, open-ended, conversational and flexible, where I was free to modify the sequence of questions, explain them, or add to them. Silverman (1993 in Cohen et al 2000: 121) argues for the importance of open-ended interviews, as they enable respondents to introduce topics and to demonstrate their unique way of looking at the world.

4.5.3 Students' written reflections

As part of the Symbolic Object project, students were required to write a reflective piece on their chosen object and their textual productions, justifying their choice of mode and media of representational and reflecting on what these choices afforded.

mode and media of representational and reflecting on what these choices afforded. Part of this reflection was consideration of the relevance of the project for them, both in the curriculum and in the engineering workplace.

4.5.4 Questionnaires

Each year I do a survey with the students. I have used this survey to inform my research, but not as part of the research design process. The function of the survey is to identify broad patterns of media usage and production. The focus is on media influences and students' reported experience in the production and reception of a range of genres. The survey also focuses on the students' perceptions of and attitudes to 'home'. The semi-structured questionnaire includes closed (numerical) questions, open questions (multiple choice and rating scales), and questions which invite students to compose longer responses. (See Appendix two for the questionnaire.) I do not see the survey responses as 'fact', but rather as opinions and texts - what students choose to represent about themselves. The responses given to the surveys were explored further in interviews with the ten students in the three focal groups.

4.6 Analysis of data

I focus my analysis on students' textual products, rather than on the interviews, written reflections and questionnaires. These are used to supplement, contextualize, enhance or nuance the analysis of students' texts. My primary focus is on the representational resources themselves, and whilst students' perceptions of resources are important, they are of secondary importance in my analysis.

4.6.1 Social semiotic multimodal analysis of students' textual productions

Social semiotic multimodal textual analysis (Jewitt and Oyama 2001, Kress and Van Leeuwen 1996, Stein 2000) is used in this study as the main method of data analysis to illuminate engagement with texts and practices. As argued in chapter two (section 2.4) texts are seen as sites of struggle over discourse, meaning, subjectivities and power, and are therefore crucial in investigating access to academic practices. The main units of analysis in this study are the students' textual productions. 'Text' can be tied down to the 'communication event', the temporality of which sets boundaries for the analysis.

A limitation of social semiotic analysis is that it seems to work best with small elements or signs. When the aims of research shift to higher level relations in process and to looking at aspects such as institutional values, the social semiotic approach may be limited (Kress 2000). As mentioned earlier, a recurring criticism of social semiotics and other approaches such as critical discourse analysis is that they are overly textually-based approaches. These approaches are often largely unconcerned with the workings of broader patterns of social reality (Widdowson 1995, Harvey 1992). A textually-based approach risks being essentialist through reading a meaning off a text and reifying it. This approach also risks separating out and reifying the different modes in a text. As I argued in chapter two (section 2.3), I do not see text as a cultural artefact, an object to be taken apart, interpreted and reassembled, but as an unfolding and contingent process. A social semiotic analysis focuses on “the relationship among texts, social contexts, and the social practices language and other modes realise” (Stein 2000: 334). Rather than seeing the meaning of the text as divisible into a number of separate semiotic modes, I look at how the interactions of modes make meaning within particular texts and contexts.

The data collected and used to answer my research questions are outlined in the following table:

Research Question	Data Source	Method of Data Analysis
How do students utilize and adapt the representational resources from the larger semiotic landscape in the reception and production of a range of genres?	<ul style="list-style-type: none"> • Students’ texts • Interviews • Students’ written reflections on their texts 	A social semiotic analysis of students’ texts, complemented with data from other sources.
How do students utilise and adapt these representational resources from the larger semiotic landscape in the reception and production of a range of genres within academic conventions?	Students’ Texts: <ul style="list-style-type: none"> • Symbolic Object Projects • Investigative Reports • Rural Village Posters 	Social semiotic analysis of the transformation of students’ resources across unregulated genres and regulated genres in the discipline of engineering.
How can these representational resources be drawn on in curriculum design in tertiary education to develop a pedagogy of diversity and unity?		The implications for curriculum design are proposed, based on the analysis of the data.

Table 3: The relationship between the research questions and data

4.6.2 Framework for identifying students' representational resources

I will now look at the framework of analysis employed for identifying students' representational resources in multimodal texts, focusing on the ways in which the first year engineering students' semiotic resources of communication are used in communicative practices in a range of genres.

Key to my framework for analysis is the notion of design as outlined in chapter two. Design requires the "choice of materials and modes which for reasons of cultural history, are best able to (co-)articulate the discourses in play at the particular moment" (Kress and Van Leeuwen 2001: 31). Design organises the realisational modes of discourses. Modes used as resources for design "have cultural articulation through their histories of social use, and these articulations mean that the elements of the modes, and the combinations in which they appear, have a (relative) stability. Design has to work with and against that stability" (Kress and Van Leeuwen 2001: 62). Designing is thus active, agentive, yet also hedged by rules, constraints and conventionalised practices. The genres and discourses are the shaping which provides the frames. For example, in the process of design the constraints of a genre or discourse can be worked against. This focus on the "poles of constraint and creativity" (Kress and Van Leeuwen 2002) of genres and discourses is a useful way of looking at the textual representations of the students.

The categories in the framework for identifying students' representational resources are largely drawn from Kress and Van Leeuwen's *Reading Images. The Grammar of Visual Design* (1996), which is based on Hallidayan grammar. Others in the systemic functional linguistic movement have also used Hallidayan grammar in this way, such as Jewitt and Oyama (2001) and Stein (2003). Hallidayan analysis is extremely apt for speech and writing as modes, providing useful concepts for the visual mode as well. In looking at multimodal texts like the students' posters, I need a common language to talk of signs in general, entities apt for the mode, without having to switch from linguistic to mode-specific terms. Any text involves a multiplicity of signifying systems, and Halliday's three metafunctions (ideational, interpersonal and textual) can apply to all modes. I do not import the linguistic into the visual, but draw on the homology between the linguistic and the visual developed in *Reading Images*.

My framework for analysis is a way of interrogating text; a way of looking at multimodal texts in order to ask questions about students' representational resources (see table 4 below). Any text involves a multiplicity of signifying systems.

Composition, genre, mode and medium are semiotic resources available to the makers of the text. The first three categories in the framework (Coding Orientation, Discourse, Ways of Organizing Knowledge) are the main categories. They describe the order of a specific world and the resources used to represent that world.

Before discussing these categories in more detail, I would like to show how they are mapped onto a Hallidayan framework. The configuration of discourses (which are represented in particular coding orientations and organized in particular ways) constitutes the ideational. The interpersonal metafunction is concerned with social-dialogic interaction and is realized through genre (the ways of organizing the mode in terms of the social relations of the participants) and modality. Modality refers to the shared truth value of a representation. It thus functions as the 'interpersonal', since what one social group considers as having high modality may not be considered credible by another. Modality both "realizes and produces social affinity" (Kress and Van Leeuwen 1996: 176) through aligning the viewer/reader with the forms of representation with which the text producer aligns himself or herself. The textual metafunction is concerned with principles of structure and is realized through composition and cohesion (what is foregrounded and backgrounded). Mode and medium are categories which are part of a multimodal semiotics, and apply across all of Halliday's three metafunctions. Similarly, the provenance of design elements is an aspect of all modes.

Metafunction of Text	Semiotic Resources	Description	Operationalized
Ideational (Representing a world outside the representation system)	Coding Orientation	Sets of abstract principles which inform the way in which texts are coded by specific social groups, or within specific institutional contexts (Kress and Van Leeuwen 1996: 170).	For example, technological, sensory, abstract, naturalistic, social realism.
	Discourse	“Discourses are socially constructed knowledges of (some aspect of) reality” which give expression to the meanings and values of an institution or social grouping (Kress and Van Leeuwen 2001: 4). They are inextricably linked to value systems in particular contexts and are sometimes opposing and contradictory.	For example, gender discourse, academic discourse.
	Ways of organizing knowledge	Relations between entities (represented people, places, things and ideas) including process types. Patterns representing the encoding of experiential meanings.	Conceptual frameworks (analytical hierarchies; classification processes; binaries) Narrative processes (change from one state to another; binaries) Logic (syntagmatic or paradigmatic)
Interpersonal (Relations between producer and audience)	Knowledge of and use of Genre	The category which “realizes the social relations of the participants involved in the text as interaction” (Kress 2002: 114). In the academic context each discipline and course presents students with: appropriate knowledge, appropriate ways of organizing that knowledge and appropriate ways of representing social relations between the writer and reader (Kress 1982: 123).	Identifiable genre ‘types’ students are drawing on Represented Social Relations between Participants Authorial voice (personal or distanced)
	Modality	The produced shared truth value or credibility of a representation which is represented and realized through various means.	Modality (in visual text): truth value within a particular coding orientation Modality (in written text): signals the distance proper to hypothetical statements
Textual (Processes of ‘Design’)	Composition	Composition relates the representational and interactive meanings of the image through information value, salience and framing.	‘Directionality’ of vectors Salience (through size, foreground, colour, spatial positioning) Framing (through spatial positioning) Relation between words and images

	Use of Modes	Mode is the means for realizing text, the culturally shaped representational material available for representation (e.g. spoken language).	Visual (types of images) Writing (use of home language as a resource; slang) Speech (use of home language as a resource; slang) Colour (modality, values on a range of scales) Typography (font, size, word-processed or hand-written, positioning in text)
	Use of media	Media are the material resources used in the production of semiotic products and events, both the tools and materials used (e.g. radio).	Tools: Inscriptional media Materials: Medium of production

Table 4: Framework for identifying students' representational resources in textual productions

Now I will describe and discuss each of the categories in more detail.

4.6.2.1 Coding orientation

Coding orientation is defined by resources being repeatedly used in certain ways, establishing expectations which are habitualized over time. Representation grows out of a particular life world, thus coding orientation is a semiotic view of life world. Kress and Van Leeuwen, drawing on Bernstein (1981), define coding orientation as “sets of abstract principles which inform the way in which texts are coded by specific social groups, or within specific institutional contexts” (1996: 170). Different domains, such as the domains of Engineering and tertiary education in general, have particular realizations in different coding orientations. For instance, these domains encompass distinct notions of the abstract and the concrete, the generalizable and the particular. Different coding orientations make different validity claims with respect to the truthfulness or degree of correspondence to reality in everyday perception. The concept of coding orientation helps to identify the different domains in the students' texts and their semiotic realization. Because coding orientation is about habitualized forms of practice, it is a category which combines the discursive and the generic. The category of coding orientation thus performs a different analytical function to that of discourse.

I use the notion of coding orientation as an analytical tool in my analysis of students' texts. In a technological coding orientation, the dominant principle is the effectiveness

of the visual representation as a 'blueprint'. Sensory coding orientation is used where the pleasure principle is allowed to be dominant, such as in art, advertising, fashion, cooking, interior decoration. Here colour is a source of pleasure and affective meaning, and consequently it conveys high modality. Abstract coding orientation is used by socio-cultural elites. In such contexts modality is higher the more an image reduces the individual to the general, and the concrete to its essential qualities.

The 'everyday' can either be realized through naturalistic coding orientation or social realism. Because coding orientation encodes the ways in which a community engages with the world, it is a particularly useful category when theorizing realism as a social construct. Naturalistic coding orientation is about the construction of the 'natural' and remains the dominant one for representation of our society. It is the common sense code which all people share when they are being addressed as 'members of our culture'. In naturalistic coding orientation, colour and other features are deemed to correspond closely to our everyday perception of the world under normal conditions. The everyday can also be realized through social realism which has provenance in the domain of literary theory. The attempt is to represent society 'the way it is'. However, naturalistic coding orientation and social realism are closely linked. When the social is represented through the natural, this leads to 'naturalization'. In other words, when the social is seen as natural, this is construed as 'human nature'.

Different coding orientations can appear in one text, although one orientation will usually be more dominant with some traces of others present. A particular coding orientation thus allows a multiplicity of possible modality configurations. Also, an image can be abstract in respect to one modality marker, naturalistic in respect to another and sensory in respect to yet another.

4.6.2.2 Discourse

In my analysis of students' texts, I identify discourses utilized, discourses evoked (provenance) and discourses referred to (intertextuality) in the organization of content. In this analysis, I recognize that none of these exist in isolation, but within larger systems of sometimes different, contradictory or even opposing discourses. I also recognize that a discourse can be expressed in a number of modes or ensembles of modes.

I concentrate on Western scientific academic discourse and students' mimicry, appropriation and transformation thereof. I also identify primary discourses and other emerging secondary discourses. Defining academic discourse and the ways in which this is regulated enables me to examine how students grapple with it, but also how they insert their own voice and identity into their texts. Agency in scientific discourse (degrees of authorial distance from the subject matter) and affect (degrees of engagement and degrees of evaluation) are of interest.

4.6.2.3 Ways of organizing knowledge

Discourses are realized through particular ways of organizing knowledge - in conceptual frameworks and narrative processes. In analyzing ways of organizing knowledge, I look at relations between entities, namely represented people, places, things and ideas. I identify the way in which patterns encode experiential meanings. The underlying way of organizing knowledge in textual representation can be either narrative or conceptual. Narrative patterns have participants and vectors of action; they "serve to present unfolding actions and events, processes of change" (Kress and Van Leeuwen 1996: 56). Conceptual patterns represent participants in terms of their classification, their analytical and symbolic processes their generalized states of being. It is possible to classify without hierarchical relationships, according to taxonomic relationships. I also identify the specific logic underlying the students' texts. In syntagmatic logic meaning is derived from the sequence of and connection between elements in a linear text. The sentence or written line is a perfect example of syntagmatic logic where the words as signs only have meaning in relation to each other. On the other hand, in paradigmatic logic, more of the meaning is placed in the individual elements of the composition, for example, a visual text that represents the characteristics of a particular species.

4.6.2.4 Knowledge of and use of genre

I use the category of genre to describe the "social relations of the participants in the making, the reception and the reading / interpretation of the text" (Kress 2002: 100). In this definition, genre is not necessarily tied to temporality or sequencing. Social relations could, for example, be expressed through factors that focus on aspects of power (Kress 2003: 96). I look at the social relations between participants which are

realized in the text - those which are reported, those which are implied, and those which are represented. So, for instance, I look at the ways in which audience is constructed (as insider or outsider to the represented practice), and the way in which certain subjects are represented, like the villagers.

Although genre is about conventions at work in a domain of practice, it is important to bear in mind that there is a constant tension between convention and change. This is the effect of the “constantly transformative action of people acting in ever changing circumstances” (Kress 2003: 102). I analyze mixed forms in order to understand the encounter between students’ resources (the forms that students bring with them) and the generic forms of the engineering discipline, for instance, students’ experiences of the reception and production of posters in their communities and how these influences feed into the academic posters they are required to produce on the course. I also look at the generic features students draw on in producing less regulated texts, such as those produced in the Symbolic Object projects. The genres I concentrate on are the investigative report and the academic poster. The generic features I highlight for my analysis include narrative (which relies on a temporal ordering of principles), argument, classification and description.

4.6.2.5 Modality

Modality is the produced shared truth value or credibility of a representation which is realized through various means. Modality is closely linked to coding orientation. When one talks about modality in a visual text, what one is looking at is the truth value within a particular coding orientation. In a naturalistic coding orientation, truth is associated with naturalism. In science, abstract and decontextualized representations often convey a truth within an abstract coding orientation. According to Kress and Van Leeuwen (1996), truth and reality are constructed visually through markers of modality such as colour saturation, colour differentiation, colour modulation, contextualization, depth, brightness. Modality in written text signals the distance proper to hypothetical statements. In academic discourse, tentative modality is often the norm and words such as ‘could’ are frequently used in statements such as “it could be argued that”. I am aware that it is problematic to look at modality in terms of mother tongue competence when examining these students’ writing. All of these students have English as an additional language and some are more fluent than others.

This is important when doing textual analysis as one cannot be sure of the significance of students' linguistic choices. However, one could equally argue that it would be problematic to analyse the modality of a drawing done by someone who is not artistically inclined. The concept of 'design' as used in this study covers the sign-maker's conscious and unconscious choices, within the constraints of ability.

4.6.2.6 Composition

Although composition is not necessarily a mode-specific category in this research, I use it as a category of analysis of texts that are mainly visual. Composition gives textual order to the world projected by the text. More specifically, composition relates the representational and interactive meanings of the image through information value, salience and framing. It includes aspects such as the directionality of vectors, framing of key elements in the representation and the relation between words and images. Salience can be conveyed through size, foregrounding and colour. Left and right positionings are also important considerations. Kress and Van Leeuwen argue that what is placed on the left in 'Western' culture is often represented as the 'given' and that on the right as the 'new' (something not yet known, something perhaps not yet agreed on by the viewer and possibly contestable). In looking at composition, I am focusing on the way in which spatial disposition is used as a resource for making meaning, and this may not necessarily be similar to a 'Western' semiotic.

4.6.2.7 Use of modes and media

Mode is the 'stuff' of representation, the means for realizing text. The modes that I concentrate on in my analysis are visual (including types of images, colour and typography) and verbal (concentrating on writing). These modes are semiotic resources available to the makers of text. I look at the modal realization of discourse in students' texts. For instance, scientific discourse realized in visual and verbal modes. I look at the aspects of the world that students choose to realize in particular modes, in a range of genres. Finally, I speculate on what certain modes enable. In looking at language (writing as mode and speech as mode), I am interested in the use of first language, other languages, slang and colloquialisms as linguistic resources. Kress and Van Leeuwen (2002) argue that colour as sign is motivated by the interests of sign makers and that it realizes ideational meaning (flags, maps), interpersonal

meaning (colour to subdue aggression) and textual meaning (colour repetition to create coherence). Media are the material resources used in the production of semiotic products and events. Media include both the tools (such as pens and pencils) and materials (such as card or wire) used. Although mode and media are two distinct technologies, they always interact, for instance, the mode of writing and the medium of the book; the mode of image and the medium of the screen.

In the next three chapters, I use the above framework to identify the representational resources that students are drawing on and transforming in their textual productions.

Chapter Five: ‘Engineering Flowers’: Identifying Students’ Representational Resources through Symbolic Objects

5.1 Introduction

In the Symbolic Object project, students identify everyday objects that have symbolic meanings and examine these objects in a range of physical, cultural and communicational landscapes. In 2002, the students identified a range of objects, including technological ‘objects’ (such as electricity, cars); natural objects (flowers, trees, dove, lion); bodily adornments, including clothes (short skirts, designer labels, pants, uniforms) and jewellery (rings, chains, beads, goat’s hair necklace). They also identified objects relating to crime (burglar bars, barbed wire, guns); political objects (flags, statues); objects representing illness (AIDS ribbon, TB symbol); religious objects (bible, cross, rosary, moon and star, dreadlocks – a hairstyle commonly associated with the Rastafarian movement). In groups, the students produce a text which discusses the physical characteristics and uses of the object, as well as the symbolic, social and cultural meanings people attach to the object.

My aim in this chapter is to identify the representational resources which the engineering students utilized in the production of their Symbolic Object texts (see appendix five for the three posters analyzed, the Flowers poster, Goat poster and Pants on Women poster). Because this project takes place at the beginning of the year and because of its unstructured nature, it is well-positioned to enable me to identify students’ resources before these encounter the expectations of the university and the discipline of engineering. In order to identify students’ resources, I analyze the posters in terms of the coding orientation of the representation; the discourses students draw on, utilize, and transform; the ways of organizing knowledge both in the world represented and the textual construction of that world. I also look at authorial voice and the constructions of social relations in the texts.

5.2 Description of the posters and practices represented

I look at three of the objects selected by three groups of students, and the posters they designed around those objects. These objects include a goat, flowers, and trousers or ‘pants’. I chose the three posters produced on these objects as they raise interesting questions about a society in transition and represent a range of topics of interest to the students. Engaging with students’ representations of their chosen symbolic object is a refracted way of engaging with

varying practices. Before going into the analysis of these posters, I will attempt to describe the practices represented by these objects in certain communities in South Africa and provide an overview of each poster. I have drawn on the interviews with the students to explore the cultural meanings of the symbolic objects.

5.2.1 Rituals of sacrifice: The Goat poster

The Goat poster investigates the functioning of signs in specific practices, in this case, a highly valued and codified practice, the slaughtering of a goat. The poster represents the different stages in the slaughtering process (See figure 2 and appendix five). According to Douglas, the structures of living organisms reflect complex social forms better than inanimate objects. In rituals of sacrifice, the kind of animal to be used is specified (male or female, black or white, old or young) (1966: 114).

Slaughtering a goat enacts a range of societal and spiritual functions. It can be a way of communicating with ancestors. One of the people the students interviewed said his grandmother slaughtered a goat once a year in order to communicate with the ancestors through the proper channels. In addition to the spiritual dimension, there is also a celebratory dimension. According to one of the students in the group,

even when I go [home] like in the holidays, sometimes they slaughter a goat ... like, you see during Christmas, ja, she [his grandmother] does that, but not every year. It is something like a celebration. We're just thanking our forefathers for what they've done for us (Interview with Victor).

The ritual of sacrifice can also perform a 'purification' function. The student gave the example that if a woman's husband dies, she needs to purify herself with the goat's large intestine: "Maybe one of the persons has passed away, then they have to cleanse him or her with a goat, something like that. But they use this skin from the large intestine" (Victor). He also claimed that the goat can be used for 'purification' from family ties:

You see in my culture, we not allowed to like ... if you my relative, I can't get married with you. So, it's something like that. But, it - somehow it just happens anyway, then they gonna say we have to finish that relationship, because you see when you're, like, relatives, you have to say, "OK, now we no longer relatives," so that you can able to get married, so you gonna have to cleanse you with a goat. (Interview with Victor).

The student establishes how to interpret this cultural practice through talking to me as 'Other' in terms of his cultural understandings.

Some objects function as indicators of social status, although status is always relative to a reference group. Status is also an indicator of power. It consists of the respect, consideration, and envy of others. A person with status sets the standards and norms by which others will act, and in this way embodies the goals of a culture (Csikszentmihalyi and Rochberg-Halton 1981: 29). The goat indicates status to a particular community in this kind of way. This is reflected in the following statement:

The goat also provides a man (especially the fathers of their family) with some admiration by the society when he has lot of them. Not only the goat but, also the cattle, sheep and chickens. The goats show some kind of being rich of a particular family in rural areas, when they are filling almost all the space in the kraal. This is because the animal can be sold or used for some very expensive cultural practices like lobola¹ (Andrew's written reflection).

Although slaughtering a goat is a practice dating from pre-colonial economies, it is still very prevalent in our society today. For instance, when Peggy-Sue Khumalo was crowned Miss South Africa of 1996, she announced that she would sacrifice a white goat to celebrate (Barnard 2000: 348).

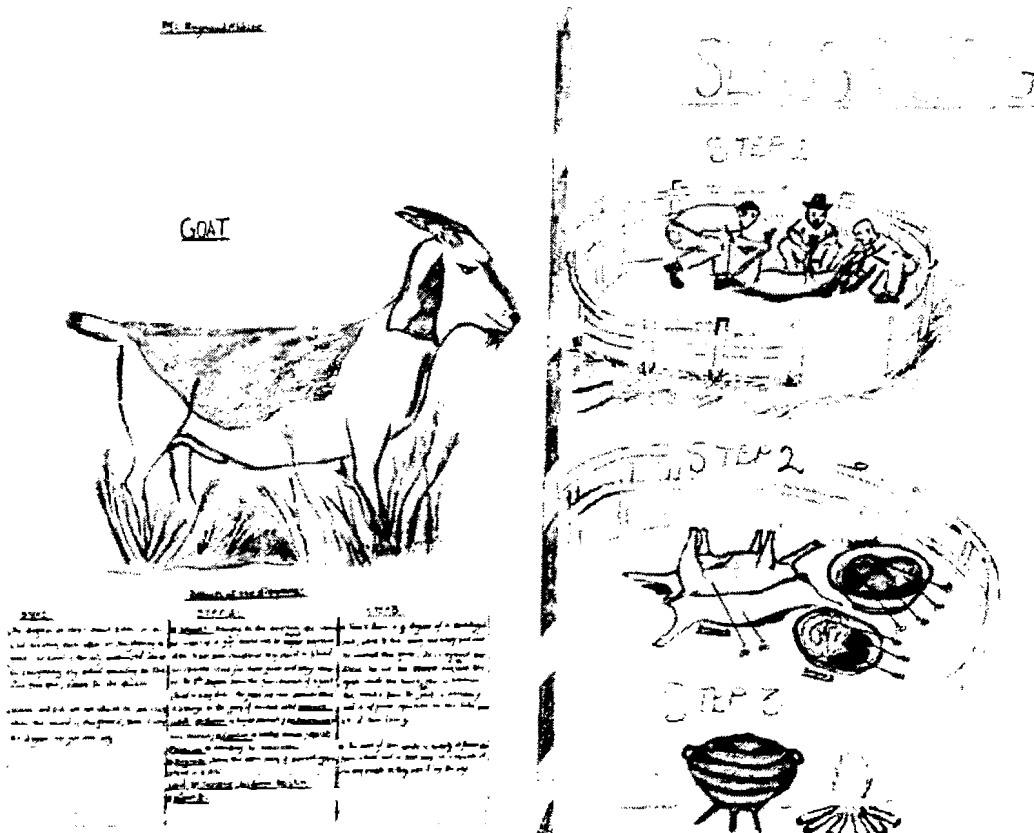


Figure 2: Goat poster

¹ Lobola or 'bride wealth' is a traditional African practice where a bridegroom has to provide cattle or some other compensation to a prospective bride's family before marriage can take place.

5.2.2 Physical and cultural landscapes: The Flowers poster

The Flowers poster looks at the physical and symbolic meanings of flowers or, as the students say on the poster, “flowers as part of geographical, cultural and communicational landscapes” (see figure 3 and appendix five). I provided the students with a disposable camera and they took photographs of flowers around campus and of the flower sellers in the main road below campus. The images on the poster are thus predominantly photographs, with only two hand-drawn diagrams. The poster provides a definition of flowers, describes their function for the plant and discusses humans’ physical interaction with flowers, in the form of gardening, decoration, and medicinal uses. The poster describes different social meanings of flowers, as both gifts and commodities. It also describes cultural meanings, where flowers can indicate love, peace, happiness and life; but also “shed blood” and “conception”. This is how one student on the project describes the different meanings of flowers:

When coming to cultures, flowers are observed differently and this leads to different beliefs. Most people believe that red roses are the symbol of love whereas rastafarians believe that they show the shed blood of their heroes...flowers are believed to convey certain messages to certain people depending on their appearance, colour and quality sometimes. This goes to an extent where flowers are given the meanings relative to their appearance. (Thabang’s written reflection)



Figure 3: Flowers poster

5.2.3 'Fit' for change: The Pants on Women poster

The Pants on Women poster examines the issues, perceptions and cultural practices around women wearing trousers or 'pants' in different sectors of South African society. The poster comprises a mixture of extracts from interviews together with photographs and the attempt is to highlight a diversity of opinions from both a personal preference point of view, and from a cultural, social and religious point of view. In the poster, pants are seen as physical objects invested with cultural meanings. According to one woman student,

Physically pants are just clothing to cover the body for warmth and as mentioned covering your body for safety. There are different cultures in this world and it differs in each culture if they allow pants or not like Zulu, Xhosa, Swazi, they all do not allow pants. In the olden days and those places which still live by their cultures they wear skin animals, cloths, women do not wear pants (Nandi's written reflection).

The poster investigates the nature of freedom and explores whether freedom is the right to do what you want as an individual, or the right to follow your cultural practices. Within this context, it explores gender issues and stereotypes about men's and women's roles, and the link between cultural norms and religion. Ultimately, the value placed on body image and the issue of 'looking good' seem to be awarded the highest status.



Figure 4: Pants on Women poster

In the next section, I analyze the textual productions of the students in terms of my theoretical framework. Table 5 summarizes the coding orientation, the discourses, and the underlying ways of organizing knowledge that emerge from the three texts.

Analytical Category	Goat Poster	Flowers Poster	Pants on Women Poster
Coding Orientation	A mixture of naturalistic and abstract coding orientation.	A mixture of naturalistic, sensory and abstract coding orientation.	Naturalistic coding orientation.
Discourse	Scientific Gender Nostalgia	Scientific Gender Religious Utopianism	Gender Propriety Individualism Utopianism
Ways of Organizing Knowledge	Conceptual: <i>Analytical Hierarchies</i> <i>Part-whole relationship</i> <i>Syntagmatic logic</i> Narrative: <i>Change from one state to another</i>	Conceptual: <i>Classification processes</i> <i>Binaries</i> <i>Paradigmatic logic</i> Narrative: <i>Change from one state to another</i>	Conceptual: <i>Binaries</i> <i>Paradigmatic logic</i> No narrative structure.

Table 5: The coding orientation, discourses and ways of organizing knowledge of the Symbolic Object posters.

5.3 Coding orientation

I will begin my analysis by looking at how particular coding orientations are realized in the posters. They can appear differently in one text, although one orientation will usually be more dominant with traces of other coding orientations present. For instance, an image can be abstract in respect to one modality marker and naturalistic in respect to another.

5.3.1 Naturalistic coding orientation

The coding orientation of the Goat poster is naturalistic, although the context is established only through minimalist detail in the background. This minimal context serves to highlight the analytical nature of the representation, and to demonstrate discursively that the practice of slaughtering is an age-old and timeless one, with set traditions and codes of behaviour. Through this, the represented participants become generic. The goat alive and intact is represented in a naturalistic setting of grass and shrubs. Once it becomes a part of the human ritual, however, it is placed in the cultural setting of the 'kraal'. This contextualization is achieved by a few tufts of grass to indicate that the setting is outside and parts of the kraal fence which represent 'inside a cultural space'.

Within the naturalistic coding orientation, photographs are a mode well-suited to emphasizing context and realism. In some of the photographs on the Flowers poster, the context is fore-

grounded, like the ivy on the walls of the campus; the position of the flower seller in the streets of Cape Town; the reception area in the foyer of the residence. Thus, photographs can be used to locate specific contexts and represent high modality in a naturalistic coding orientation. However, they can also be used to obscure context as in the photograph on the bottom left hand corner of the Flowers poster (see figure 5). The focus of that photograph is the bright cerise flower and the environment or the ‘field’ is a place on the university campus (the steps the residence to upper campus). The photograph is rotated onto its side rendering the field transformed or recontextualized from location to ‘textured background’. Here the unclear nature of the background produces lower modality to that which is represented in the foreground. In contrast to this photograph, the hand-drawn diagram of a marijuana plant (see figure 6) performs the function of representing only the plant, and the environment or field is not represented. Thus the representation has low modality in a naturalistic coding orientation (but high modality in an abstract coding orientation). In commenting on the choice of media, the students demonstrated perceptiveness about the affordances of media and mode in emphasizing context and realism. This perceptiveness is encapsulated in the following comment: “Our *drawing* of marijuana plant is made because it saves us. Marijuana *photo* may take us to jail” (Mthoko’s written reflection, emphasis added).

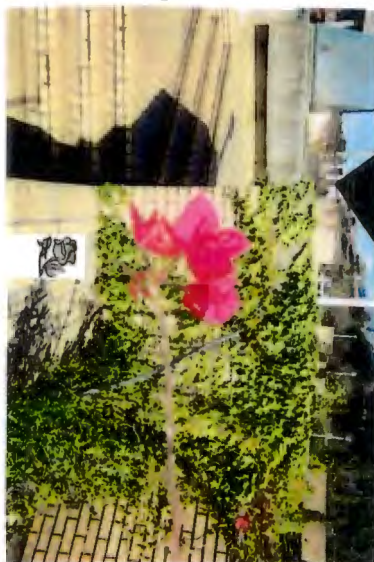


Figure 5: Transformation of context from location to textured background (Flowers poster)

The dominant coding orientation of the Pants on Women poster is also naturalistic. However, as in the Flowers poster, context is de-emphasized in many of the images, especially the images with women standing on chairs to ‘show off’ their pants. Because they are faceless, the women become decontextualized, generic ‘types’ in this representation, rather than particular and unique people. The two very dark photographs of ‘faceless pants’ at the bottom of the poster are interesting from a composition point of view. The photographs are divided in half by the horizontal line created by the chair the women stand on. The bottom half of each

photograph comprises the tiled floor which creates a decontextualized feel, although it points to a general institutional setting. From the viewer's perspective, it is ironic that the poster mentions appropriacy to context (as in "There are places where it is not appropriate for a woman to wear pants") but then presents almost all of the images specifically without context. The only clearly represented and identifiable context provided in the poster is that of the church, nearby the campus.

5.3.2 Abstract coding orientation

Within abstract coding orientation, modality is higher the more an image reduces the specific to the general. In the Goat poster, the drawing of the goat is done in pencil (including the headings, divisions of the page, text block, and text) and the labelling of the diagram with the arrows is done in black pen. The use of pencil and black pen as inscriptional media emphasizes the diagrammatic nature of the representation, with low modality in the naturalistic coding orientation, but high modality in the abstract coding orientation. In sharp differentiation from the pencil, the colour red is accentuated in the poster. The colour red realizes the ideational metafunction in the text. The blood of the slaughtered goat is emphasized as a key signifier as it is crucial in the ritualistic process of cleansing and purification. The inscriptional media and the mode of colour contribute to the high modality of this representation within the abstract coding orientation.

The abstractions in the Flowers poster are not in conventionalized forms, as in the use of icons only identifiable to particular discourse communities, but rather comprise a creative use of image and written text. Often the captions reveal the symbolic intent of the image. There are interesting shifts between naturalistic and abstract coding orientations. Within the naturalistic coding orientation, the photographs specify context, although this context is either obscured or highlighted depending on whether the representation is generalizable (the symbolic and scientific meanings of flowers) or something more context specific (like the cultural meanings of flowers).

5.3.3 Sensory coding orientation

In sensory coding orientations, colour is a source of pleasure and affective meaning, and consequently it conveys high modality. In the Flowers poster, the vibrancy of the colours is realized through the mode of production, which is predominantly colour photography. Bright

yellows, reds and greens dominate in the photographs of the flowers, making this poster colourful and attractive to the eye. The materiality of the mode (the glossy sheen of the photographs) also contributes to the brightness of the representation. The torn rather than cut paper with written text which is used for the captions makes the Flowers poster seem more tactile than the abstraction of the Goat poster. The attempt to design an aesthetically appealing text is in keeping with the emphasis in the poster on the beauty of flowers and the positive and life-affirming nature attributed to them. Flowers are used in important cultural rituals to symbolise life and happiness, but are also used just for 'decoration'.

In the Flowers poster, the sensory coding orientation is realized predominantly through the visual mode. Although the intention may have been to frame the interpretation of the images through the written text at the top centre of the poster, this is not the effect, as the written text and heading are small and not very eye-catching. The photographs, on the other hand, are bright and alluring, and their captions are evocative. The text on the poster is printed over a faint leaf design, which turns the text into an occasion for visual display. This also creates a sense of visual coherence. The students have also used a motif (a black and grey thumbnail size picture of a rose) as a connective element to establish coherence. One of these is stuck on each picture or photograph, and the borders of the written text are comprised of strips of these motifs. The repetition of this visual motif is about principles of composition as well as aesthetic appeal. The sensory coding orientation is also realized through the written mode – through both lexicon ('delights', 'liveliness', 'clusters') and syntax ('the shed blood'). The students even invented an adjective which they used on the poster to describe someone with the attributes of flowers: 'flowerish'.

5.4 Discourse

In this section of the chapter, I discuss a number of discourses drawn on and utilized in the posters. Given that I am working with the concept of interest and design, whether the students' use of a specific discourse is conscious or unconscious is not a factor in this analysis.

5.4.1 Scientific discourse

I discussed the features of scientific discourse in chapter two, section 2.5.3. Of the three posters, only the one representing the slaughtering of a goat is overtly couched in scientific discourse. This scientific discourse is realized through the provenance of design elements,

where the drawing of the dissection is reminiscent of a scientific textbook representation (particularly its diagrammatic nature, careful labelling and the use of a key). The emphasis is on naming the different represented components and showing how the parts make up the whole. This type of diagrammatic representation lends itself to the participants and their actions being represented in a static, timeless system, rather than in a process over time. The representation of system rather than process is analogous to nominalization in written text, a key feature of written scientific discourse. (Nominalization is a process where nouns are derived from full clausal structures.) The analytical diagram is matched by the analytical written text with scientific names for the four stomachs of the goat (rumen, abomasums, omasum and reticulum). The scientific discourse of the poster is also realized through the underlying ways of organizing knowledge in the text, for instance through analytical hierarchies and part-whole relationships (I say more about this in section 5.5.1 in this chapter).

5.4.2 Gender discourse

Gender discourse operates across all of the Symbolic Object posters. It gives expression to a particular social grouping's perceptions of men and women's roles in society. On the Goat poster, the point is made about the gendered nature of the slaughtering process, who is allowed to partake in this ritual (men) and who is not (women and children). The text on the poster explains that "women and kids are not allowed to come close when the animal is slaughtered, that is why the diagram has got men only." In the image, the three men encircle the goat whilst they kill it. One holds the goat's front legs, the other the back legs, and the third slits its throat. This encirclement emphasizes the communal activity, togetherness and 'brotherhood'. The rifts in traditional practices are not represented on this poster, although this was a key topic during discussions and interviews with the students. This choice of representing traditional, timeless, unchanging practices reflects a particular ideological stance and may reflect uneven participation in the group with one person's views dominating.

It is interesting that an all-male group chose to concentrate on a topic such as 'flowers'. Flowers have been 'feminised' in some social contexts as signifying softness, beauty, adornment, perfume, and gender discourse is one of the discourses that the students seem to draw on in their exploration of the sign 'flower'. When the students presented their initial ideas about the project to the class, they began by saying that flowers are so important to some people that they even name their children after them. They asked if anyone in the class had been named after a flower. One student, Phillip, claimed he had, which caused everyone

to laugh. It was obvious that the association had been with girls' names and not boys'. The gendered nature of social practices is highlighted in a written report which accompanied this group's poster. In this a flower seller comments on the differences between men and women buying flowers.

The other florist believes that flowers are for females. He says that men do not have time to look after flowers and water them. "I feel happy when a lady comes to me to buy flowers rather than a man buying the flower because we tend to have a tough time to help him choose the best flower." Said the male florist. (Written report accompanying the Flowers poster).

Here gendered discourse is expressed in binaries which could partly be a function of the written mode: women tend to care more for flowers than men; men tend to be more indecisive when buying flowers than women.

If we think about how modes are used to articulate gendered discourse, in the Flowers poster the colour pink for the poster card is used to realize gender discourse in the visual mode. It is useful to draw on the notion of 'provenance' (described in chapter two, section 2.4.1) when looking at the associations accrued to the colour 'pink' in a range of social domains. These associations point to pink as indicating love, fondness and innocence, which is part of a socially constructed 'feminized' discourse. The visual in this case serves to express this 'feminized' discourse by association or provenance.

The association of the flower with reproduction is a strong feature of the Flowers poster. The students allude to this in their discussion of the sunflower: "Birds eat seeds of sunflower and thereafter their production rate increases." The idea of fertility and cycles is more overtly mentioned in their depiction of the marijuana plant. They describe this as "Yellow flowers, which give a sign of either a conceived woman or a woman on her period around, on a marijuana tree".² In the text box beneath the picture they write: "Rastafarians claim this to be true because they are periodically living in this situation". This is displayed in a 'before' and 'after' kind of way. Firstly, there is a picture of the "marijuana tree without flowers" and below that a second picture of the marijuana tree complete with yellow flowers (see figure 6). The visual mode here is thus able to represent the notion of fertility cycles in a very specific way.



Figure 6: Before and after blossoming: emphasizing fertility cycles

The Pants on Women group is a mixed gender group comprising one man and two women. The poster raises questions around perceptions of men and women and their roles in society in a more overt way than the Goat or Flowers posters. Ultimately these are issues about power, who has power over whom, which are also present in the other posters, but not as explicitly as in the Pants on Women poster. In the following extract, the student spells out the link between culture, gender roles and power.

Different cultures have different opinions about pants on women and married women especially in the African cultures are not allowed to wear pants. Because when they get married, they are under the husband's rule and they are in turn governed by the culture, they have to cover their bodies with long skirts or dresses. It is in these cultures that pants are associated with young girls. These women are not free to wear what they want as it is an unwritten rule that they are forbidden to wear pants. A woman cannot be equal to a man in most African cultures, another unwritten rule. (Zodwa's written reflection)

Here Zodwa clearly links the control over dress with forms of patriarchal control. There is a double-voice in this extract. On the one hand, the extract is presented as informing the reader of cultural practices. On the other, the "unwritten rules" of culture are exposed in order to question them.

What the Pants on Women poster does not examine critically is the question about what constitutes 'equality'. Does being able to wear similar kinds of clothes constitute equality, especially when the emphasis and value shift to 'looking good'? Perhaps the students could not resolve these issues in their group. Although the project is presented as an invitation to debate and strong emphasis is placed on the individual's freedom of choice, it seems that the

² Here the students are describing a belief that the yellow flowers of the marijuana plant indicate that there is a pregnant woman or a menstruating woman in the vicinity.

ideology of 'looking good' becomes a new gospel. The idea that women need to look good feeds into a particular view of gender, the sexual objectification of women. This view is encapsulated in its extreme position in the following statement on the poster: "Celimpilo feels that you must have the right figure to wear pants!"

One of the captions does not give a voice to the represented subject. Rather, a juxtaposition is set up by quoting the opinion of another, which is contrary to the main notion of freedom and choice propagated by the poster. The caption is: "Rushdien feels that women wearing pants is a 'catastrophe to male ego and a degradation to the supremacy of men' ". Here the producers of the poster distance themselves from Rushdien's opinion by placing his statement in inverted commas in order to indicate that these are his words and ideas and not their own. However, this statement appears playful and ironic in its seemingly over-the-top formulation.

5.4.3 Religious discourse

Religious discourse propagates a set of values and principles to live by and is realized through particular genres with specific rhetorical and lexicogrammatical constructions. A Rastafarian discourse is evident in the Flowers poster in the use of rather archaic biblical language: "a conceived woman", "congregation of flowers", "shed blood". There is slippage between being inside the Rastafarian life world, totally immersed in it, and framing that life world and its participants from the outside: "they believe..." and "they are periodically living in this situation." Perhaps this slippage between inside and outside is because only one member of the group was a Rastafarian. In the written text, a Rastafarian discourse is explicitly evoked in statements such as "Rastafarians claim this to be true" and "Rastafarians use red flower to simplify [signify or symbolize] shed blood of their heroes". In the images, the Rastafarian discourse is presented as 'natural' and is positioned as non-relative meaning. For instance, the 'before' and 'after' structure of the diagram of the marijuana plant locates it within a scientific discourse, where the focus is on the production of blossoms. The caption below the diagram, however, locates the meaning as cultural and spiritual: "Yellow flowers, which give a sign of either a conceived woman or a woman on her period around". It seems that, compared to Western society and its discursive organization, Rastafarian society conflates the discourses of science and mysticism, the spiritual and the physical. The caption beneath the diagram of the marijuana plant which describes beliefs about the plant is written in upper case. The caption beneath the sunflower explaining its commercial and scientific

uses is also written in upper case. By using upper case for these two captions, it seems that the symbolic and the functional are given equal status, and the explanation based on 'belief' is given equal authority to the 'scientific' explanation of the sunflowers.

The topic of 'Pants on Women' is largely weighed up and evaluated through the lens of the discourse of Christianity which is reinforced by a sense of propriety. The photographs of women are arranged around the centre (the church). The dominant feature of the poster is the central image of the church, with the sub-heading 'culture and religion' to the side of the image, and the largest piece of text in the largest font underneath it. This is written in a highly personal voice:

My point of view is that, back in the days when Jesus was on earth there were no pants. Everyone wore robes. It is stereotype to believe that men should wear pants and women wear dresses only. No where in the bible does it specifically say women should not wear pants.

Some of the arguments for freedom of choice in what women wear are constructed through interpretations of the bible and are embedded in religious discourse. Thus freedom and individualism are uneasily positioned within religious discourse, which is a collective construct.

5.4.4 Discourse of propriety

Closely related to religious discourse is the discourse of propriety. It is a moral view on adherence to convention. I have called propriety a 'discourse' as, in line with my definition of discourse (outlined in chapter two section 2.4.2.1), it gives expression to the values of an institution or social grouping. Because propriety is about appropriate behaviour in a specific context, it is inextricably a part of other discourses, such as gender and religious discourse. Propriety operates in the sociocultural milieu through the internal regulation of behaviours as the effect of a particular emotional, political, economic heritage which allows the subject to be located in a particular social universe (Mayol 1998: 16 – 21). According to Mayol, propriety includes social transparency, especially in social domains that do not take transgression well. Propriety is expressed through "the negative form of a 'how far is not going too far?' attitude" (1998: 21).

The signifiers of propriety are often realized semiotically through the representation of the body. Many of the Symbolic Object projects deal with the body as inscribing identity. Teenagers and young people tend to have a very strong awareness of ‘image’, the presentations of the physical self in particular contexts. The body is overtly seen as a text to be inscribed, as a way of making statements about identity (personal, cultural, and religious identity). These statements are often made in relation to a conception of propriety, and can be a reaction to or endorsement of the perceived principles embedded in this conception. The emphasis on the ‘fit’ of the pants is part of this discourse of propriety, although it is part of an almost moral imperative to ‘look good’ as well. The notion of the ‘aesthetic’ is also about power. Prince (1994) has argued that aesthetics involve a replacement of vanishing theological standards with a performative ritual, in which an increasingly heterogeneous audience could be united through its shared responses to select aesthetic phenomena. Propriety is a combination of taste (realized as aesthetics) and ethics (realized as a particular morality). For example, if the pants are too revealing then it is not appropriate for a woman to wear them. Taste and ethics are realized as one composite worldview which appears seamless and non-contentious, but the rifts are apparent in a poster like *Pants on Women* where the emphasis is on ‘looking good’ as well as ‘behaving appropriately’. This uneasy mix of respect and ‘looking good’ is emphasized in the following statement by a student:

Most Africans forbid the wearing of pants to church by females regardless of their *age* and *size*. This is because the church is perceived as a *respectable* place and pants as inappropriate there. (Zodwa’s written reflection, emphasis added)

The emphasis on ‘age’ and ‘size’ point to concerns of ‘fit’ (who looks good in pants and who does not), and the idea that pants are not entirely ‘respectable’ comes through. One of the harsher judgements of youth and propriety emerges in the following statement: “As a student, this project made me think about what older women look like when wearing pants and its impacts socially” (Zodwa’s written reflection).

Social transparency seems to go hand-in-hand with a particular kind of scrutiny. Only one photograph of Nthabiseng walking down a ‘sweeping’ staircase, one hand on hip, is reminiscent of modelling conventions. Perhaps what is startling about the photographs displaying women wearing pants is how they flout modelling conventions entirely. These images of women are presentations rather than displays, facts rather than creations. The models in magazines are specifically rejected in preference for the ‘realistic’ images of real

people. This could be because the subject matter has been pedagogized within an institutional setting and a naturalistic coding orientation.

Photos gave us the opportunity to show how women looked like when wearing pants and how pants came in all sizes and shapes. (Zodwa's written reflection)
This allowed us to show the real fit of pants on people's bodies and one can actually view the picture and figure out why that particular person is wearing such pants (Nandi's written reflection)

The strong sense of scrutiny here is not that of a gaze directed at a fashion magazine, but more that of a judge of degrees of propriety. The discourse of propriety is realized through the provenance of design elements here, where an awareness of design in modelling conventions is shown. These conventions are not drawn on (whether consciously or unconsciously) and signs are not imported from the fashion magazine context. In this way, the representation distances itself from the ideas and values associated with that context. Also, as an interesting aside, although the emphasis is on the fit and 'looking good', these statements of image are not framed in relation to a materialist consumerist discourse (for example, brand names are not mentioned at all here as markers of identity).

The discourse of propriety functions by favouring the collective over the individual and therefore upholds societal boundaries. It functions by specifying appropriate behaviour in relation to others. Upholding the individual threatens to bring down boundaries; consequently the common view or opinion is valued over the 'maverick'. This is encapsulated in the following statement on the Pants on Women poster:

Physically pants are a way of covering our bodies but when they are worn with other motive such as to attract attention they can be a problem.

Here a sense of propriety is valued over 'attracting attention to oneself' in an individualistic way.

5.4.5 Discourses of utopianism and nostalgia

The discourses of nostalgia and utopianism construct history and narrativize the past and future. By promoting or wishing to preserve an imagined ideal state, these discourses can either be about 'change' or about 'conservation'. The imagined ideal state is defined according to the meanings and values of a particular institution or social grouping.

The Flowers poster draws on and propagates a strong utopian discourse of peace, harmony and unity. This is part of religious discourse, specifically Rastafarianism. Utopian discourse also draws on an over-simplified notion of 'rainbow nationalism' employed by the new South African nation to highlight and celebrate diversity, even though as a blanket concept it sometimes masks complex and contradictory configurations of identity. This view of the 'rainbow nation' is achieved predominantly through personifying flowers, or at least giving them agency, as in statements such as "Peace and Happiness. The outgrown flower shows appreciation, youthful delights and liveliness. It appreciates living together in peace". Human emotions and perceptions are attributed to the flowers in this statement.

Other captions read: "Team work. Some flowers are made up of clusters of small flowers" and "Unity. The congregation of these flowers around the same place symbolises togetherness and patience for one another". 'Congregation' also has religious connotations, the gathering of people for a religious meeting. This commentary on the importance of working together and having patience with one another was perhaps also pertinent for the particular group of students who produced this poster. Although they were intrigued by each other and their differences of ideas, beliefs and behaviours, working together did require patience and tolerance of these differences. One student from the group, the Rastafarian, struggled to articulate these differences:

I don't know how to put it, but I can manage to work with the people who are actually not of my company, but when I'm in work, I mean, I don't mind about it, and then I don't take it into my consideration that others are not of my company, but I can still manage to work with them (Interview with Mthoko).

By 'company' here, the student refers to people who are not of his 'kind', who are very different from him in culture, language, beliefs and manner.

Rather than utopianism, the Goat poster represents nostalgia for traditional practices. Ritual and representation thereof "enlivens the memory and links the present with the relevant past" (Douglas 1966: 64). The slaughtering of a goat is represented as both a traditional and a current practice that has not changed over time. In contrast, there is a strong voice in the Pants on Women poster that represents change as an unquestionable good, and as an affordance of the modern era which frees us from the limits of tradition. The Pants on Women poster draws on a utopian ideal of individual freedom, choice and change.

The discourses I have identified in the students' texts and discussed here include scientific, gender, religious, nostalgic and utopian discourses, as well as a discourse of propriety. These discourses co-exist in the students' texts, and naturally there are many links, overlaps and sometimes tensions between them. For instance, there are strong convergences between gender discourse, religious discourse and a discourse of propriety. Gender discourse and propriety work together to describe what it is appropriate behaviour, mostly for women, and the locus of attention is often the body.

5.5 Ways of organizing knowledge

The way knowledge is organized is a realization of discourse. So, for instance, analytical hierarchies and classification processes realize scientific discourse, along with abstract and technical coding orientation. The underlying ways of organizing knowledge in the texts include the relations between textual entities and the ways in which organizational structure encodes meanings. This structure can be either conceptual or narrative.

5.5.1 Conceptual frameworks

As explained in chapter four (section 4.6.2.3), the conceptual frameworks operating in texts focus on representing participants in terms of their classification processes, both through analytical hierarchies and vertical taxonomic relationships.

5.5.1.1 Analytical hierarchies

The scientific discourse of the Goat poster is realized through two types of analytical hierarchies. 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. The analytical hierarchies of the Goat poster are realized through the composition of the poster. There is a tightly framed 'before' and 'after' structure and the poster is organized both along the vertical and the horizontal axes. This framing is realized 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.

5.5.1.2 Part-whole relationships

The scientific discourse of the Goat poster is realized through the relation between the participants and the processes 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 7 below).

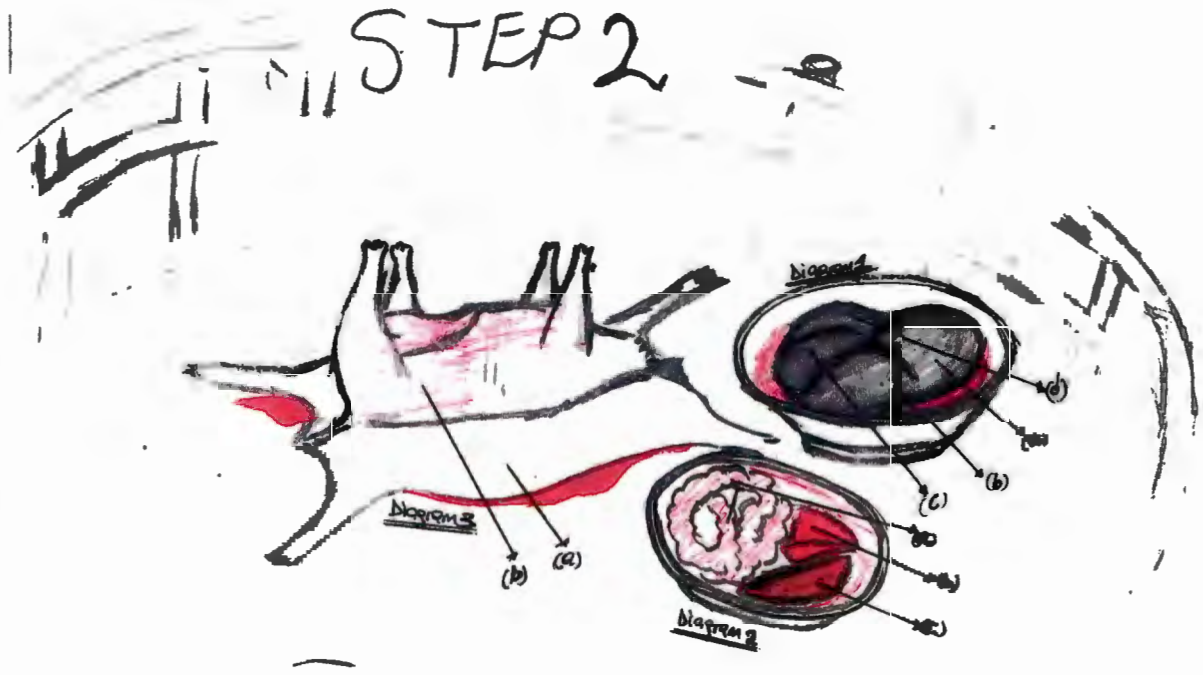


Figure 7: The division of the internal organs of the goat.

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 the student’s written reflection:

The poster with drawings has been chosen³ because it allows for some many exposures that can be made on the selected portfolio. The most important of all are the *internal*

³ The students can choose any medium of production and any ensemble of modes. Many chose the poster form, whilst others produced 3-D models made from a variety of materials (cardboard, wire, beer cans, paper mache). I do not look at the 3-D representations in my analysis, but focus on the posters as this is a genre which the students need to produce both on the Communication course and in the general engineering curriculum.

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. (Andrew'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 everything at the same time, unlike the sequencing possible with written text.

The Goat poster is both analytical and narrative. (I discuss the narrative structure in section 5.5.2) 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 idealization of traditions. As argued earlier (in section 4.5.1), this comprises the scientific discourse of the poster. Through the emphasis on 'possessives', the participants and their actions are presented in a static order and the process is reified into a system. Thus, the visual representation here is able to blur the boundaries between the dynamic and the static; the process and the display.

5.5.1.3 Classification processes: Binaries

5.5.1.3.1 The abstract and the particular

The Flowers poster classifies concepts according to abstract and particular meanings. Key to the realization of this classification is the way in which representations are contextualized. 'Contextualization' is the scale running from complete absence of background to very detailed background. In some of the photographs on the poster, the context is foregrounded, and in others, it is obscured.

The two photographs of the flower sellers in the Main Road below campus are contextualized to different degrees. The first picture of the flower sellers has a selective focus on the flowers, and it is not possible to locate this image in time and space. The caption reads 'Flowers as part of business' and the commercial enterprise of selling flowers as a general principle is

beer cans, paper mache). I do not look at the 3-D representations in my analysis, but focus on the posters as this is a genre which the students need to produce both on the Communication course and in the general engineering curriculum.

emphasized. The second photograph is positioned more centrally, but is placed at an angle echoing the first. The focus is more on the context which is established through a recognizable shop name, 'Fountain Framers', than on the flowers, which take up less than a quarter of the photograph. Context is important here as the interest falls on the flower seller and her views.

Context is emphasized in some pictures more than others in order to achieve different classification purposes. The environment or field is not represented in the photo of the sunflower. A stark light and dark contrast forms the backdrop for the bright yellow flower due to a bright light causing a stark black shadow. The caption reinforces the notion of sunflower as 'type' by speaking scientifically about its uses in food and for commercial purposes. The caption is written in upper case, perhaps to show the objective authoritative nature of the information. The context for the placing of the pot plants on the windowsill is selected as important in the Flowers poster, as somewhere on the boundary between 'inside' and 'outside'. The photograph entitled 'Me Too' represents these pot plants with half of the image taken up by the window. The caption says "Their best place is the window sills". In the photographs of the flowers in outside contexts, the environment is not emphasized at all; the focus is on the flowers themselves as types, and not where they are located on the university campus. In fact, the one photograph with an identifiable location is rotated to render that location obscured (as discussed under section 5.3.1). Only the photograph of the ivy on the walls of the university is placed in a specific context. It is anchored by the caption as drawing on part of the larger mythology of campus life and rhythms.

I have attempted to show how this obscuring and highlighting of context serves to function as a kind of classification. The concepts on the Flowers poster are classified into the general and the particular. The generalizable or the 'typical example' can be either symbolic or representative of a 'scientific' truth, and the particular is connected with a location in a specific moment in time, and with specific cultural meanings. The system of classification is realized through the compositional layout of the poster. The 'given' information includes the physical characteristics of flowers. The 'new' information is the culturally-specific and sometimes idiosyncratic interpretations of the symbolism of flowers. This is the 'new' because it is presented as something not yet known, the message of the poster. In this poster, the move from given to new is a gradual movement from left to right.

The underlying classification for the Flowers poster can be presented as a system of binaries. The abstract is linked to generalized meanings and to nature. This is in opposition to the particular, which is shown to be context-specific and linked to culture (see table 6 below). These systems of classification are a conceptual cognitive resource for students to draw on within engineering, even if they would be somewhat changed in that context.

The Abstract	The Particular
Generalized meanings of flowers Symbolic meanings (love, wellness, life, conception, unity and peace) Scientific meanings (food, decoration, medicine, economics)	Context-specific meanings of flowers Cultural meanings Religious meanings
Views of Nature Outside Free Not located Real	Views of Culture Inside Circumscribed Located Artificial

Table 6: Binaries operating in Flowers poster

Within the Flowers poster, the students have demonstrated knowledge of the symbolic, cultural and physical domains and the coding orientations attendant on these. Only occasionally do the coding orientations blur in sometimes jarring ways, as demonstrated below in the caption for the photograph of the ivy growing on the campus walls:

Winter Signs. Ivy on the walls of Smuts Hall, UC. It grows on the walls of the buildings and covers them. They do not have big worms like the grape trees which also grows the same way as the ivy.

Here it is important to elucidate the classificatory principles. The symbolic and the functional domains are thrown together in this statement, creating a disjuncture in the system of classification operating in the poster. Sometimes this mix of discourses and domains of practice is done in a way that does not produce disjuncture in meaning but is, in fact, highly evocative and generative. For example, the text block entitled ‘Together we stand divided we fall’ says:

The joining together and the spreading of the adventitious roots of these flowers shows the ability to work together, sharing strengths and they also create more security amongst themselves and the surrounding objects also benefit. For instance they also protect the earth surface from soil erosion.

Although the title (‘Together we stand divided we fall’) frames this as a symbolic orientation overall, there are easy shifts within this from the language of school biology (“the spreading of the adventitious roots”) to symbolic orientations (“shows the ability to work together, sharing strengths and they also create more security amongst themselves and the surrounding

objects also benefit”), to the domain of development explored by this course (“For instance they also protect the earth surface from soil erosion”).

5.5.1.3.2 The individual and the collective

The Pants on Women poster also operates on a binary classification system. There is a tension here between ‘individuals’ and ‘types’; the particular and the general; the contextualized and the decontextualized. The personal spaces, photographs and opinions are contrasted with the depersonalized, institutionalized spaces.

On the right of the poster, there are five photos of faceless women on pedestals displaying their pants. These are all tilted at an angle, facing inwards towards the centre, the church. The uniformity of their positioning on the poster emphasizes the notion of a ‘type’ rather than of individuals. There is a gritty realism to these images where the body is represented rather than the context. On the bottom left, the picture of the woman in a skirt is tilted towards the centre, in the opposite direction to the ‘faceless pants’ pictures. In this way, she is assigned an individuality that is negated in the other pictures. The caption also confirms this individuality: “Nthabiseng is a different individual altogether she doesn’t feel comfortable in pants but she doesn’t have a problem with other women wearing pants.”

The binaries in the Pants on Women poster are realized through the light and dark composition. The photographs at the top of the poster are generally lighter than those at the bottom. The lighter photographs reveal the torsos of the represented participants within the personal space of their residence bedrooms and the building of the church. The darker photographs at the bottom indicate the institutional setting of the university residences, the passage ways and staircases. There is a lack of colour differentiation, and from a distance it is difficult to distinguish the subject from the context. Whether this was done deliberately or is a result of not being skilled photographers, it does contribute to the effect of a decontextualized type within an indistinguishable context.

Discourse of Personal Freedom	Discourse of Propriety
The Individual Freedom to choose, to express yourself	The Collective Conforming to the collective / Not attracting individual attention
Personalized Personal view points	Depersonalized Cultural view points and institutional view points
Context-specific Representations of people's views, in their specific contexts	Generalized Representations of 'types' of physical 'fit' of pants
Culture as change	Culture as static

Table 7: Binaries operating in the Pants on Women poster

This system of binaries does not function as a neutral system for organizing knowledge as in the Flowers poster, but rather as a source of tension in the poster. This tension is evident at times in the contradictions between the written and the visual modes. The individuality of the represented participants is upheld in the written mode through naming; but negated in the visual by the faceless representations. In general, the captions of the photographs are highly individualized expressions of personal opinions, and thus work against the represented participants becoming 'typical examples'. The modal division of labour between image and captions enables these binaries to be expressed, and resolved to a certain extent. The tension between the written and visual modes could be a reflection of an aspect of the process of production – with a different student producing the captions to the one taking the photographs.

In the binaries underlying the Symbolic Object posters, there does not seem to be valorization of one pole of the opposition. This is in contrast to the binaries of Western scientific discourse where hierarchical binaries are established, and the abstract and the generalizable are valued over the particular and the context-specific.

5.5.2 Narrative structures

The Goat poster is both analytical and narrative in form. 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 - it describes the sequence of and the connection between the elements. According to Mary Douglas (1996: 64), syntagmatic meaning is a feature of ritual practices where events occur in regular sequences and acquire a meaning from relation with others in the sequence. Without the full sequence individual elements become lost.

Narrative also takes the form of movement from or transformation of one thing to another. The written text on the Goat poster begins by talking about 'a' goat: "three men in a kraal assisting each other on slaughtering a goat". Once the goat is slaughtered it is referred to as 'the' goat. Thus the transformation from the 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. Similarly, the Flowers poster represents a transformation from the physical to the symbolic meanings of flowers.

Although there are these moments of narrative in the texts, narrative does not appear to be the predominant organizing structure for the Symbolic Object posters, which appear to be more analytical in nature. In the Flowers and Pants on Women posters, the elements of the spatial composition (images and text) form a collage. Text and images are overlaid and many are placed at angles in relation to each other. Thus, clear reading paths are not delineated in these non-linear texts. In the Flowers poster there tends to be a progression from left to right, from the specific on the left (personal, economic and physical meanings) to the more generalizable on the right (cultural symbolic meanings). In the Pants on Women poster, the centre has salience and the margins are organized around it. Each represented participant is related to the key discourses of religion and propriety. In both of these texts, there is more meaning in the individual elements of the composition than in linear texts, where the meaning is derived from connections between elements.

The fact that conceptual frameworks appear to be more prevalent than narrative structures in the Symbolic Object posters is interesting because in genres constituted by the written mode, narrative structure seems to emerge more strongly (see chapter six for my analysis of the students' written reports). This could be an affordance of modes in this particular context. The visual mode could enable conceptual representation with these students, whereas the written mode is closely linked to narrative, both in their experience of writing in school and in other contexts. The Symbolic Object posters have revealed sophistication in the conceptual frameworks that students bring with them to the academic context. I will now analyze authorial voice across the projects and then look at the use of local languages as a resource in meaning-making.

5.6 Authorial voice and constructions of social relations

In the unregulated spaces and genres of the Symbolic Object project, the students were able to draw on a range of knowledge sources ('experiential' knowledge, researched knowledge, and belief systems) and utilize a range of discourses (academic and non-academic, primary and secondary discourses). The effects of this range of sources and discourses on authorial voice are interesting to note, as well as the ways in which the texts construct social relations. Authorial voice in these group-produced texts is complex and contradictory, as indicated above in the discussion on discourse. Although the authorship is collective, in these group projects sometimes the representational responsibility falls on one person, and sometimes on a 'marginal' person in the class (like Mthoko, the Rastafarian, in the Flowers poster and Andrew in the Goat poster who was very quiet and on the periphery of class activities and discussions). The division of labour worked in specific ways to create very particular texts. The Goat poster produced predominantly by Andrew masks the rifts in authorship. The Flowers poster is more multi-voiced, but remains coherent. The Pants on Women poster, on the other hand, overtly reveals the rifts in authorship and opinions in the group.

5.6.1 The Goat poster: 'In the know'

The implied producer of the Goat poster is one who 'knows' and who is 'in' the culture. The audience is constructed as an outsider to cultural practices. By pronouncing on generalized systems of belief in the Goat poster the students' authorial voice seems more authoritative. The implied audience constructed by this image is 'one who does not know' or who knows very little about African traditional spiritual practices. Therefore, the intention is to inform and explain such practices. According to Andrew,

The project was essential for students to conduct it because it is some kind of explanation to some students who didn't know more about the animal and it develops the skill on how to [dissect a goat] technically and physically.
(Andrew's written reflection)

The relationship between producer and audience is constructed (both visually and verbally) as one who is in a position to know, to one who is not; one who can guide understanding to one who needs to follow that guidance. For example, the written key to the visual text circumscribes and guides the viewer's interpretation of the text. There is a kind of normativity operating here; the viewer should trust and use the knowledge offered by the representation. The viewer is also aligned with certain forms of representation, and social affinity is produced. For example, the gendered nature of the slaughtering process is

presented but not questioned, as is the timeless nature of cultural practices. The representation of a culturally-specific practice reinforces a sense of identity. According to De Certeau, a practice is what is decisive for the *identity* of an individual in a group insofar as this identity allows him or her to “take up a position in the network of social relations inscribed in the environment” (1998: 9). Together with the construction of the implied audience is a strong discourse of belonging within the group, encapsulated in statements such as “In our culture” and “According to tradition”.

5.6.2 The Flowers poster: Authorial voice in ‘Nobody and Co.’⁴

There are many strong statements of authority in the Flowers poster, presumably because the students drew on the primary collective knowledge of the group and their own interviews (for example, with the flower seller). The main text block on the poster begins with “We have two classes of flowers”. This exposition continues with more present tense statements of generalizable truth: “People use to decorate their yards and houses by flower”, “Flowers such as cauli-flowers are used as sauces of food” and “Couples prefer red roses as an indication of love.” There are other categorical statements on the poster which make no reference to the relative nature of meaning. For example, “Yellow flowers indicate friendship, green for happiness and blue for peace”. Alongside the strong statements of generalizable truth, the relativity of cultural practices is also emphasized with words like ‘usually’, ‘some people’, ‘mostly’, ‘sometimes’, but not through the use of tentative modals such as ‘could’. This lack of tentative modals enables a strong authorial voice to be maintained, whilst still demonstrating the relativity of meanings. The awareness of the socially constructed nature of meaning is also demonstrated in the use of the expression “are believed to”: white roses are “believed to symbolise peace and love”, and “pink roses are believed to symbolise love and fond because of their colour and they look innocent”. In the latter quote, a socially constructed and agreed view is aired through the passive form: pink roses indicate love and fondness. This social view is thrown together with quite a personal idiosyncratic view: “and they look innocent”. These distinctions between socially constructed and idiosyncratic views are not indicated on the poster.

⁴ The name of ‘Nobody and Co.’ comes from the name of the rural village that this group investigates and from the place where one of the group members originates, namely Nobody Village.

It is clear that the Flowers poster draws on 'folk' knowledge, systems of belief and practice, as well as experiential knowledge, the students' experience of the object within particular practices. The poster also draws on previously acquired (rather than currently researched) knowledge when thinking about the physical properties of flowers. Within the representation there is no indication of the status of knowledge; knowledge from these different sources is presented equally factually. The physical properties of the flowers are presented in the same way as the beliefs about flowers and love, for example. Also, agency is attributed to natural phenomena: "It appreciates living together in peace".

Authorial voice is also realized through inscriptional media. The heading, 'Nobody and Co. Communication Assignment May 2002', is written by hand and in a very faint blue pencil, and thus does not dominate the poster, even though it is given a large amount of space and is placed in a primary position on the top left. The effect of this heading is to highlight an awareness of the artificiality of the text; that this text is produced as an 'assignment' on a particular course. The use of pencil for the heading 'Nobody and Co.' can also be seen as more personal than type-face, more like a personal signature. However, there is an unwitting irony here as the signature may be personal, but it is the signature of 'nobody'.

Interestingly, the producers of the Flowers poster claim authorship of the photos and drawings, but not of the written text. For some of the students, photography was a new medium as they had not used a camera before. For others it was unusual to produce a multimodal text in the formal classroom environment. Perhaps they felt that the creative work had gone into the visual representations, more than into the verbal representations and thus deserved acknowledgement.

5.6.3 Pants on Women poster: Highlighting the tension between convention and change

In the Pants on Women poster, there are two predominant authorial voices operating. There is a very personal voice as evidenced in the following: "My point of view" and "It's always very interesting to learn about other cultures". This personal voice is juxtaposed with a more distant voice: "What makes a woman is it what she wears or who she is?" and "What makes a man, pants or integrity". Juxtaposed with the above invitations to reflection and overt statements of opinion, are categorical statements like "Pants look good on women that is unarguable" and "There are places where it is not appropriate for a women to wear pants".

The fact that these may be the unacknowledged opinions of someone interviewed rather than a general statement of truth is indicated by the quotation marks surrounding these statements. The distinction between the overly personalized voice and the distant objectified rational voice reflects the tensions in the poster between the personal and the collective, the individual and the 'type'.

Although the Pants on Women poster is more explicitly multivoiced than the other two posters, the emergent dominant view is that of individual freedom of choice. One of the strips of written text on the poster reads as follows: "Kaya feels that wearing pants is optional and it depends on your personal value / judgement system". The 'outlying' views, such as the extreme sexist statements, serve to reinforce the dominant view. A distance from particular viewpoints is established through the design of the representation. For example, one caption is placed almost vertically making it very difficult to read: "There should be a distinction between men and women i.e. men should wear pants and women dresses." Here the layout works against readability, thus undermining the message to an extent.

The view of individual freedom and choice is in conflict with the notions of propriety operating in the text, where appropriate behaviour in relation to others is emphasized. This conflict is evident in the following statement:

Today's generation just believe that do what fits you well if do not fit you well do not wear it. That means as long as you are comfortable on pants just wear them, if you don't just leave them. But the fact remain that pants on women is for western culture not Nguni culture. (Tumi's written reflection)

There is a central tension in the above statement between freedom of choice and persisting cultural traditions; perhaps this epitomizes the tensions between generations, cultures, and beliefs that many young people are grappling with. There is an opposition between views of culture as static and self-perpetuating and culture as dynamic and changing.

In many cultures and traditions the act of wearing pants is strictly prohibited but culture changes every generation! (Pants on Women poster)

In the Pants on Women poster, the multivoiced nature of the text is realized modally through typography. This is predominantly through the headings which are represented in two ways: 'thought' bubbles (indicated by wavy edges) and 'attention-grabbers' (indicated by jagged edges). The heading 'Pants on women' is encapsulated in a thought bubble, as are the statements 'what do you think?' (in the top left hand corner of the poster) and 'we killed the

world' (in the bottom right hand corner). The positioning of the question 'what do you think?' on the top left of the poster introduces the theme of freedom of thought propagated by the poster, and invites the viewer to form his /her own opinion based on the issues raised in the poster. The statement 'we killed the world' on the bottom right of the poster is a kind of meta-reflective, tongue-in-cheek concluding statement passing judgement on the production. Whereas the 'thought bubble' headers open up the topic and pass judgement on the students' production, the 'attention grabber' headers carry the weight of the content of the poster. 'Eye catching' encapsulates the theme of beauty and bodily adornment; 'personal judgement' and 'thought provoking' encapsulate the strong theme of individual choice and the idea that one must think for oneself.

5.7 Language as a resource

There was an interesting multilingual spin-off to the sharing of knowledge in the classroom. This was partly due to the changed power dynamics between teacher and students, and partly due to the subject matter. By talking about home and cultural practices in the classroom, a respectful space seems to have been created for the use of home languages and students particularly drew on home language as a resource when talking about practices deemed culturally-specific. When the goat group spoke about 'purification', they spoke in Xhosa and used the Xhosa word for 'large intestine' ('ithumbhu'). They were talking about the practice performed by a woman if her husband dies, namely 'washing' herself with the goat's large intestine. However, the Flowers group did not draw on home languages significantly as a resource in the processes of production. This is perhaps due to the fact that the group comprised speakers of a range of South African languages and English was the one common to all. Also, English is part of global 'scientific' discourse.

Home language seems to have been drawn on as a resource only in the process of production, and not utilized in the final products, the posters. The only exception is words that have such common currency in South Africa that their use is not regarded as language 'mixing', such as the word 'kraal' which refers to a circular pen used for cattle. It is interesting that the word 'dagga' which has common currency in South Africa is not used on the Flowers poster. Rather the word 'marijuana' is used which could indicate the students are drawing on a global culture of Rastafarianism, rather than other South African subcultures. Marijuana is also the official word which students may have deemed more appropriate for an assessable curriculum task.

5.8 Theorizing cultural practices in society

In considering how practices operate in society and the students' representation thereof, the notion of social solidarity seems useful. According to Durkheim (1964), boundaries in society are established through solidarity and he provides two conceptual forms of this solidarity: mechanical and organic. Mechanical solidarity is based on a societal bond of sameness. In organic solidarity, the recognition of interdependence between individuals results in solidarity being achieved out of difference (Durkheim 1964: 149). Solidarity is not tangible and operates under legal codes of repressive sanction in the case of mechanical solidarity (based on punishment and shame), and restitutive sanction in organic solidarity (based on a need to restore homeostasis through internalized guilt). Mechanical solidarity operates with a condensed set of symbolic forms whose meanings are relatively unambiguous, whereas the symbols in organic solidarity are rather diffuse. The representation of the slaughtering of the goat seems to be predominantly one of mechanical solidarity: community, shared beliefs, unambiguous symbolic forms, and, if the ritual is followed, absolution from societal shame such as unplanned pregnancies and incest.

However, this notion of solidarity is rather a static account of how practices operate in society. Within highly valued and 'sacred' practices, different people or groups of people tend to attribute differing levels of importance to particular practices, and some of the students recognize that. For instance, the Goat group make an interesting point about the cultural change and shifts:

The younger generations, those that are educated, they are moving away from those things, but those who are staying there in the rural area, they are still believing that they think what they have is from their ancestors, so they have to thank their ancestors.
(Interview with Victor)

Here the student attributes the differences in views to a generation-specific interpretation of the practices surrounding the goat, and they contrast the youth's views with the elders' views, mentioning the effect of education on creating generational divides. This statement also contrasts 'rural' and 'urban' views, and discusses how traditions are transformed through processes of urbanization. Also, although the Goat poster represents men as 'the carriers of culture' in performing the act of slaughtering, the students repeatedly mentioned in conversations and interviews the strong role played by their grandmothers. These rifts in practice (generational, rural / urban, and gender) were the subject of classroom conversations, but were not overtly represented in the Goat poster. Rather, in the poster, a strong authorial

voice demonstrates the timelessness, idealization and 'given' nature of this practice and its meaning to all. The shifts across life worlds and domains of practice and the inevitable tensions that this creates are selected out of the representation.

In contrast, the tensions and rifts in cultural practice are specifically highlighted in the *Pants on Women* poster, and raised as points of debate. 'Modern' views are presented as well as more 'traditional' old-fashioned views; different cultural, religious and gendered perspectives are offered. These dimensions are obviously intertwined where tradition and certain reified conceptions of culture feed off each other (including the positioning of gender within particular cultural perspectives). However, the representation strives towards a consensus, with the emphasis on 'looking good' whilst 'maintaining a sense of propriety'. The kind of solidarity established here thus seems to be 'organic' in Durkheim's terms. Conformity to a collective norm seems to operate through internalized notions of appropriacy and propriety, rather than through external control and sanction.

De Certeau's notion of a cultural practice is perhaps useful in theorizing a more dynamic view of practices in society than Durkheim's notion of solidarity. De Certeau conceives of cultural practice as tradition which is reactualized in daily practice, and thus open to variation and contestation. He claims that day to day, ordinary usage leads to pluralization: "Ordinary culture hides a fundamental diversity of situations, interests, and contexts under the apparent repetition of objects that it uses" (De Certeau 1998: 256). So, although cultural practice may appear constant, timeless, and static, because it is a constant re-enactment, flux and change are inevitable. It could be argued that textual genres function in this way, the apparent repetition of the same form often hides diversity and the uniqueness of each individual act of interested sign-making.

The posters served to outline the shifts and contradictions in certain cultural practices and the nature of reality as social construct. The *Flowers* group talked of the construction of meaning, and culture propagating itself: "a certain society believed that if you give bright natural flowers to someone who is sick, he would recover. Automatically, this goes around from generation to generation and becomes an instinct of that culture, society, religion etc." (*Flowers* poster). This is an important point, as it highlights the fact that meanings are created to become the norm, they are not natural or given. In the *Pants on Women* poster, students reflect on the relativity of meaning in their emphasis on the appropriacy of women wearing

pants in particular contexts. They provide a historical and cross-cultural perspective, and place emphasis on the fact that what people wear is culturally determined and not some universalized 'norm'.

The students mentioned in their written reflections the importance of the project in alerting them to different norms, practices and beliefs across communities, and emphasized the importance of this in 'development' work.

I think one day I will be involved in a development project and will have to work with the community. I think to foster good communication I would have to have a perception of what the values of the people in community are. I have to have a grip of what is culturally unacceptable in that particular community to ensure that what I propose does not offend them.

(Phillip's written reflection)

This response shows how students are grappling with both their own experiences of reality and the realities of others in South Africa.

5.9 Final comments

Discourses are linked to value systems in particular contexts, and different discourses within a particular ideology can sometimes be opposing and contradictory, and can sometimes reinforce each other. Utopian discourse battles with the harsh realities of social life; the discourse of individualism contends with notions of collective responsibility (sometimes expressed as propriety). The discourse of propriety is closely intertwined with gender discourse and religious discourse: gender discourse polices women's bodies and how they are adorned; religious discourse polices societal behavior, as well as internal thought processes. It is clear that the Symbolic Object posters are dialogic in nature. The Goat poster is the least dialogic text of the three as conflict is erased in the representation and a timeless essence presented. The Flowers text is more dialogic in nature as all knowledge is presented as equal, with no conflict and no hierarchy. The Pants on Women poster is the most dialogic with conflict between the discourse of individualism and the discourse of propriety openly displayed.

Many of the discourses in the texts are students' primary discourses (and other kinds of secondary discourses) before these enter into dialogue with the discursive conventions of the engineering discipline. As mentioned in chapter two, Gough (2000) argues that the term 'secondary discourse' is often used to indicate 'English school education' and Western

rhetorical norms. Used in this way, the secondary discourses of other communities are ignored. The Symbolic Object project surfaced valued practices with fixed norms that require a secondary discourse, such as the practice of slaughtering a goat. However, the students do also draw on knowledge of scientific conventions and are aware of the constraints on representation which they perceive to be attendant on a task of this nature within a pedagogical domain of practice.

In the Symbolic Object posters, the students' processes of sign-making involved complex analogies and acts of classification, some of which are key features in scientific thinking. This analysis of students' textual productions has shown that the systems represented can include classification taxonomies, analytical and symbolic processes. Both the Goat and the Flowers posters are conceptual, representing participants in terms of a generalized and more or less stable essence. In the Pants on Women poster, there is a tension between 'change' and 'stasis': the individual as agent embodying change, or the collective as a 'conserving' force which perpetuates traditions and regulates individual freedoms through notions of propriety. The classification structure in the Pants on Women and Flowers posters are organized according to binaries. The concepts are classified according to abstract, generalizable meanings (both 'symbolic' and 'scientific' meanings) and context-specific meanings (such as 'cultural' meanings). The Goat poster is organized into analytical hierarchies. Actions over time are represented as spatial configurations and all elements are spatially co-present. Also, the different parts of the diagram have the roles of 'carrier' and 'attribute'. This distinction between 'carrier' and 'attribute' is a useful analytical tool for students of engineering where the relations between the whole and its parts, and how the parts fit together, is important to establish. The analytical hierarchies and systems of classification are a conceptual cognitive resource for students to draw on, although they may be modally changed in an engineering environment. Analyzing the Symbolic Object posters shows that students' capacity for this sort of conceptual work pre-dates the engineering curriculum.

During the Symbolic Object project, sharing of knowledge and the excitement generated around this sharing was tangible in the classroom. Bringing in different kinds of knowledge from different contexts also changed the power dynamics. I have argued that these shifts in power had an impact on authorial voice. This is evident in the interaction between the producer of the text and the represented participants, and the interaction between the producer

and the viewer. In all of these posters, strong authorial voice is maintained, even whilst the relativity of meaning is demonstrated and rhetorical counter-arguments are raised.

In conclusion, the Symbolic Object project opened up an opportunity for exchange of cultural and personal knowledge. An unregulated space was created where students could draw on a range of representational resources. By utilizing this range, and predominantly the visual mode, different competencies were allowed to emerge and be validated. The spatial organization of the visual, as opposed to the temporal organization of the written, afforded different opportunities for conceptual representation. Students could also utilize 'non-academic' but nevertheless secondary discourses, such as religion and propriety. They could mix primary discourses with a variety of secondary discourses in interesting and valid ways (as in scientific descriptions of spiritual processes) utilizing humour and irony.

Chapter Six: Use of Resources in Standard Academic Genres: The investigative report

6.1 Introduction

The next two chapters look at two textual productions, the written reports and the rural village posters, which are the culmination of the work on the Communication Course. In both the reports and the posters, the students propose suggestions for development of a particular rural area. The reports are individually written and the posters are produced in groups. As compared to the Symbolic Object project, the report and poster genres are both taught in a highly structured way, and the assessment stakes are high. Both the reports and the posters are regulated genres in the engineering discipline, although the posters are perhaps less regulated than the written reports, without the same degree of explicit instruction.

If texts are socially situated acts of semiosis, they are a function of their relation to the social context of use. Texts are therefore variable, but also in part predictable. This study looks at coding orientation, discourse and ways of organizing knowledge as descriptive and analytical categories which enable an analysis of textual variability. I look at the representational choices students make and the extent to which these match with what is valued in academic discourse and regulated academic genres.

In this chapter, I analyse the individually written reports within each group of students (Nobody Village, Efolweni Village, Ingogo Village), but also look at trends across all the reports. (See appendix three for one report from each group: Thabang's, Andrew's and Nandi's reports) The following table provides the focus and titles of the reports in each group. In the Ingogo Village group, I focus only on the reports of Phillip and Nandi, as Phillip obtained the highest grade, and Nandi the lowest.

Village	Students	Portfolio (title of report)
Nobody Village	Mthoko	Roads ('Road construction and Sustainable Development in Nobody Village')
	Thabang	Power ('Safe and Affordable Electricity in Nobody Village')
	Mbongiseni	Water and Sanitation ('A report prepared by Mbongiseni for Water and Sanitation project in Nobody Village, a village in the North West of Limpopo Province of South Africa')
Efolweni Village	Andrew	Water and Sanitation ('Improvement of water supply and sanitation systems at Folweni Area')

	Dizu	Housing ('Housing for Efolweni Village')
Ingogo Village	Phillip	Environment ('Possible Solutions to the Environmental Problems of Ingogo Village, KwaZulu Natal')
	Nandi	Water and sanitation ('Water supply and sanitation as a problem in rural areas of South Africa: An investigation of water supply and sanitation for Ingogo')
	Zodwa	Power ('Electrification of Ingogo village in KwaZulu Natal')
	Tumi	Housing ('An investigation into housing: Ingogo Village')

Table 8: Titles of students' reports

Generally speaking, across the reports, the ideational function highlights technicality and the interpersonal function is authoritative (the students are imparting, not negotiating information).

6.2 Investigative report as regulated genre

Since genre is about conventions at work in a domain of practice, particular meanings and relationships around meaning-making are privileged and regulated in academic genres. As mentioned in chapter two (section 2.5.2), regulation can be indirect where implicit assumptions are made, or direct where specific directions are given about textual production.

The report genre is taught explicitly on the course and the students can refer to a model report exemplifying the different sections on the website. This explicitness coheres with the notion of genre pedagogy outlined in chapter two (section 2.5.4). On the course, a distinction is drawn between the investigative report and the experimental report (such as a Physics laboratory report) because the experimental report is the other main genre of writing that the students encounter at this level of their studies. The main difference between the two types of reports is that the investigative report is evaluative (it outlines an issue, explores options to address that issue according to certain specified criteria, and makes certain recommendations); whereas the experimental report is descriptive (it describes the steps in an experimental process). One of the students commented on this difference in report genres: "The reports that I do in Physics and Chemistry do not have research. They are based on the facts of the experiment. They are not strict in terms of style and language".

The format of the investigative report has specified and defined sections: the terms of reference, synopsis, table of contents, introduction, findings, analysis and discussion, conclusions, recommendations, acknowledgements and bibliography. Attention is drawn to the type of language used in each section. For instance, it is suggested that the

'recommendations' be concise and specific, and written in point form. The construction of an argument is described in relation to the 'Analysis and Discussion' section. The use and function of logical connectors is highlighted, especially those that demonstrate process, cause and effect and deduction: 'consequently', 'furthermore', 'moreover', 'hence'. Consistency is advocated: consistent degrees of agency and authorial distance; consistent use of lexis from a specific domain rather than mixed domains.

6.3 Coding orientation

It emerges from the analysis that all the students' reports are a combination of the everyday and the technological; common sense knowledge and the systematized knowledge of engineering. These orientations form a hierarchical relationship in scientific discourse.

In the Nobody Village reports, there is slippage between the orientation towards the everyday (naturalistic coding orientation and social realism) and technological coding orientation, as evidenced in statements such as the following: "Transportation is not an easy thing to do because roads are full of dongas and during rain they are muddy" (Mthoko's report). The first clause begins with a nominal form, 'transportation' - a grammatical choice reflecting notions of scientific technological discourse, where a clause is changed into a noun and an activity is transformed into an object. 'Transportation' is then referred to as a 'thing', reflecting this transformation. The choice of the word 'thing' indicates an orientation towards the everyday. Similarly, the lexical choices of 'road', 'full' and 'muddy' reflect on everyday experience.

In contrast to the Nobody Village group, 'social realism' is the dominant orientation in the Efolweni Village reports, rather than technological. Social realism attempts to capture society 'the way it is'. It is realized in the report genre as description, and manifests in lexicogrammatical choices which are orientated towards the everyday. Andrew's report on Efolweni Village is mostly written in the active voice and there are few nominalizations. There is little lexical densification in this writing. As mentioned in chapter two (section 2.5.2) lexical density is the measure of the density of information in text, according to how tightly the lexical items have been packed into the grammatical structure (Halliday and Martin 1993: 76). Rather than lexical density, very long sentences are used with clauses combined by simple conjunctions, such as 'and'. The suggestions in Andrew's report are grounded in the context of the area and its needs, and there is a clear sense of the possibilities and the constraints of the suggestions. For example, the report argues that single taps per household

are difficult to implement because the haphazard arrangement of the houses creates difficulty in laying the pipes.

The written reports of the Ingogo Village group also tend to be oriented towards social realism. The content of Phillip's report is not technical and consequently the lexical choices are drawn mostly from the everyday rather than the technological domain. His report is written in the active voice. Linguistic form is used here for 'description': description of the village, its infrastructure and the functioning of systems. Similarly, Nandi's report is also oriented towards social realism: "Choosing the right technology is very important as many people tend to depend on water as it is the source on life". Here she uses active constructions; everyday lexis such as 'right' and colloquial, non-specific intensifiers like 'very' and 'many'.

I have argued that the dominant orientation in the students' reports is towards social realism, although the reports do combine both technological and naturalistic coding orientation. Social realism is largely realized through description. The orientation towards realism is understandable since the focus of the rural village research is on addressing particular needs in a particular context. However, it could indicate that students battle with the technical and abstract coding orientations that realize Western scientific discourse in the written mode. The orientation towards social realism could also mean that students are engaging with the issues in a personal rather than an abstracted way, and therefore the more dispassionate discourse of science is variably employed. In the next section of the chapter, I look at the extent to which students' representational choices match the features typical of Western scientific academic discourse (described in chapter two, section 2.5.3) and how students navigate agency and affect within the dominant discourse.

6.4 Scientific discourse

To a large extent, we can recognize that the students' reports are enacting 'engineering'. Halliday and Martin (1993) argue that the languages and discourses of science have characteristic features that have evolved to do various forms of cognitive and semiotic work which the 'common-sense' language of everyday life cannot do as well, including the representation of technicality and abstraction. The distinctive quality of the written mode in engineering lies in the lexicogrammar: the technical terminology and the technical grammar. As mentioned in chapter two (section 2.5.3), these features of engineering discourse are drawn from scientific discourse. Scientific discourse comprises scaffolding of deductive and

inductive reasoning, formulating hypotheses, making generalizations, identifying exceptions, connecting evidence, classifying, relating, organizing, planning and persuading. The students 'enact' some of the features of Western Anglophone scientific discourse to different degrees in their written reports. I am interested in the ways in which the students navigate these features, especially in terms of representational interest and agency (for instance, the use of local lexis in realizing scientific discourse).

6.4.1 Actualization of scientific discourse through different and 'local' lexical fields

Scientific academic discourse can be actualized differently in diverse lexical fields. For instance, Andrew (of Efolweni Village) and Mthoko and Thabang (of Nobody Village) reproduce scientific discourse in their writing, but this discourse is actualized through different lexis in the different reports. In Andrew's case, the writing is that of the everyday, whereas in Mthoko's and Thabang's cases, the writing displays more features typically associated with Western scientific discourse. Wellington and Osborne (2001) speak of a 'taxonomy' of words in science, including naming words, process words, concept words and mathematical symbols (20). The types of words that dominate in Andrew's report are naming words, drawn from the domain of the everyday, and not from the technical. The one 'concept word' that is used, 'temperature', is a sensory concept derived from experience. There are few nouns in his report denoting scientific processes: 'purification', 'decomposition', 'erosion'. Mthoko, on the other hand, utilizes a large number of naming words which are drawn from the technical domain. He speaks of 'bituminous surfacing' and 'sub-base, copping layer' when writing about road construction. These terms are referenced (acknowledged as not his own), but they are not explained in his text, thus remaining 'added on' instead of integrated in the way that Andrew's terms are. Thabang's naming words are largely drawn from the technical domain and include words such as 'turbines', 'biomass', 'methane' and 'atoms'. His process words include 'combustion', 'erosion' and 'extraction'.

Student interest motivates the choice of lexis, the taking of a discursive position, and it is important to think about what alternate choices could have been made. For instance, the use of local lexis in the reports. Mthoko writes: "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 results of soil erosion and the lexical choice here reflects on the local context. However, change in lexis here (to the 'local') does not necessarily produce a change in coding orientation. The term 'donga' could be seen as a technical term in this context. Here

Mthoko 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”. Phillip of Efolweni Village also uses the term ‘donga’:

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. (Phillip)

Andrew, however, talks of ‘furrows’ instead of dongas and Mbongiseni talks of ‘hollow roads’.

This degradation of the land by water resulted in some huge furrows being formed between the houses. (Andrew)

Gravel hollow roads usually damages cars. (Mbongiseni)

The terms ‘furrows’ and ‘hollow roads’ are both less precise than the local term ‘donga’ which is a more technical word in this context.

The local term for a hot wind is ‘berg wind’ and Nandi uses the term both descriptively and technically in her report. 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 results experiences orographic rainfalls (rain caused by the ascending of warm air). (Nandi)

The word ‘veldfire’ also appears in one of the reports.

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

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.

The local terms (donga, berg winds, veldfire) are not terms used in the curriculum, but the students chose them and used them appropriately to actualize the academic discourse of engineering and to point to precise shared meanings. These terms thus have high modality in a technical coding orientation. However, local lexis was also used with high modality in a social realist coding orientations, for instance, the term ‘shebeen’.

High violence rate because some people are bored and they end up in shebeens and because of this alcohol they end up committing violence. (Nandi)

Shebeens are informal places which sell alcohol and which have a particular resonance in different communities in South African society. The choice of the term 'shebeen' rather than a term like 'pub' or 'bar' points to the social aspects of alcohol and unemployment, often in the economically deprived areas of the country. It also perhaps signals the students' affiliation with these local words.

6.4.2 Nominalization: Processes into systems

Scientific discourse has evolved a form of clause construction that represents actions and events as if they were objects. This process of 'objectification' is often realized through nominalization. Nominalization allows scientific writing to invest most of its meaning in the noun (the prototypical realization of a thing) rather than the verb (the prototypical realization of a process). Nominalization is the shift or 'transformation' from clause to nominal.

Transformations are a set of operators on basic forms, deleting, substituting, combining, reordering a syntagm or its elements (Hodge and Kress 1993). In other words, a phenomenon of one kind is construed in a way that represents a phenomenon of some other kind. In the nominalization process, verbs are often recategorized into 'function' words rather than 'content' words. In the clauses that are thus constructed, the verbs used tend to become restricted to a set of logical connectors such as 'has', 'causes' and 'develops into' (Kress and Van Leeuwen 1996: 59). These logical connectors are routinely deployed and are an integral part of scientific and academic discourse.

Halliday and Martin (1993) argue that nominalization is one of the major sources of problems faced by those apprenticed to scientific discourse (by both English speakers and English additional language speakers). In the written reports, the students utilize nominalizations, which coincide with the canonical use to varying degrees. The students more successful in acquiring academic discourse are able to manage the objectification of process. Thabang produces simple but appropriate constructions: "The formation [of natural gases] still continues but it is negligible as compared to human extraction". Here 'form' and 'extract' are regrammaticalized as 'formation' and 'extraction', and these processes take on the semantic flavour of objects. Thus, these verbs become 'technologized' (Halliday and Martin 1983: 8) and there is a shift from the specific to the general, the concrete to the abstract.

The difficulty in attempting to ‘technologize’ words characterizes all the students’ reports. Mbongiseni recognizes the features of scientific discourse, but battles with the grammar of producing nominalizations. He writes: “The improvements and upgration have been a request from the village community”. Here he is experimenting with the transitions of words from verb to noun. This is sometimes a difficult process in a second language, and results in constructions such as ‘upgration’. Andrew speaks of ‘ensurity’ and ‘resistibility’

When talking about water reaching consumers under its normal conditions, we mean ... **the ensurity of maximum solubility of the purifying chemical reagents.** Humidity and Soil Temperature: these are the most essential factors that has to be considered when dealing with resistibility of the underground pipes. (Andrew, student’s own emphasis)

Mthoko combines ‘occasion’ and ‘occurrence’ in the word ‘occurtions’: “[loam gravel road] has been used in many occurtions like places where traffic is not too busey”.

Some students navigate academic writing by making minimal use of nominalization, such as Mthoko. He uses simple forms of the passive, such as:

“This report *was commissioned from ACE Trust*, in February 2002, for the research in *road construction ...*” (Mthoko, emphasis added)

In describing the advantages and disadvantages of different kinds of roads in Nobody Village, he does not use nominalization at all. He uses simple sentences beginning with the subject ‘it’, followed by a verb to be or in the active form, such as ‘is’, ‘flattens’, ‘develops’.

It is strong in the same way as bitumen road.

It develops some cracks when it is constructed in a damp place. (Mthoko)

These sentences perform classificational operations which are realized through relational models. Mthoko’s use of the *noun + ‘is’ + noun* relational form allows him to establish relations between various categories and to articulate the logic of a system. His use of the *noun + ‘is’ + adjective* relational form allows attributes to be linked to an entity in an activity of judgment, for example: “It is strong”. In general, Mthoko’s non-use of nominalizations allows his writing to retain a firm grip on the processes in his world, although writing based on simple sentences may limit extended discursive writing or complex analysis.

6.4.3 Dialogic texts: Agency and affect

As argued in chapter two (section 2.5.3), exploring students’ meaning-making activities means acknowledging the jostling of privileged discourses against marginalised or oppositional discourses. Text is the site where discourses are materially realized and brought

into alignment to create some kind of whole. The ensembles of discourses selected in text reflect an ideological position. As mentioned above, the orientation of the students' texts is located on a continuum from the everyday ('common sense' knowledge or 'non-privileged' knowledge) to the abstracted, systematized knowledge of engineering. Within individual texts, the discourses which realize these different orientations jostle against each other. The moments of dialogic rub are evident in both the content and the lexicogrammatical constructions. These moments often revolve around agency (degrees of authorial distance from the subject matter) and affect (degrees of engagement; degrees of evaluation).

6.4.3.1 Agency

Removal of authorial agency is one feature of authorial distance. The deletion of the agent is a common feature of nominalizations and agentless passives, although the agents do not have to be identical to the author. In nominalizations, although we know that there has been an actor and an affected, the specific identities of both have been lost. Nominalizations are the "results of deletions of participants and contexts to create a world of reified entities" (Hodge and Kress 1993:69). The nominalizations in Andrew's report (Efolweni Village) are structured in the *noun + of + noun* form. For example,

The maintenance of healthy, adequate resources
The relation of these resources to the land infrastructure
The provision of safe drinking water supply
Degradation of the land by water (Andrew)

In the transformation to the nominal form, processes like 'maintaining', 'providing', 'degrading' and 'terminating' are transformed into systems: 'maintenance', 'provision', 'degradation' and 'termination'. These nominalizations are used in the same way that some of the agentless passives are used, namely to remove the visibility of the author and the engineers as agents.

Scientific discourse is realized through both agentive passives (X is -ed by Y) and agentless passives (X is -ed). In the agentless passive form, agency is removed and an authorial distance created. When the process or object is foregrounded, rather than the agent, the agent is often discarded altogether: "About 200 stand taps were suggested to be installed" (Mbongiseni). This passive transformation inverts the order of actor and affected. Here the 'stand taps' are foregrounded as the subject of the sentence, and 'suggested' and the agency it

implies is not emphasized. Basic passive constructions such as the following are common in the reports:

After considering advantages and disadvantages of 3 kinds of roads, quality concrete road was found to [be] suitable for the development of Nobody Village. (Mthoko)

Other common constructions across the reports include: “The methods investigated are ...” (Thabang); “The report was commissioned ...” (Nandi).

In Andrew’s report (Efolweni Village), the writing does not foreground the team of consultants or the student as researcher. Agentless passives are used in the synopsis, and the students as researchers are backgrounded.

The research is made on the basis of the land deteriorating factors, and then from there the considerations are made of the new sustainable resources that can withstand the unfavourable conditions. (Andrew)

Yet, the writing has a strong authorial presence. Authority is established through controlled statements which use sentences with the verb ‘to be’, clauses such as “it is preferable to”, minimal hedging and tentative modals. Examples of these statements are:

The only way of doing this is by implementing some toilets in the area
It is therefore preferable to implement the 2m-by-2m types.
No sophisticated materials can be used. (Andrew)

The students use a combination of the passive forms in order to foreground process, without necessarily removing agency from themselves or from the villagers. The grammatical awkwardness of some of the passive constructions is a result of these sometimes conflicting agendas. The writing in Mthoko’s report vacillates between removing agency completely and instituting some record of active decision-making: “Nobody and Co. consultants found it to be better if a research is made about a kind of road which can be constructed in Nobody Village.” Although two agentless passives are embedded in this sentence (“research is made” and “can be constructed”), these are framed by the opinions of the actors ‘Nobody and Co. consultants’ which are foregrounded. The same vacillation of agency is evident in Mbongiseni’s report, where he switches between focus on process and focus on agency: “More water supply systems are required in the village as requested by the village inhabitants”. The grammatical difficulty in this sentence construction could be because Mbongiseni realizes the need to remove agency, but wants to keep a human face on the development and to demonstrate that it is the villagers themselves who have requested this

development. The team of consultants are represented as having “decided to upgrade the conditions regarding water and sanitation in Nobody Village”, thus producing a strong sense of agency and authorial proximity. Here involvement in rural development is represented as an active choice rather than a passive construction of having “been commissioned” to do the work. Certain kinds of agents are consistently mentioned across the reports. These are either the different technologies, the village or villagers or the group of engineering consultants.

In the absence of humans as agents, objects or technologies become the subject of the sentences, such as water, water tanks, water taps and water pipes.

The underground-buried water pipes were extracted from the soil by the powerful water streams. (Andrew)

The 2m-by-2m type of toilets are fundamental because they can save a lot of space as well as the building material. (Andrew)

In the above quote, the toilets are the agents. The rural village also forms the subject of numerous sentences. In Andrew’s report, the section ‘Description of Folweni¹ area’ starts with the village as the subject of sentences, and natural resources as agents (‘soil erosion and floods’, ‘water’, ‘water streams’). In his report, the village is referred to as ‘Efolweni’ and, more commonly, ‘the place’.

The place is now poorly supplied with water (**lorries are used for supply**) and people are not comfortable about this type of service since they have to pay for each bucket of water loaded... It’s even worse when it comes to sanitation because there’ve never been any proper toilets built there, the ones that are existing are just enough for the users not to be seen by other people, otherwise they are the other source of litter in the area. (Andrew, students’ own emphasis)

There is an interesting shift in the above extract from the focus on the place as geographical location to a focus on the people. Along with this shift in focus to the people of the village comes a more informal lexis (contractions like ‘it’s’, ‘there’ve’; intensifiers like ‘even’, ‘just’; evaluative terms like ‘worse’.)

In Phillip’s report on Ingogo Village the student engineering consultants are the agents. Most statements are written in the active voice and the few which are written in the passive take the agentive form: “Methods of conservation were thoroughly investigated by the Ingogo Expert Consultants”. The use of the passive here foregrounds the process whilst ensuring that the

¹ Here the prefix ‘e’ in Efolweni has been dropped because it means ‘at’ in the locative construction in the Xhosa language.

agent ('Ingogo Expert Consultants') remains. A strong sense of agency is evident in the report in general. One of the sections is entitled: "Options we are going to investigate". Here the consultants are represented as active agents in the process of investigation and development. The engineering students are referred to as 'we' throughout.

The village of Ingogo was of great help in finding out some aspects about this village and how we as development consultants could come up with a strategy to improve the lifestyles of these people. We couldn't find out everything about the village, but all the information we have at hand is sufficient to proceed with the development.
(Phillip)

Here the 'we' is exclusive and refers to the engineers.

I have argued that the passive forms are employed in variable ways in the students' reports, to create degrees of authorial distance from the represented subject matter. Now I will look at the degrees of engagement and evaluation in the reports.

6.4.3.2 Affect: Engagement and evaluation

In the written reports, engagement is actualized through typographical choices, grammatical constructions, and lexical choices. The students commonly used bold or italics as a signifier of importance. For example, Andrew uses italics for emphasis: "The place is suffering from poor supply of water (*a major resource in life*)". The shift to the present continuous tense here (from the simple present) indicates that the suffering is happening now, even as the author writes the report. The choice of a word like 'suffering' refers to emotional lexis; it is a particular selection from a particular domain. 'Suffering' has provenance in religious and literary genres of a certain kind as well as ordinary everyday life. Although this shift in lexis is unusual in the Western scientific discourse of tertiary institutions, it is not necessarily an indicator of a shift in discourse, but rather point to the influence or 'trace' of another discourse. Instead of the word 'suffering', the student could have used an expression like 'disadvantaged', 'lack of' or 'ill supplied'. Each of these words indicates a different discursive provenance.

There are moments in Mthoko's report where a strong sense of engagement is evident. These moments reveal traces of other discourses within the dominant scientific discourse:

"It is *much* difficult to *accept* how conditions of roads in Nobody are *retarding* the pace of business effectiveness...the condition of those dongas and muddy road is *disturbing* the pace of business" (Mthoko, emphasis added).

In a report that uses hardly any adverbs, the student uses a strong modal ‘much’ to emphasize the strength of the statement. The use of the present continuous tense emphasizes a sense of immediacy – these things are happening at the moment, not in some abstracted time frame. The words ‘retarding’ and ‘disturbing’ are adjectives with emotional valency, although these words as signs are more commonly employed in scientific discourse than a word like ‘suffering’. In using a term with strong modal import, like ‘retarding’, the case for non-acceptance of these conditions is strengthened. The notion of ‘acceptance’ here is an implied call for action to change the existing conditions of the roads. The use of the active form allows this writing to maintain a firm grip on the processes in the world described here, which is a necessary basis for practical action. The strong modals, the present continuous tense, emotional lexis, and the active form contribute to the accumulated effect of this statement, which is largely a political campaign to bring about change to alleviate existing conditions. The strength of Mthoko’s engagement could be due to the fact that he grew up in the village which he is investigating, Nobody Village, and has personally experienced the “retarding” effect of the poor infrastructure.

Degrees of evaluation in the written mode are established through the use of adjectives or transformationally derived adjectives, as well as adverbs. The reports differ in their degrees of evaluation depending on the degree of authorial presence in the texts. Some reports contain almost no evaluating terms (like Mthoko’s); others tend to evaluate and appraise, but in different ways and to varying degrees. Phillip’s report is without evaluative terms, but engagement is realized through punctuation – the use of an exclamation mark:

Some of the families have to try to survive with very little income, e.g. R350 per family of approx. 7 people! (Phillip)

In the reports, grammatical choices are made to represent evaluative qualities in a ‘technologized’ way, so the adjective ‘efficient’ becomes the abstraction, ‘efficiency’ (in the reports of Phillip, Mbongiseni and Andrew). The term ‘efficiency’ points to the discursive provenance of economics: ‘Technology has improved production efficiency’ (Thabang). Thus, evaluation becomes an abstraction and a timeless truth without context. Turning attitudes into abstract qualities is one way of sounding objective while still presenting a point of view.

A description in Mbongiseni’s report is coupled with evaluation and appraisal.

This project will mainly focus on the redesigning of water systems made from locally available materials than can be used by local craftsmen. This will work well since will be fine-tuned to the local area, its people and its craftsmen's capabilities. (Mbongiseni)

Instead of letting the match of suggestion to criteria (local materials, local development, cost effective) speak for itself, he passes evaluative comment on how good this will be for the area and its people, using the evaluative adverb 'well' and the adjective 'fine-tuned'. Andrew of Efolweni also engages in evaluation in instances like the following: "It is therefore clever to have the branched distributing pipes ... at the far end of the main pipe". Here the attributive model expresses the act of judgement: "It is clever".

I have attempted to demonstrate the ways in which the students navigated dominant scientific discourse by utilizing varying degrees of agency, authorial distance and affect. The engineering discipline is well-placed to bring different discourses alive, as it is premised on the engagement with the material conditions of people's lived lives. In this Communication course, for instance, the conditions of poverty are seen as a 'given'. Now I will examine the ways in which the students navigate the discourses of 'development' in the report.

6.5 Perspectives on development in students' reports

Some discourses of development are participatory and inclusive, whilst others are authoritarian and uni-directional. These contradictory discourses are often propagated simultaneously. The range of discourses that the students produce encompass economics, charity, environmentalism and gender, and these discourses are in conflict at times. For instance, Western 'aid' could be seen as just another form of economic exploitation and control. Also, the students' reports espouse participation and inclusion, whilst simultaneously creating a distance between engineers and villagers through authoritarian and uni-directional discursive constructions. In looking at the perspectives on development espoused in the students' reports, I will shift from description of students' representational resources to interpretation and commentary on textual meaning.

Much of the writing in Mbongiseni's report (Nobody Village) has democratic aspirations, emphasizing the participation of the villagers in the process. However, uneasiness about 'us' and 'them' is revealed in the dialogism evident in his report. The engineers are clearly constructed as 'us': "Few workmen in the village will be elected to help us in the process". In Mbongiseni's report, the writing is personalized through the possessive pronoun: "In relation

to our Nobody ...” Familiarity and affection are evident here, along with possible traces of condescension. Compare this use of ‘our’ to the following use in Thabang’s report:

We can see that the coal has been the major source of electricity in our country and one can think that using coal to produce electricity is much better and possibly cheaper because of it’s abundance in our country. (Thabang)

He refers to ‘our country’ in an inclusive way which differs from Mbongiseni’s use of ‘our Nobody’.

At times in Mbongiseni’s report there is a blurring between the roles of engineers and the roles of villagers, and sometimes a clear divide is highlighted where the engineers are constructed as ‘solving’ the villagers’ problems. The blurring of identity between the ‘engineers’ and the ‘villagers’ is indicated in the following quote: “The stand taps (standpipes) and windmills were the main suggestions by the villagers to solve the problem of water in the area.” Perhaps the intention here is to say that after discussion with the villagers, the following suggestions were put forward. Another example of this is the following:

After the villagers had had a chance to explore their village, It was suggested that domestic animals should be moved away from near the houses to the own places. (Mbongiseni)

Here the agent is ambiguous. It is unclear whether the villagers or the engineers made the suggestion. Perhaps this ambiguity of roles reflects on Mbongiseni’s emerging identity as an engineer, but also the identity of someone who comes from a rural area himself (from KwaNdebele in Mpumalanga). This straddling and shifting of identities must be a common experience for first year students.

The dialogic nature of Mbongiseni’s text is evident in the following statement:

Some of the villagers are catching sickness from the domestic animals like chicken and cattle, so it was suggested that they *must* be moved to their own areas. (Mbongiseni, emphasis added)

There are two separate clauses here: “it was suggested that” and “they must be moved to their own areas”. The first one suggests and the second one commands. It would thus appear that a ‘suggestion’ is in fact a ‘command’ here, thus conflicting with the democratic aspirations of the writing. However, the force of the statement is not that of a strong command. In order to establish the force of a command, one needs to make inferences about who the speaker is. Here, the student lacks the authority to create command, even if the lexicogrammatical construction points to an authoritative position (for instance, the use of the agentless passive

form: “it was suggested that ...”). It is worth noting that, in general, EAL speakers in South Africa tend to battle in choosing appropriate modal auxiliary verbs (Lass 2002). ‘Must’ here actually has the modality of ‘should’, and the student could be using it in a way that is typically South African, namely with low modality. Lass has described this feature of South African English amongst first language speakers as well. In other instances in the report, the writer translates uncertainty about status in the power situation into uncertainty about the status of his utterances, and utilizes many tentative modals.

There is a suggestion in Mbongiseni’s report that fines be imposed for non-compliance in keeping the areas around stand taps clean. The ‘findings’ in Mbongiseni’s report are largely stated with the force of commands, using strong modals (‘must’ and ‘will’), and the agentless passive form. “The windmills *must* be installed ...” and “The river ... *will* be diverted”. In the imperative, the actor is deleted from the surface of the utterance through the third person non-transactive. Stating the findings in this way projects certain social relations between the villagers and the engineers.

There appear to be ambivalent representations of the villagers and their role in development in the Efolweni village reports as well. On the one hand, participatory and inclusive processes are emphasized; on the other hand, the villagers are represented as incapable of working on their own without the support of ‘outsiders’.

Meetings should be held with the residents of the area, so as to ensure that the residents and their organizations that serve them, are given an opportunity to speak for themselves and to be involved in the development strategies that affect the quality of their lives. (Andrew)

This statement appears to be highlighting the importance of including the residents of the village in the processes of development. However, there does seem to be an implication that development will go ahead, whether the villagers are involved or not. Later, Andrew states that the construction work should be offered to already qualified resident; there is no space for or consideration given to training local people, and ‘developing’ the community. In this position, there is still a sense of ‘development’ as something occurring from ‘outside’ the village.

The overall orientation of Andrew’s conclusion seems to be that the engineers will ‘solve’ the problems of the village.

The effectiveness of the resources that are to be implemented depends on how the Folweni society is committing itself on collaborating with the assisting group of engineers. No reliable actions can be made by the residents' organizations or residents themselves on their own, because the connections to the organizers of the outstanding development companies in industry, require the skills and knowledge on how to express the problems, solution strategies, expected outcomes as well as expenses involved for the development of a particular area. These requirements can only be met if there is an assisting group of engineers or any other sort of volunteers from industry, who are well trained for canvassing. (Andrew)

Here the importance of the engineers and villagers working together in a mutually beneficial way is emphasized. The engineers are posited as 'mediators' between the villagers and the outside companies. The collaboration of the villagers is deemed essential, but the limits of the community working without support are also highlighted. This point of view is achieved through the ideational function of the conclusion, as well as the interpersonal and textual functions. In the sentence "No reliable actions can be made by the residents' organizations or residents themselves on their own...", an agentive passive is used where "no reliable actions" becomes foregrounded, and a weak link is established between the residents' organizations and the verb (joined by the preposition 'by'). The redundant reflexivity of 'residents themselves on their own' serves to emphasize the writer's point that the villagers cannot undertake innovations on their own. In the extract as a whole, the use of nominal forms ('effectiveness', 'connections', 'development') and the agentless passive ("These requirements can only be met if ...") serve to create a timeless, authoritative view. The grammatical choices function to construct this view of the villagers as the 'norm' and to obfuscate the fact that the 'realism' portrayed here is a social construct.

In the Ingogo Village reports, interesting perspectives on development emerge. In Phillip's report (Ingogo), the contradictions, complementarities and differences between discourses are evident. He appears to set up a participatory framework between the villagers and the engineers.

The village of Ingogo was of great help in finding out some aspects about this village and how we as development consultants could come up with a strategy to improve the lifestyles of these people. (Phillip)

Although community involvement is acknowledged, this involvement is represented as simply providing information on the village, rather than involvement in the processes of development of the 'strategy'. This latter process is represented as the domain of the engineers. The 'we' is an exclusive one which excludes the villagers and aligns the writer

with the engineers. Within a social realist coding orientation, 'realism' and the 'norm' are constructed in terms of social organization; particularly in terms of who may and who may not participate. However, overall, Phillip's report does tend to emphasize participation and the communal more than the other reports. He suggests that,

communal gardens could be of great help to the villagers. The people of the village get to encourage one another, exchange ideas and share resources. (Phillip)

Here there is a shift from the gardens as the subject, to the villagers. The phrase 'the people of the village' becomes the subject of the sentence, and they are posited as active in encouraging, exchanging and sharing.

Nandi of Ingogo Village writes: "The Ingogo consultant were willing to try their best and help this village". This statement espouses a notion of development as 'help' which is a uni-directional process, rather than a process that combines both the local and the imported; the internal and the external. Nandi also sets up a link between education and ability. She writes: "Most of the villagers are inadequately educated, hence they lack skills". The emphasis here is on 'lack' which was one of the main concepts to emerge in students' definitions of 'rural' (discussed in chapter 3, section 3.3.1). Nandi has a clear idea of what she considers to be a 'toilet' and for her the existing toilets in the village do not comply: "The are no toilets ... Villagers still use the underground toilets which are not environmental friendly they attract flies and they smell a lot". The choice of the modifier 'still' here indicates an implied idea of development – that these types of toilets are unacceptable and they need to change in order for development to take place. Nandi describes the village as having a large population: "The village has a high population with high unemployment rates, poor standards of living, poor education facilities". Yet, later, she writes that the population of the village is 500 people. Perhaps the above statement reveals something about her assumption that overpopulation is connected with the social ills that she lists. Phillip speaks of development as a move away from the traditional:

Traditional management systems, an increase in the village population coupled with a free market approach can put an end to some [harmful] traditional practices.
(Phillip)

The use of the modal auxiliary 'can' here is ambiguous about the nature of authority. 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'. However, the use of 'can' here could also be a second language equivalent as there is diversity in the extent

to which students are competent in English. As an aside, it is interesting to note that in contrast to Nandi's views, Phillip sees population growth as a positive for the village.

Although the course emphasizes sustainable development arising out of communities (discussed in chapter three, section 3.4.1), the reports reveal a range of perspectives on rural development and individual texts are often shot through with internal contradictions. So, inclusion in democratic processes is emphasized whilst couched in an 'us' and 'them' orientation, or in condescending discursive structures. Development as organically arising out of local needs and resources to ensure sustainability is juxtaposed with a notion of development as 'aid' or 'help' – something that comes from outside a particular community. Development as 'modernization' and 'westernization' co-exists with notions of embracing local and indigenous knowledges and structures.

6.6 Ways of organizing knowledge

In looking at the ways of organizing knowledge in the reports, I focus on how argument is formulated, the use of procedural structures and description and how information is classified and ordered.

6.6.1 The structure of argument

There are two main forms of argument operating in the reports. The one form involves specifying criteria for development and then judging certain technical options for their 'fit' to these criteria. The second form operates on a cause and effect logic (if X then Y). The model essays suggested the first form of argument.

6.6.1.1 Objective weighing up of criteria

The underlying logic and organizing structure of most of the written reports is the objective weighing up of a range of options against certain criteria. As discussed in chapter two (section 2.5.3), this form of argument is a key feature of the engineering discipline and was explicitly taught on the course. In order to weigh up criteria, the language of evaluation is used. Logical connectors like 'therefore', 'furthermore' and 'despite' are used, as well as conditional constructions like "if ... they might ..." (Phillip's report). This way of arguing links the general to the context-specific, and in this link, the constraints of the proposals are necessarily emphasized. So, for instance, Mbongiseni of Nobody suggests stand taps as a solution for the water supply to the village "since they are not accompanied by noise,

affordable, usable and fine tuned to the this area and its inhabitants”.

Thabang of Nobody emphasizes as his criteria for development: safety, environmental friendliness, accessibility and cost effectiveness.

The development of the village will be based on the following criteria:

- supply safe and affordable electricity to the residents and the environment
 - supply clean and environmentally friendly electricity
 - sources of electricity must be easily accessed and be at the reasonable price
- (Thabang)

Cost effectiveness is a key criterion that most students took into consideration. In the following extract Andrew argues for the use of durable materials, using the cost effectiveness criterion:

The durability of the pipe material is therefore an important factor since these pipes are very much expensive. When the material is much corrosive, it will be meaning that a lot of money will have to be spent on a short term capital , which consequently has a negative effect on the countries economy. A qualitative material will therefore have to be used for these types of pipes. (Andrew, student’s own emphasis)

Here the student makes use of logical connectors such as ‘consequently’ and ‘therefore’ in order to construct the argument for the use of quality materials. He transforms adjectives, attempting to ‘technologize’ words (‘qualitative material’) and in the process obscures their meaning.

The emphasis on criteria in the reports leads to a focus on context, as well as on ‘constraints’. The pragmatism of suggestions is variable, both in terms of relevance to context and the degree of recognition of the constraints on the suggestions.

6.6.1.2 Logic of cause and effect

Sustained argument in the form of evaluation of technologies against specified criteria is largely absent from Nandi’s report (Ingogo Village). Rather, her argument is structured according to a logic of cause and effect. Examples of these cause and effect assumptions in the report are that if the land is not over-cultivated, the result will be ground water availability; if the conditions in the village are improved, urbanization and rural depopulation will be prevented.

In order to prevent urbanization and rural depopulation which result in uncontrolled consequences such as crime, policing problem, unemployment, congestion and family disruptions rural areas such as this village must be improved so as to prevent the consequences stated above. (Nandi)

Nandi uses a strong modal, 'must', when talking about the need to prevent this situation. She emphasizes the social problems of urban crowding, and thinks about development from a macro perspective (relating the particular case to the larger context of South Africa). She specifies the social problems of the village as she sees them: "High violence rate because some people are bored and they end up in shebeens and because of this alcohol they end up committing violence". Again, a cause and effect logic is operating here: unemployment leads to 'boredom' which leads to alcohol abuse and violence.

To summarize, argument in these reports is structured along the lines of weighing up options against criteria and a cause and effect logic. Both of these forms of argument are crucial in scientific academic discourse, and the students master them with varying degrees of success. The specifying of criteria was emphasized on the course, whereas cause and effect logic was less explicitly taught.

6.6.2 Procedure and description

'Procedure' and 'description' are key forms in engineering genres. They are textual categories that project and construct a certain social relation. The closest type of factual writing to narrative is procedural writing. Like narrative, procedural texts are built up around a sequence of events, and describe how things get done. Unlike sequence, where temporality mirrors chronological sequence in reality, the task imposes order on the sequence in procedure. The notions of sequence, chronology and causality are key ideas underlying science (i.e. the notion that one event causes another). In narrative there are essential elements such as plot, scene, agents and sense of audience, although some of these elements are removed from standard scientific texts. There seemed to be some blurring of the boundaries between scientific argument or narrative in students' texts. In Mthoko's introduction, the aim of investigating three kinds of roads is stated, but the roads are not specifically named, nor the recommendations for development specified. This lack of divulgence of the content or the recommendations of the report is perhaps the result of some kind of 'interference' with certain versions of narrative where the key information is held back, only to be revealed at the end. Up-fronting this information would mean 'giving it away' and losing the narrative tension.

Descriptions are about 'what things are like'. The students' reports say how and what, but do not necessarily answer the question 'why'. Causal relations are rare in descriptions and procedures (Martin 1989: 11). An example of descriptive writing is Mbongiseni's explanation of how a windmill works:

Windmill uses kinetic energy to pump out water from the earth surface. Most wind pumps are a horizontal axis wind turbines with a tail vane to point into the wind direction. These windmills have rotor which has six-twenty-four blades. When these rotor are exposed to wind they start turning creating rotating shaft power. A pump is coupled to the rotor and uses the shaft power to pump water from the ground.
(Mbongiseni)

In Andrew's written report, procedural processes are largely absent and the structure is 'descriptive'. The descriptive structure here outlines systems, such as the laying of the pipes and their resistance to environmental factors. Although Andrew's report is more a description of systems, there are short procedures embedded in the descriptions. For instance, the following procedural piece about the filling up of the toilet system:

How long does it take for a hole to get full?
After about 10 – 15 years the hole fills up. Another hole is then dug by its side and the connection is given from the ceramic toilet basin to the new hole. Thus the toilet room/ make-shift hay room is left untouched. At a convenient time the filled up hole is emptied since the stuff in it would have decayed into sweet smelling organic manure, repaired and reused when the new hole fills up. (Andrew)

Expressions of time dominate in this extract: 'how long', 'after about 10-15 years', 'then', 'at a convenient time', 'when'. The procedural structure is realized through naturalistic coding orientation, with concrete and material processes, in the lexical and grammatical constructions of the everyday. Choice of lexis like 'hole', 'stuff' and 'sweet' point to this common, everyday quality. The places, things, and actions in this extract are general, so the verbs are all timeless, referring not to what someone did, or is doing, or will do, but to what they do in general.

6.6.3 Conceptual framework: Classification hierarchies

All of the reports make use of a system of numbering, of headings and sub-headings, to indicate a classificational hierarchy. The underlying structure of Nandi's report reveals difficulties in dividing and subdividing information into hierarchies and classificational taxonomies. The following is an extract from her table of contents:

- 2.4.1 Water supply
 - 2.4.1.1 Boreholes
 - 2.4.1.2 Wind and electric pumps

2.4.1.3 Storage dams
1.2.4.1.4 Cultivation

(Nandi)

The first two sub-headings deal with water supply (boreholes and pumps), but the third is about water storage (dams), and the fourth is about planting more trees (which the student indirectly links to 'water supply' as she tries to make a case for *not* cultivating all the land in order to increase the availability of the ground water). The table of contents indicates her difficulties in classifying information, resulting in repetition, problematic hierarchies and confused numbering. These difficulties manifest in the numbering system, as well as the classification of information under particular headings and sub-headings.

Although not taught on the Communication course, all the reports make use of point form to organize knowledge through lists. These lists include the aims of the project, the criteria, the advantages and disadvantages of proposed technologies. The brevity of point form has provenance in scientific textbooks and in commercial genres where 'time is money'. A 'point form' structure enables a particular kind of knowledge to be produced, that which is able to be segmented and compartmentalized into discrete units. This is a different kind of affordance to that of argument, where the knowledge produced is about the connections between elements. As I have argued above, the connections between elements include those established between discrete units of knowledge as they are evaluated against particular criteria, as well as the connections established through the logic of cause and effect.

In Nandi's report, point form works against sustained argument. So, instead of arguing for or against a particular technology in relation to specified criteria, a decontextualized list is created. Point form is used to list the advantages and the disadvantages, whereas the rest of the report comprises very long sentences.

2.4.1 Boreholes this can be used to uplift the groundwater

Advantages: less expensive
Easily installed
Existing infrastructure

Disadvantages: Are built close to each other (Nandi)

The lack of argument here reduces the meaning import of these lists (Less expensive than what? What does 'existing infrastructure' mean? What is built close together?) The incomprehensibility of these lists also points to EAL issues for Nandi. Point form may be

seen as a way of negotiating EAL difficulties. However, in this case, meaning is obscured even more due to the cryptic form.

Point form used without numbers tends to reduce hierarchies, acting as a leveller of categories. In this way, a list of advantages for loam-gravel road in Mthoko's report is not hierarchized:

- It is not expensive because its cost is lower than that of bitumen and quality concrete
- It can resist hot and cold conditions because of its ceramic nature
- It flattens the tyres after a long period because its surface has less friction with the tire (Mthoko)

Although the rhetorical purpose here is evaluation, the flattened hierarchy and the cryptic nature of the abbreviated point form result more in a list of equivalent facts than a progressive argument.

Analytical hierarchies are largely absent in Andrew's report. The 'flatness' of categories is not realized through a point form structure (as in Mthoko's report), but through descriptive and discursive writing (utilizing extensive paragraphs). The only classificational hierarchy in Andrew's report is the conceptual pattern dividing the whole into parts. The concept of 'water supply' is divided into storage, conveyance and distribution (storage tanks, water pipes, taps). Phillip's report is also organized according to a part / whole structure. The concept of 'environment' is seen as including water storage, renewable energy, community gardens and combating of soil erosion. In Phillip's report, the conceptual pattern of the parts being related to the whole is realized through headings and sub-headings which form classificational taxonomies.

The ordering of the different elements in Mbongiseni's report does not match that of the standard report. The contents page is placed before the synopsis. Also, the 'recommendations' are placed under the 'findings' section before the details of the different options are presented and discussed. Having difficulty with the ordering of the different elements of the report is partly a result of lack of familiarity with generic conventions, although these were taught on the course. This difficulty is also partly epistemological. Mbongiseni, for instance, compares two completely different things, which are not comparable as they do not share an underlying classification; they are not of the same 'group'. He confuses water source and water supply and attempts to compare windmills and stand taps:

“According to these discussions and investigations, 5 windmills can be installed in Nobody ... However standpipes are the most effective ways of supplying water to the community.” This could also be an EAL problem where the logical connector ‘however’ may have been used incorrectly to establish a comparison when perhaps that was not what the student intended.

6.7 Word-processing as design

Written text is also a process of visual design as on-line texts tend to be graphically rich, customisable and publishable. Technologies such as word processing, page design software, and laser printers put a new premium on visual design and “spread the responsibility for the visual much more broadly than was the case when writing and page layout were separate trades” (NLG 2000: 29). Students can, for example, determine their own page layout, font size and type, paragraphing, indenting, use of bullet points and spacing of lines. Visually informed writing “encourages the writer to be exact about grouping related ideas, delineating beginnings and endings, and using cues to signal to the reader a graphic representation of cognitive organization” (Bernhardt 1986 in Markel 1998: 381).

When computer competence and academic literacy practices stumble upon each other, they can sometimes work at odds. Competence in exploiting the resources of a particular medium does not mean appropriate use of those resources in specific contexts. A student like Thabang exploits the resources that word processing has to offer, making his report a carefully ‘designed’ text, even if not entirely appropriate in scientific discourse. He uses image banks to design the cover page. The predominant feature of this is a light bulb signifying power, as well as ‘enlightenment’ and ‘development’. The border of the cover page comprises repetition of the earth’s globe, perhaps representing the linking of Nobody Village to the global. Thabang also constructs tables, inserts pictures and experiments with different fonts (the headings are written in courier font, the content of the report is written in Times New Roman).

The downside of writing in this medium is that lack of technological proficiency affects textual production. Some of the common problems with the basic mechanics of using the keyboard include: full stops in the middle of sentences, repetition of phrases, different fonts used incongruously, use of the tab key in aligning the page number in the table of contents, letters switched around or left out and changes in font size mid-sentence. On-line documents

are malleable. It is possible to cut and paste, insert and delete text, thus careful editing becomes crucial. For instance, Phillip left parts of the 'report template' in his document: 'Author, date, name of website, URL, date accessed'. Nandi leaves spaces before commas and full stops in her report. Perhaps this has less to do with her adeptness at manipulating the keyboard, than her unfamiliarity with typographic conventions. Inconsistencies of font are often evident in sections which have been cut and pasted from elsewhere (normally the references in the bibliography).

In some of the reports, the move from writing on-screen to the paper-based text led to some vestiges of spatial design remaining in the written text. The students tended to organize their writing as a visual entity on screen, and not as a paper-based product or 'document'. For instance, there are many open spaces, inconsistent use of font types and font sizes and hyperlinks like 'Back to top' left in the final documents (as in Dizu's report on Efolweni Village).

6.8 Authorial voice and degrees of abstraction: Reconciling experiential knowledge with researched knowledge

According to Gee, the author is down played in academic discourse "since the process of writing and editing essayist texts leads to an effacement of individual and idiosyncratic identity" (1990: 63). However, it is clear that students have negotiated complex identity positions in their writing in relation to variable degrees of agency and affect. For instance, Thabang of the Nobody group manages an adept mixture of his own voice and researched knowledge in his writing. He uses phrases such as the following: "As we have discussed ..." and "We have seen that ..." to create coherence in the text, and "As far as I am concerned ..." in order to provide his argument. Here the 'we' shifts between an exclusive 'we' (referring to the engineers) and a 'generalized' / distanced 'we' which is used in the way that 'one' might be.

When describing the context of the village, no students specified the source of the information. Here students may have been relying on the general knowledge of rural villages, either their own or that of fellow students. Angelil-Carter asks the question: "Whose general knowledge counts? Who is assumed to have the authority?" (2000:172) Drawing a distinction between common knowledge (or "knowledge in my own head", according to one student) and knowledge attributable to first sources could lead to highly agentive writing, high levels

of affect and lexicogrammatical orientation towards the everyday. Battling to reconcile general knowledge with information from sources, the global to the local, sometimes results in technical information not being related to the specific context of the research. For instance, Mbongiseni of Nobody Village begins his 'Discussion and Analysis' section with a long unreferenced quote on the world's scarcity of water. He does not relate this to the specific context of the village, nor is the issue of water scarcity addressed in his report. The quote is thus not an integrated part of the text.

When Mthoko describes the natural environment of Nobody Village, his processes of deduction are based on research done on the internet, and this research is foregrounded. Instead of intuitively saying what the average temperature and rainfall in Nobody Village is, as someone who lives there, he deduces these details from a website which provides such facts about Pietersburg, the nearest big town. He concludes that since Nobody Village and Pietersburg are in close proximity and are at the same altitude, their climactic patterns should be pretty similar.

It is found that Pietersburg lies on 1312m altitude and has a pleasant climate with temperature averaging 27 degrees Celsius in summer and 20 degrees Celsius in winter (CLIMATE AND SPORT AMENITIES web page) from page 2 of 4 in the first paragraph. Therefore, it can be claimed that Nobody has the same climate and weather since they are close to each other. (Mthoko)

The 'acknowledgement' section in Mthoko's report emphasizes the role played by the community in providing information.

Nobody and Company consultants would like to thank Nobody Village community for making it possible to have enough information about their village in the Climate and Amenities web page. (Mthoko)

This acknowledgement also shows a certain lack of awareness about who owns information, who produces and distributes it. It is not 'the Community' as a monolithic entity that produced the website, but perhaps a faction within it. The acknowledgement is placed before the bibliography, perhaps prioritizing the community as knowledge source above other sources, like books and websites. Both Nandi and Phillip of Ingogo also acknowledge the community for providing information. According to Nandi: "The given information was provided by the neighbouring farmer and the people of Ingogo Village and thanks to them the existing infrastructure was easily obtained." According to Phillip: "The village on Ingogo was of great help in providing relevant information during the investigation of this report". This acknowledgement of the community as source of information is not standard in

academic referencing conventions, and yet it would seem that the students are correct in wishing to reference this knowledge source, along with the internet sources. This indicates the degree to which academic discourse has to 'catch up' with changing academic needs.

There were many instances of under-documentation in the reports – incomplete or absent references to sources. However, there were also many instances of 'over-documentation' indicating students' anxiety about acknowledging sources of information, and difficulties in selecting what types of information are attributable. Over-documentation is the referencing of sources which according to academic convention do not require documentation. For instance, Nandi references the illustrations from a book.

A place called home Enviromentl issues and low-cost housing
Merle Sowman and Penny Urquart
Illustrations by henry and Piet Theron
(Nandi)

There were interesting instances of over-documentation that reflected on the web environment, and highlighted the fact that, as Levernz (1998) suggests, online sources may challenge conventional academic disciplinary values. Andrew puts in the date that the website was last upgraded, but also includes the time:

Wed, 13 Dec 2000 Time: 09:31:05 +0500 (PKT)

Andrew also references e-mail addresses in his report, gained off the websites he has been using. This points to a confusion between web address and e-mail address, determining where the exact source of information lies. One student included the names of four people and their street addresses as a part of her bibliography. She had pursued certain contacts and wished to indicate this extra research in her report. Referencing addresses of websites is the norm, and if referencing of personal communications is becoming increasingly prevalent, it is not surprising that she felt the need to reference the physical addresses of people with whom she had been in personal contact. Perhaps this confusion of site and address also partially explains some students citing of the reference number of a book, and referencing 'UCT Library'.

Another common example of this over-documentation was the listing of Google to show that they used this search engine to find information. Google is perhaps seen as part of the academic context, more a part of the course than a part of the web landscape, and therefore worthy of referencing. Mbongiseni also references the keyword used in his Google search:

“windmills as solutions to rural water problems”. These incidences of ‘over-referencing’ point to a blurring of genres, the conventions of referencing and how this is complicated by the use of new technologies. (The use and referencing of web sources on this course is examined in some detail in Archer, Walton and Wilson 2000; Walton and Archer 2003).

6.9 Final comments

In this chapter I have described the regulation of the report genre both on the course and in the discipline of engineering. I have examined the representational choices students made in producing their reports and the extent to which these choices match that which is valued in academic discourse and the regulated report genre. A consistent style of writing deploys consistent degrees of agency and authorial distance, and consistent use of lexis from a specific domain rather than mixed domains. The unfamiliarity with the report genre and the difficulties around imitation of academic discourse, the distinction between general and attributable knowledge and the lack of deep understanding of the construction of academic knowledge led to the emergence of some mixed generic forms. These mixed generic forms were also sometimes a result of a shift in media – the move from screen to paper.

The reports combine the everyday and the technological. The everyday draws on ‘commonsense’ knowledge whereas the technological is more abstract in orientation, drawing on the systemized knowledge of the engineering discipline. These orientations are realized through lexical choices, grammatical constructions, degrees of authorial distance, agency and affect plus ways of organizing knowledge. The shifts between the everyday and the technological are also realized through authorial voice and the use of sources in the students’ texts. Experiential knowledge (such as descriptions of the village) tends to be represented in the lexicogrammatical constructions of the everyday. This includes lexis drawn from the domain of the everyday, the active voice, limited use of nominals and often authorial proximity. The genre of realization for experiential knowledge tends to be description which describes the ‘how’ and the ‘what’. Researched knowledge is represented in a more technological coding orientation, through the use of tables, nominal and passive constructions, low degrees of affect and evaluation in the writing and distanced authorial voice. The organization of researched knowledge is through scientific argument, procedural structures and classification hierarchies.

The regulated structure of the report genre in engineering does not enable certain discourses to surface. Although the everyday does feature in the students' reports, this is framed within scientific discourse. Discourses such as nostalgia, utopianism and propriety do not manifest strongly at all (as compared to the manifestations in the more visual genres – the Symbolic Object posters and the rural village posters). This may be an effect of mode (the written mode constrains wider expression) or genre (the report genre is too tightly structured to enable overt dialogism) or academic literacy practices (this highly valued genre in the engineering discipline is policed or regulated more strongly than the poster genre).

An interesting issue, but not something that I investigate in any depth in this research, is that raised by single-authored and multiple-authored texts. Perhaps heteroglossia looks different in single-authored texts than in those with multiple authors. Group work could produce a smoother written text, but could surface in a conflictual relation between the visual and the verbal on the posters, for example.

The reports show that students are able to structure academic argument in varying ways. One of the key ways of arguing in engineering is reflected in most of the reports, namely the specifying of criteria for development and evaluating technologies against these specifications. In organizing knowledge in this way, processes of classifying need to occur. The importance of classifying information in order to make effective comparisons is key as comparisons need to happen across 'like' categories. However, the students battle with classifications, comparisons and analytical hierarchies in their written reports. Often 'unlike' things were compared and point form was used in place of argument, resulting in flattened hierarchies and decontextualization of concepts.

The problematic classification structures can be contrasted to the strength of the students' procedural and descriptive writing. Analytical writing is what is required and valued in scientific writing, although procedural and descriptive writing have their place. The fact that students employ procedural and descriptive writing could have something to do with the strong material base of the represented subject matter. The strengths of these types of writing should be drawn on, whilst the advantages of the analytical should also be highlighted. Perhaps some modal specialization can be drawn on here, where (as argued in chapter five, section 5.9) sequence and description are an affordance of the written mode and the students have demonstrated analytical abilities in the visual mode.

Chapter Seven: Representational Resources utilized in the Rural Village Posters

7.1 Introduction

At the end of the Communication Course, each team of students is required to produce a poster which summarizes and presents their research on the village. Visual design and composition are emphasized, and students need to think about what kinds of visual, verbal and compositional choices are more appropriate for an academic audience in engineering. Posters are a common means of presenting research findings in both the engineering academic community and in the workplace. The purpose of an academic poster is to convey information, report, argue or propose an idea in a succinct and compact way.

I concentrate on three rural village posters produced at the end of the course. These are the Nobody Village poster, the Efolweni Village poster and the Ingogo Village poster (see appendix six for copies of these posters). I analyze the students' posters in terms of coding orientation, discourses and ways of organizing knowledge. It is evident that the posters combine different coding orientations and I look at the discourses and ways of organizing knowledge which realize these different orientations. In examining the students' textual productions, it is impossible to see them as 'original' works. They are inextricably bound up in their relationships with other texts, in the post-modern sense of intertextuality. Visual production is often a matter of raiding existing materials, and manipulating and recombining them in new ways; for example, the use of image banks from which ready-made images can be drawn for the construction of visual texts.

7.2 The poster genre

I conducted a survey (in 2000) on students' experiences of the reception and production of the poster genre. In the survey, the students had to comment on the type of posters to be found in their communities in terms of perceived audience and purpose. The students identified the purposes of posters to be advertising products, conveying health messages (mostly about HIV/AIDS), conveying social messages (for example, working together as a community) and campaigning politically. The common purpose is to convince or persuade: to sell a product, a set of values, an idea, or a religion. In the survey, posters were not seen to be a means of reporting, disseminating facts, or proposing new ideas to the community. The

students identified their own poster productions prior to coming to university as having similar aims, namely advertising and religious messages, although some identified posters they had made at school which required information transfer rather than persuasion. However, prior experience in poster production amongst these groups of students was very limited – only 41 of the 80 students who responded to the survey claimed to have made a poster before coming to university. These productions were often done many years previously (sometimes even in junior school).

The survey highlighted both representational choices and economic issues in prior poster production. The students reported that most of the posters had words on them (95,1%) and the majority used colour (73,2%) as opposed to black and white. Pencils tended to be preferred over pens and pencil crayons over marker pens, which is unusual considering the need for visual impact. If we consider that colour acts as the “carrier of discourses about forms of living, about dispositions of human lives” (Kress and Van Leeuwen 2001: 25), the propensity of so many students to use pencil in their poster productions becomes an interesting point for speculation. Perhaps choice of technology has something to do with identity, assertiveness, and a belief in the fact that you have something worth saying. In this case, a pencil mark could be seen as a faint and non-permanent trace that can be easily erased and changed.

Another representational choice reported by the students was the marked preference for realistic representation (realistic hand-drawn pictures) over abstract representation (maps, graphs, line diagrams). The choice of hand-drawn pictures over photographs could reflect an economic issue. Limited use of materials such as paint and stencils could be attributed to their expense. Limited resources and the cost of producing the rural village posters were issues highlighted in the interviews of 2000. The students were asked what they would do differently if they could revisit their rural village posters and two responses were: “I didn’t get a blue koki to paint in the river” and “The map was supposed to be in colour, but the colour printer wasn’t working.” One student remarked that he did not have a pair of scissors to cut the paper neatly. However, this problem was often exacerbated by problems of team work and time management: “It was not planned in detail ... a last minute rush.”

The poster genre on the Communication Course conforms to a standard form in engineering with very specific and regulated conventions. This includes generic aspects, such as a title,

introduction and conclusion, bibliography and the names of the producers, which are explicitly taught. For instance, the students are advised that the 300 word introduction should give a brief description of the proposed development, the reasons for development, the demographics, existing infrastructure and natural environment of the village. Each portfolio should be represented on the poster, and the 200 word conclusion should summarize the team's set of proposals for the village in relation to the specified criteria and contextual constraints. I was mindful of the fact that although genre knowledge is vital knowledge for the students, it is based on socially produced conventions (as discussed in chapter two, section 2.5.4), and I tried to highlight this in my teaching. In order to destabilize the idea that genres are ideal and fixed forms, aspects of the visual design of the poster are discussed in an open and not prescriptive way. These aspects include the 'reading path', links between sections, relation between words and images, types of chosen images for a particular purpose and the use of modes (such as typography and colour). Many of the students produced posters for the Symbolic Object projects and we draw on this experience in our discussions. The idea is to provide access to the genre whilst valuing the diversity of the representational resources of the students.

7.3 Description of the posters

7.3.1 Nobody Village poster

The Nobody Village poster is an ordered scientific text. The introduction to the poster provides important demographic detail on the area, such as types of employment and income. A clear listing of the problems of the area is provided, as are the criteria for development. The conclusion summarizes the proposed suggestions clearly, but omits the potential limitations and problems associated with these proposals. The concept of sustainability is emphasized in the Nobody Village poster, and comprises part of the title: "Sustainable Development in Nobody Village". Along with the notion of sustainability, there is a sense of pragmatism, for instance, the recommended switch between hydroelectricity and electricity off the national grid, depending on the water flow of the river. The elements of the composition of the Nobody Village poster are linear, placed at ninety degree angles to each other. There is a clear left to right reading path. The village is divided into infrastructural problems and each of these is looked at separately. The strong borders reinforce this separateness. The written text is strongly framed by consistent use of borders to demarcate the different sections, and by consistent font usage for the headings. Font is used here to create thematic coherence between sections.



Figure 8: Nobody Village poster

7.3.2 Efolweni Village poster

The Efolweni Village poster is organized along a set of binaries, a 'before' and 'after' scenario. The 'before' scenario is a statement of the problems experienced in the village. This is done through the visual mode (a drawing of two neglected children in an impoverished environment) and the written mode (the statement written in a large font which encircles the bottom of the picture: "We all need healthy environment! But how to maintain it?") The 'after' scenario shows suggested proposals to address the problems, followed by the 'outcomes', the proposed future for the inhabitants of the village.

The children present a dire situation. They are both standing and looking out of the picture frame towards the viewer. The older boy is helplessly sucking his thumb and the younger boy is pointing at the dried-up tap, presenting the situation to the viewer. The children are engaged in functional and survival activities. In the second picture, the children are presented in relation to each other; they are preoccupied with their own activities (drinking water and playing), and are oblivious to the presence of the viewer. The dry earth is transformed from an area of hardship to a designated play area - a sand-pit.



Figure 9: Efolweni Village poster

7.3.3 Ingogo Village poster

The Ingogo Village poster consists of a set of colour-coordinated 'boxes', each describing one aspect of development: water supply, community planting schemes, hydro power, housing and soil erosion. The images (photographs and diagrams) illustrate aspects of the written text. There is no clearly designated reading path in this non-linear text. Although the poster is tightly framed with strong vertical and horizontal lines, there is no 'centre' to the representation. The written introduction on the Ingogo Village poster spells out the existing conditions in the village in terms of climate, family income, education, water supply, power supply and housing. The conclusion summarizes the proposals for development and mentions the constraints on these interventions.

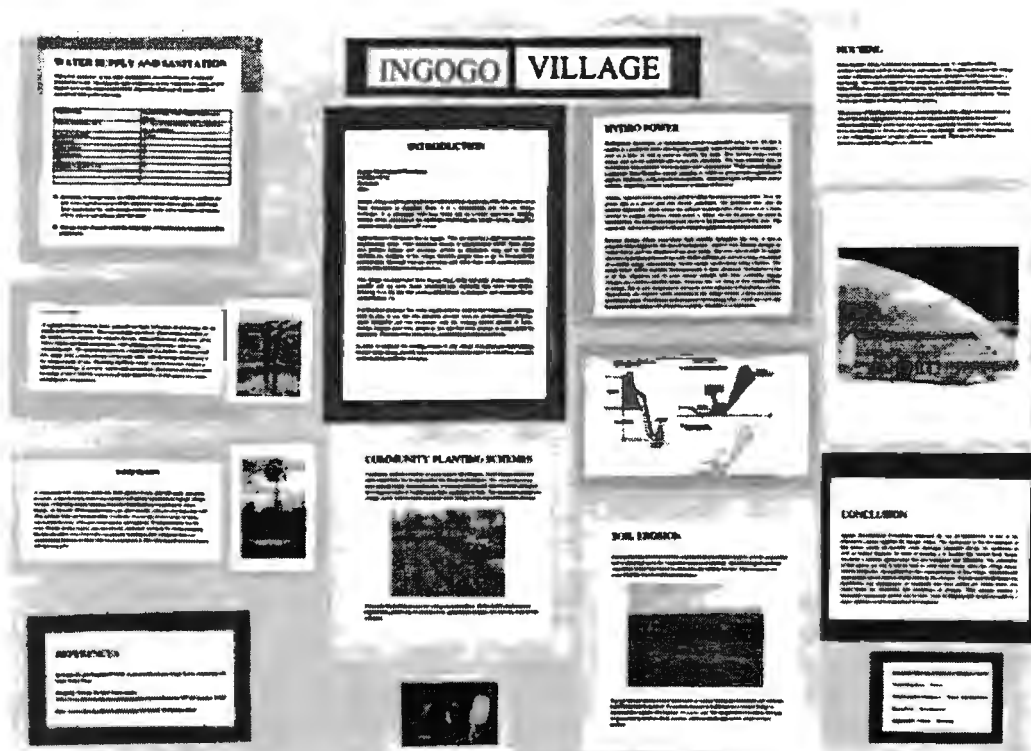


Figure 10: Ingoingo Village poster

7.4 Coding orientation

As discussed in chapter four (section 4.5.2.1), Bernstein's (1981) notion of coding orientation is used by Kress and Van Leeuwen (1996) to distinguish a number of different orientations to 'reality' in semiosis. The posters combine different coding orientations. There are two orientations operating in the Nobody Village poster: a technological orientation and a more dominant naturalistic orientation. Within the naturalistic coding orientation, the representations of aspects of the infrastructure of the village have high modality. In the choice of images, namely photographs, colour and other features correspond closely to everyday perceptions of the world.

The Efolweni Village poster also combines different coding orientations. It operates within a social realist, an abstract and a technological coding orientation, and no one orientation is given dominance. Social realism is realized in the poster through the metonymic use of the children to represent the village as a whole. The social and economic realities of the village are highlighted through the detail in the representation – the dirt, the flies, the empty tap, the poorly clad children. The abstract coding orientation of the Efolweni Village poster is realized through the use of abstract drawings, such as the cartoon-like drawings which serve to represent development through the depiction of a particular scenario with specific

characters. The technological orientation is realized through the diagram which forms the 'centrepiece' of the poster. This diagram represents the 'infrastructural inner workings' of this village, achieved by cutting away a section of the earth to show what is beneath the ground. (See figure 11.) The diagram is carefully labeled (A to H) with a key to explain the different elements. There is also some indication of measurement (in a mixture of meters and feet) on the diagram (the toilet is 2m by 2m, the underground pit is 7.5 feet). The position of the river is switched from the right of the house (in the top picture) to the left. This switch reduces modality in a naturalistic coding orientation, but not within an abstract coding orientation, where it is important to organize the represented participants in a way conducive to demonstrating certain abstract principles. The water tank has X2 written on its left to indicate that there will be two such tanks. This is an unusual way of depicting double in a diagram of this nature, and because of its idiosyncrasy in terms of representational conventions, it has low modality in an abstract coding orientation.

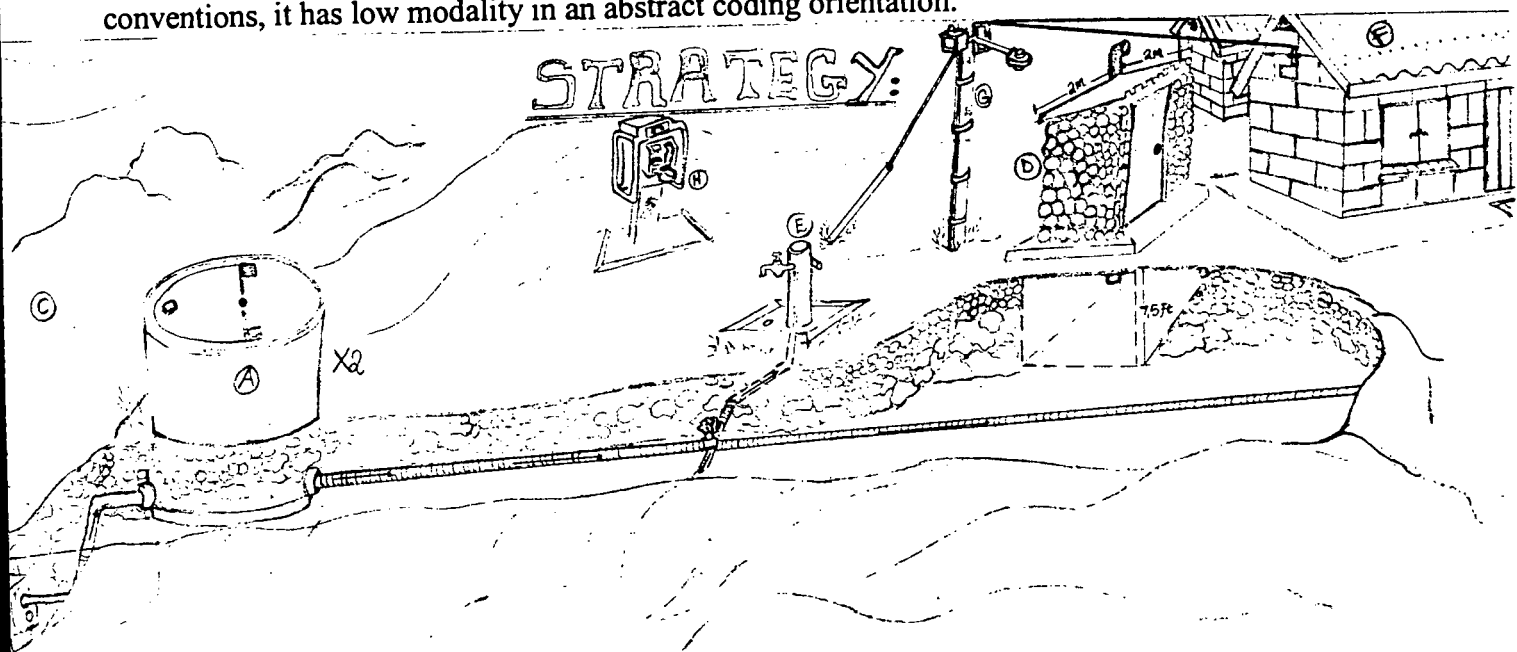


Figure 11: Diagram depicting proposed development (Efolweni Village poster)

There are two orientations operating in the Ingogo Village poster, the technological and the naturalistic (which is dominant). Forms of language usage associated with the scientific domain are largely absent on the poster, such as the use of the passive, nominalizations and specialist terms. The poster presents the conditions of the village and suggestions for development in everyday language. The images, on the other hand, have low modality in the naturalistic coding orientation as they represent rather indeterminate content as well as context. No overt reference is made in the written text to the pictures, and sometimes the connection between the written mode and the visual mode is tenuous. However, the

photographs of the windmill and the hand pump do provide more specificity about the type of technology envisaged and are linked more closely to the written text. The technological coding orientation is realized predominantly through the visual mode, through the representation of 'system' in the hydro-power system and the tabular representation of information.

In summary, the posters combine different coding orientations. The Nobody Village and the Ingogo Village posters both combine the naturalistic and the technological coding orientation, although the naturalistic appears to be dominant in both. The Efolweni Village poster is orientated towards social realism, the abstract and the technological. These orientations are given equal representational weight. This co-existence of different domains of practice and their attendant coding orientations has interesting implications for the genre of the scientific academic poster. In scientific texts closure and representational coherence are the norm. Perhaps the predominantly visual nature of the poster genre enables a more comfortable mix of domains than the written report, where slippage between the everyday and the technological was often jarring and manifested in lexico-grammatical awkwardness.

7.5 Discourse

7.5.1 Scientific discourse

All three of the rural village posters are couched in scientific discourse which has different modal realizations. This discourse is realized in the written mode through lexical choice and particular grammatical constructions such as nominalization. Scientific discourse is realized in the visual mode through diagrammatic representation, naming and labelling the represented components, and the organization of information into analytical hierarchies. In both written and visual modes, scientific discourse is realized through degrees of authorial distance from the subject matter and degrees of engagement.

7.5.1.1 Different levels of formality in scientific discourse

Scientific discourse in the written mode on the posters is actualized through a range of sometimes inconsistent lexical fields. The language on the Nobody Village poster utilizes lexis drawn from both the everyday and the academic domain.

Although wind mills are associated with noise and are wind dependent in which the latter we don't have problem with because Nobody Village is generally a windy place.

Here an argument is established by beginning with 'although'. Academic discourse markers like 'latter' and 'are associated with' are combined with everyday constructions such as 'have a problem with' and contractions like 'don't'. 'Loamy' and 'kinetic energy' were the only technical words and 'erosion' was one of the few process words. The only use of local language is the naming of a crime prevention group, 'Mapokgo a Mathamakgo'.

In the Efolweni Village poster, the students speak of 'cost effectiveness' and 'minimising cash': "The materials of low cost effectiveness but high sustainability has been chosen. This will also minimise the cash that will be spent on the overall development project". The terms 'cost effectiveness' and 'minimize' are drawn from the domain of academic discourse. The term 'cash', on the other hand, is from the domain of the everyday. The students use words like 'gonna', abbreviations like 'dept' and terms like 'water-sucking generator'. These lexical choices reduce the formality of the representation, as does the personal pronoun 'us' and exclamation mark in "let's see the outcomes!"

Scientific discourse actualized through the visual mode on the Efolweni Village poster also draws on a range of levels of formality of representation. The cartoon-like 'before' and 'after' pictures are juxtaposed with a technological diagram drawing on the conventions of scientific academic discourse. The 'informal' is realized through cartoon pictorial conventions and 'colloquial' forms of typography such as the use of a graffiti-like font. Graffiti as an art form has provenance in street culture and subcultural 'hip-hop' groupings (Klopper 2000).

The different levels of formality of representation are realized through lexical choice and syntactical structure in the written mode and through the type of image in the visual mode. Perhaps, as mentioned in the previous section (7.4), the visual mode enables an easier mix of different levels of formality than the written mode, for this particular group of students.

7.5.1.2 Degrees of authorial distance

Within particular discourses and coding orientations, there are varying degrees of authorial distance from the subject matter. In the Ingogo Village poster, the authorial voice is distanced and neutral and there is no use of the first or second person. Subjects of sentences are mostly different kinds of technology, rather than the villagers, and the group of engineering students are not mentioned as agents on the poster. In the Nobody Village poster, the authorial voice is also authoritative, distanced and neutral. In describing the village, the simple present tense is

used to indicate a habitual state of being: "The village experiences adequate rainfall during rainy seasons". When describing proposed developments, the conditional is used: "The sustainable development would include". Tentative modality is used throughout, except when talking about the environment and health, where the stronger modals 'should' and 'must' are used: "All of this *should* be done at a relatively low price and the development *must* be environmentally friendly and *must* not expose the residents to health risks" (emphasis added).

Agency is removed in the written text of the Nobody Village poster and authorial distance created through the use of the agentless passive form: "the suggested and studied sources were ..." and "After the sources were carefully scrutinised, hydropower was found to be appropriate". At times, this attempt to remove agency presents grammatical difficulties. "When coming to electricity, six sources were studied and hydropower was the one considered to be the suitable source". Although the passive form here is grammatically accurate, constructions like "when coming to electricity" indicate a clumsier attempt to remove agency. The first and second person are not used on the poster, except in the captions which are markedly different in lexis to the rest of the written text. "Dust leave me alone" is a very personal expression of what it is like to walk on the gravel roads of that area. The use of the generalized 'you' in "Queue till you dry out" establishes a sense of collective experience of hardship. The captions have a different status to the blocks of written text. They are based on a strong connection with the visual mode which, in this case, frees them up from distanced and neutral academic discourse.

The distanced authorial presence in the written mode in the Nobody Village poster is reinforced in the visual mode. In the visual representation of the village, many of the photographs (taken by the student, Mthoko, who is from the village) encapsulate an engineering town-planner's view. (For instance, the view of the road to be developed and the electricity power station.) The villagers are almost invisible, and are seldom represented as agents.

The authorial voice in the Efolweni Village poster is closer than that of the Nobody Village poster. The Efolweni Village poster makes extensive use of the first person. The use of an inclusive 'we' and 'all' in "we all need healthy environment" draws the viewer into the situation. A less inclusive 'we' is also used on the poster to include the group of students working on the project: "The material that *we* are more concerned about is the one that is

remarkably minimizing the costs.” However, this personalized voice, indicating agency and active decision-making is also interspersed with a more distanced, objective voice, as in the following statement: “This choice of material is assured to fulfill all the needs and to maintain a healthy environment”.

7.5.1.3 Engagement

Engagement is realized predominantly through the visual mode in the rural village posters. This engagement is realized through the viewer’s orientation to a represented object, the way the viewer is ‘drawn in’ by the composition. In the before and after diagrams of the Efolweni Village poster, the represented participants engage the audience through direct address. (See figure 12.) The decision to depict the situation through children is reminiscent of global media representations of development, a style often linked to requests for ‘aid’ (especially the direct address to the viewer). The children have ‘psychological salience’ (Kress and Van Leeuwen 1996: 61) as the viewer is invited to identify and empathize with them. This invitation is also contained in the inclusive ‘we’ of ‘we all want healthy environment’. The human face is particularly salient in getting viewers to identify. According to McCloud (1994), the more minimalist and generic the representation of the face, the easier we are able to ‘find ourselves’ in that representation. Hence, the pencil drawn cartoon-like quality of the figures could encourage more identification than a photograph of two children would, and this form of representation has high modality in a social realist orientation.

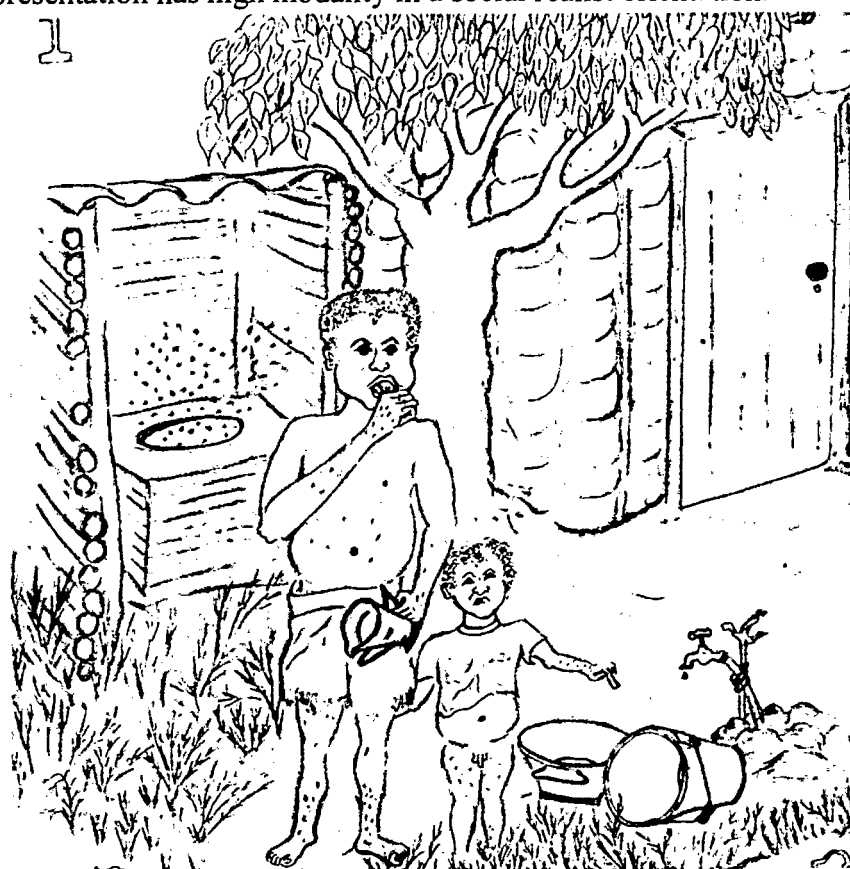


Figure 12: Direct address of the children (Efolweni Village poster)

In the Ingogo Village poster, the photograph to illustrate the community planting scheme is also of a child, a boy holding up his home-grown produce. His gaze is that of direct address to the audience and he provides a 'human face' to the developments proposed for the village. The viewer is drawn into the Ingogo Village poster through the use of colour. Red is used for the title and the introduction, and tends to draw the attention of the viewer first.

In the Nobody Village poster, the viewer is drawn in through the use of photographs and the types of images, as well as through the size and font of the title. In this poster, engagement is also realized in the written mode, although to a lesser extent than the visual, through the use of bold for emphasis, and through the captions to the photographs which focus the viewer's attention on the visual and include humour.

In analyzing the scientific discourse of the posters, I have examined the ways in which scientific discourse is actualized through different lexical fields and different levels of formality of representation; through degrees of agency and degrees of engagement in the poster presentations. Now, I will look at the manifestations and complex interplay of nostalgia and utopianism on the posters.

7.5.2 Nostalgia, utopianism and pragmatism

Nostalgia evokes an impossibly positive past and utopianism evokes an impossibly positive future. Both point to a sense of lack in the present. "Hostile to history and its invisible origins, and yet longing for an impossibly pure context of lived experience at a place of origin, nostalgia wears a distinctly utopian face, a face that turns toward a future-past, a past which has only ideological reality" (Stewart 1993: 23). There is an interesting and complex interplay of nostalgia and utopianism within and across the posters. The Nobody Village poster is an example. Although the written text on the Nobody Village poster emphasizes development, change and what 'could be', the visuals represent nostalgic timelessness; what 'is' and what has been for a long time. These are literal and descriptive pictures representing an existing situation. Nostalgia in the Nobody Village poster is particularly expressed through the juxtaposition of the photographs and the captions. The caption beneath the wide-angle photograph of the village reads: "Peaceful winter. The spatial distribution of the houses in the village". The term 'peaceful' indicates the discursive provenance of nostalgia. In this caption there is a clash of orientations, where the orientation of the engineer town-planner coexists

somewhat uncomfortably with that of nostalgia.

The choice of photographs is an important representational choice which contributes to the semiotic realization of nostalgia. The medium of photography is not used to explore what 'could be', or any of the suggestions for development of the village. Diagrams describing processes and possibilities for development are also not included. A photograph of litter and a photograph representing the underground water potential are allotted prime space on the poster (on the top left). The photograph of litter describes what 'is', whereas the 'Beat the thirst' picture describes what 'could be', namely the underground water potential. This is the only photograph on the poster that overtly points towards potential (the ideal), rather than representing the existing situation (the real). In an abstract way, however, the photographs of Nobody Village do point to a sense of the ideal and a forward-looking vision through their featuring of the horizon in a key way. The water tanks are lined up with the horizon; the dust road tapers off into the horizon; the shops are placed on the horizon; and the wide angle photograph of the village as a whole is divided in half (horizontally) with blue sky occupying almost half of the image. These open horizons create a feeling of expansiveness and space, a sense of possibility.

It would seem that nostalgia and utopianism are two very inter-related aspects of a society in transition, and these aspects thus emerge in ambivalent and dialogic ways in the students' representations. For instance, the Efolweni Village poster with the underlying view of development it espouses, is necessarily about 'change' which would seem to be antithetical to the conserving nature of nostalgia. Since change is equated to 'Westernization' on this poster, there is a strong emphasis on the move from traditional building forms (such as mud for houses) to more 'Western' forms of building materials, such as bricks. However, the idealizing thrust of nostalgia is preserved in the utopian terms in which 'development' in Efolweni Village is envisaged. It is represented as 'nurturing' (the presence of the mother-figure), ordered, harmonious, clean and relaxed. The utopianism is reflected in the mode of colour for the poster card, where there is a shift from yellow connoting dry parched earth and barrenness to blue indicating 'blue skies', horizons, possibilities and the future. A hope for things to work out seamlessly is reflected in the following statements: "According to the budgets made, everything seems to be falling into place" and "...the other part [of the poster] is for the villagers to see what the future holds for them. It shows a happy and healthy life."

The Ingogo Village poster is underpinned by a strong sense of pragmatism. It takes into consideration some of the realities of the area, such as crime. The poster states that the community gardens need to be “close enough to the village in order to be protected from vandalism and theft”. The Ingogo Village poster is acutely aware of the constraints of the proposals put forward. These constraints are mentioned in the conclusions, but are raised without being refuted, thus weakening the argument of the poster. An example:

Ingogo Development Consultants proposed the use of hydro-power as one of the alternative energy supplies for Ingogo Village. The limitations to the development of this power source are possible water shortages especially during dry conditions as well as limited finances. (Conclusion on the Ingogo Village poster)

Raising the constraints to a proposal without suggesting ways around them could perhaps point to a kind of defeatism.

Although the representation in the written mode on the Ingogo Village poster seems to be grimly pragmatic if not defeatist in orientation, a sense of utopianism and possibility is realized in the visual mode. The pictures show what ‘could be’, the possibilities in the village, rather than the existing situation (as they do in the Nobody Village poster). Even the table depicts the nominal quantities of daily water supply that should be available for human and animal consumption and agriculture rather than their current supply. The photographs of the windmill and indeterminate open land (illustrating the ‘soil erosion’ section), depict wide, open horizons. The community planting scheme photograph shows a small ploughed field which is ordered and productive. The fruits of production are illustrated in the photograph below the ploughed field, where a smiling child holds up home grown produce. The picture to illustrate ‘housing’ is the most decontextualized of all the pictures, and represents ‘house’ as a type, as well as the abstract notion of an architect’s plan of a house. The sweeping arc of light over the house is contrasted sharply with the darkness beyond, and is reminiscent of a rainbow or a halo. The diagram representing hydro-power shows how power is generated in times of low and peak demand. This is an ordered, schematic diagram with the reassurances of operational systems in place. In general, the visuals represent systems of order and stability and hope, which is somewhat different to the bleak view represented through the written mode.

7.5.3 Discourse of propriety

The discourse of propriety features only in the Efolweni Village poster. It surfaces in a minimal way in the Ingogo Village poster, and not at all in the Nobody Village poster. Propriety in the Efolweni poster is realized in the representations of the children's bodies, and emphasizes the importance of being clothed and the sense of 'dirt'. In the 'before' scenario, both children are partly unclothed. The older boy is wearing only shorts and the younger boy is wearing a T-shirt and no pants. Neither is wearing shoes. Their nakedness embodies the notion of propriety where shame is linked to dirt. In the 'after' scenario, the children represent the embodiment of 'development'. They are both fully clothed and wearing shoes. They have no blemishes on their skin and are wearing clean clothes. The shift from organic building materials (mud and wood) to manufactured materials (bricks and corrugated iron) also reflects this notion of organizing the environment by eliminating what is ideologically classified as dirt. According to Douglas, "dirt offends against order. Eliminating it is not a negative movement, but a positive effort to organize the environment" (1966: 2). She argues that by 'cleaning' we separate, place boundaries, and make visible statements about the home we create out of the material house (68). This is pertinent to the Efolweni poster where the emphasis is on 'home' in the 'after' scenario, and home represents order, cleanliness, limited contact with the environment and clearly defined boundaries with nature.

There does not seem to be a discourse of propriety operating in the Nobody Village poster. There is no ideological position regarding what is appropriate and acceptable either socially or aesthetically. The areas for improvement in the village are stated as such, without accompanying moral judgement. So, although education is identified as a key area for development, it is not couched in judgemental terms.

The standard of education is not satisfactory. Even though they have enough schools to accommodate all the children in the village, there is a shortage of equipment.

In the Ingogo Village poster, a sense of propriety is encompassed in an overt judgement passed on the village: "It is felt that this existing infrastructure is inadequate and inappropriate for normal human life". Here there is an overt assumption of the 'norm'; what is and is not appropriate according to an arbitrarily set standard. The assumption is that this norm is uniformly accepted by the producers and viewers of the poster. However, this is the only statement of this nature on the poster, and a moral sense of appropriacy is largely absent. In chapter eight (section 8.3.4), I speculate on the demise of the discourse of propriety from the unregulated to the regulated genres.

7.6 Representations of the social and the 'natural'

Overall, Nobody village is represented as a physical landscape rather than as a community of people. The photographs of the village represent the 'place' and are mostly devoid of people - there seems to be 'Nobody' in the village. This is in contrast to the photographs that other students took of their villages, some of which were strongly peopled. The only photograph representing people is the photograph of the water tanks. Four people are visible here, yet the caption guides our interpretation of the image quite differently, emphasizing the large number of people: "Queue till you dry out. Long queues at the water storage tanks".

The absence of people is reflected in the text on the poster as well, where electricity, water, sanitation and road options are investigated, but without reference to the population of the village: "There are a number of reasons for the village to be developed. The village has a shortage of resources and it is not in good condition". The inhabitants are mentioned in the Introduction, mostly as statistics and facts and hardships experienced. They are represented in terms of population size, average number per house and ratio of men to women. The criteria for development focus on the infrastructure, the environment and cost effectiveness. They are not overtly about the people in the village. The only personalized mentioning of the community is the 'Mapokgo a mathamakga' who are described as "a group of old men preventing crime by beating up people who commit crime."

Although the social is largely absent in the photographs and in the main body of writing on the Nobody Village poster, it does surface in the captions, some of which are written using lexis and grammatical constructions often associated with journalese. 'Beat the thirst' is reminiscent of the sloganeering common in commercials. A caption is a written representation which is closely linked to a visual representation and it could be this close link between the verbal and the visual that opens up a space of 'play'. The use of journalese in the captions is perhaps the only way the students could conceive of including the social, providing humour and injecting a human element to the poster. The captions encompass the three themes of the poster:

- landscape and harshness ('Beat the thirst. The land rich in underground water potential'; 'Dust leave me alone');

- infrastructural problems ('Shops or disposal sites? The random disposal of wastes due to the unavailability of disposal sites'; 'Queue till you dry out'; 'Good for tug-of-war. Exposed water pipes in the streets'; 'The electrifying one');
- home and nostalgia ('Peaceful winter. The spatial distribution of the houses in the village').

Instead of focusing on people and the social aspects, the importance of the environment is emphasized in the Nobody Village poster. The forces of nature are portrayed as active agents:

Deeper furrows could be dug to a depth that is beyond erosion's reach to bury these exposed pipes.
The land enables people to plant maize, peaches, sweet reed, watermelon and other types of vegetables.

By making 'the land' the subject and agent of this sentence, the sense is that the land determines the rhythms of life, rather than people. The importance of the environment is also indicated visually through the 'environmental' font and choice of green card for the poster. The font of the heading 'Sustainable Development in Nobody Village' resembles cracked earth, clay or parchment. This in part constitutes the environmental discourse of the poster, and also evokes the sense of dryness of the earth as evoked in the photographs. The colour green is often used as an indicator of environmental awareness signifying growth, rebirth and 'the earth'. It is an interesting signifier in the context of this poster, where the green card of the poster sets up a strong contrast with the dry, dusty 'yellowness' of the photographs of Nobody Village. The green resonates with the description of crops, growth and cycles of nature – the peaches, sweet reed and rains.

The Efolweni Village poster represents a quite different view on 'nature' and people's relationship to it than the Nobody Village poster. In the 'before' scenario on the Efolweni Village poster, there is a lot of vegetation (trees and plants) around the house and 'nature' is encroaching on 'civilization'. The children and material objects (like the water tap) are in direct contact with the earth, which has the status of 'dirt'. In the 'after' scenario, boundaries have been set and there is no vegetation in the domestic realm. Also, nature has become mediated and there is no direct contact with the earth. One boy sits on a chair and the other on a blanket and both wear shoes. The tap is mounted on a special pedestal, and the toilet is placed on a concrete block. Boundaries between private and public spaces are defined and delimited around the notion of dirt, privacy and shame. For instance, the toilet has no door in

the ‘undeveloped’ village, and is full of flies, but in the developed village it is represented as both clean and private. There is no notion of dirt in this way in the Nobody Village poster, where the dusty environment is represented as fruitful nature.

In the Efolweni Village poster, the emphasis is on people and improving people’s standard of living and quality of life, as opposed to the Nobody Village poster where people are largely absent. The Efolweni Village poster makes no mention of existing social structures and presents a patronizing view of the villagers as children in need of saving. There is more of a sense of the importance of the social, the involvement of the community, in the Ingogo poster than in Nobody Village or Efolweni Village posters. Communal planting schemes are recommended as well as the notion of a self-sustaining village: “With careful planning and support this garden can be sustained for generations to come and provide food for the villagers.” The photograph to illustrate the community planting scheme is that of a boy holding up his home-grown produce. As mentioned earlier, he provides a ‘human face’ to the developments proposed for the village. However, as in the Nobody Village poster, people are not overtly foregrounded in the Ingogo Village poster. The cultural aspects of village life are not mentioned, nor is the impact of development and change.

7.7 Perspectives on development espoused in the posters

In the Efolweni poster, the representation is made as an outsider to cultural practices; it encompasses an engineer’s view of the village as a ‘problem’ to be solved. The villagers are infantilized and represented as having little agency or interest in the processes of development. In describing the Efolweni Village poster, the students say the following:

This poster is intended for both the rural community and engineering professionals because it consist of two parts, the simple representation of the village and the complicated structures showing the construction of the underground pipe installation and other complicated items which are difficult for the uneducated villagers to understand. (Written review accompanying the poster)

There is a dual sense of audience here which constructs the engineers and the villagers as distinct. The engineers are constructed as only interested in technology (not the social) and the villagers are constructed as only interested in the social (not the technological), and as being uneducated. Within a social realist coding orientation, ‘realism’ and the ‘norm’ are constructed in terms of social organization – who can and who cannot participate in certain processes.

At times in the Efolweni Village poster there is a conflation of terms which is symptomatic of some of the confusion around the definition of 'rural' that circulated in the class (discussed in chapter three, section 3.3.1): "The whole village is full of informal settlements made of mud". 'Informal settlements' is the term used to refer to the areas outside a city where houses are made of make-shift materials and there is no infrastructure. It is uncommon to refer to a rural village with mud houses as an 'informal' settlement. 'Informal' is a euphemism for 'squatter camp' and implies new and temporary, whereas the villages are more permanent and have a longer history.

The underlying assumption about development that the Efolweni Village poster advocates is somewhat contradictory. On the one hand, the use of local resources is advocated. On the other, there is a strong emphasis in this poster on the move from traditional building materials, such as mud, to more 'Western' building materials. This differs from the Ingogo Village poster which demonstrates a strong awareness of the need to build on the existing infrastructure of the village. For example, "wind mills are already existing in this village as there are neighbouring farmers so there will be an expansion to this existing infrastructure hence will not cost a lot". Development in this poster is seen as working with what people have rather than what they lack.

7.8 Ways of organizing knowledge

I will now analyze the underlying ways of organizing knowledge in the posters. I look at the structure of argument, how linear and spatial logics operate in the posters, and conceptual frameworks and analytical hierarchies.

7.8.1 Argument: Objective weighing up of criteria

Part of argument in the engineering discipline is to judge phenomena against stated criteria (discussed in chapter two, section 2.5.3). When different technologies are described and evaluated in the students' posters, this is often done in a generalized way in which technology is viewed as independent of context. However, when the students attempt to match the technologies to the specified criteria, the specific context of South African rural areas and the particular village are considered (with varying degrees of success).

The Nobody Village poster weighs up options against specific criteria in this fashion.

The sustainable development would include *the new water supply system* that can supply the whole village with clean and fresh water, *the construction of the widely used roads* to enhance on the transport infrastructure and *the installation of electricity* that is strong, clean and safe and can withstand weather conditions. All of this should be done at a relatively low price and the development must be environmentally friendly and must not expose the residents to health risks. (Introduction on the Nobody Village poster, students' own emphasis)

Here the introduction to the poster outlines the areas of development, and then specifies the criteria: cost effectiveness, environmentally friendly and risk free. However, this way of arguing or organizing knowledge is not yet fully internalized and inhabited by the students, and occasionally in the Nobody Village poster it becomes part of the form rather than the substance. For example, in statements such as the following:

The criteria for development were developed so that the development should be done along those lines of development and any option that do not satisfy the criteria would not be considered (Introduction on the Nobody Village poster).

The selection of the suitable source was done considering the criteria for development that was made to ensure that the development is done along those lines of development and whichever source or option that do not comply with the criteria will not be considered. These criteria enabled the group to come up with the possible solutions that might help to sustain the village (Conclusion on the Nobody Village poster).

Here the emphasis on criteria as constraints fulfils the organizational function of the text rather than the meaning function. In this way, it functions as a kind of metalanguage, reflecting on the scientific organization of the text.

As in the Nobody Village poster, explicit criteria for development are stated in the Ingogo Village poster and possible options for interventions are evaluated against these. For instance: "water supply must be close to the villagers, installed taps must be easy to use" and sanitation systems must be "environmentally friendly, easily accessible and can co-operate with the existing limited amount of water". Although suggestions for development are couched in tentative modals ("Communal gardens could be of great help to the villagers" and "Trees can be planted around the village as a boundary"), the criteria for development, conversely, are couched in strong modals and come across more like commands than suggestions ("The chosen area must have enough shade; it must be close to a water resource and must be close enough to the village"). The criteria espoused are the underlying argument to the text, the belief system or ideology of appropriate development, and hence the use of stronger modals. Argument in the Ingogo Village poster is couched in language with a high degree of authorial

distance. A suggestion is made about planting strong-rooted grass such as vetiver to prevent soil erosion. The way this is argued is through the statement of facts: “As a low cost, low maintenance solution this type of grass can be used to check erosion, stabilize banks and restore areas for bare erosion”. Argument here is created through reference to the stated criteria (low cost, low maintenance) and the positive functions of this type of grass (check erosion, stabilize banks, and restore areas).

Each of the sections on the Ingogo poster is organized according to the following structure: the description of the existing situation, criteria for judging proposed interventions, proposed interventions, possible results and constraints. This could be represented in a tabular form.

Development portfolio	Existing Situation	Criteria	Proposed Interventions	Possible Results	Constraints
Power	Batteries, generators, candles, paraffin lamps, wood, cow dung.	Efficiency Safety Cost effectiveness Sustainability	Hydro-power	Improved power supply and improved health because no air pollutants as by-products	Water shortages leading to erratic power supply Financial constraints
Water supply and Sanitation	Limited water supply	Proximity Usability Environmentally friendly	Hand pumps Wind pumps Recycling of waste	Nominal daily water supply requirement met	Strong winds could hinder installation and maintenance of windmills Drought
Housing (Building materials)	Mud used for building houses (unsuitable to rainy conditions)	Strength Durability Cost effectiveness	Cement bricks	Durable houses with no damp	Difficult to build using cement bricks due to uneven landscape
Environment	Soil erosion	Prevention of further erosion Restoration of eroded areas	Vegetation to prevent top soil erosion	Stabilized banks and controlled erosion	None mentioned

Table 9: Structure of argument in the different research components on Ingogo Village poster

The written mode is well-suited to explicate both the parallel argumentative structures in each individual unit, and the representation of the units as equivalent parts of the whole (although the latter is also achieved through the visual mode, through the use of colour to frame and separate units).

7.8.2 Linear logic and spatial logic

The blocks of written language seem to be the organizing design principle for the Nobody Village poster. They are placed in sequential order, and the photographs are used to fill the spaces in between. The outcome is that the overall design of the poster is firmly led by the written. However, the linear logic of the written seems to rub up against the spatial logic of

the poster. Although a clear reading path is indicated in the Nobody Village poster through the positioning of the elements and their numbering, the meaning of the whole is not dependent on a particular sequence of reading. There seem to be two different design logics at work: the linear sequential logic of the written language (where font type, font size and consistent headings allow the eye to follow a linear path easily) and the non-linear logic of space (where different pathways are established through the text). The slippage in design logic finds expression in the haphazard numbering of the captions of the photographs. The photographs are numbered 1.1, 2.1, 3.1, 3.4, 4.1. The subdivisions of numbers could be based on an assumption that 1.1 is a more 'scientific' annotation than a simple 1. The numbers are spread around the poster in a non-sequential order and the ordering of the numbers is haphazard, with the first photo on the top left hand side of the poster labelled 3.1. There is also a complex and careful reference to the visuals in the body of the written text. The numbers are written by hand within the word-processed text and demonstrate uneasiness between the written and the visual modes. The numbers have been added in red pen, perhaps indicating the importance of the visuals they are referring to in understanding the written text. The slippage in design logic realized in the haphazard numbering is also as a result of multiple authors working on one text.

Like the Nobody Village poster, in the Ingogo Village poster information is carried in the written mode more than the visual mode. Although the written mode dominates over the visual in terms of conveying information and space allocation on the Ingogo Village poster, the logic of the design is a spatial logic rather than a linear one. The introduction and title to the poster are in red and tend to draw the audience's attention first. However, the entry point to this text is not overly important for comprehension of meaning and there is no clearly designated reading path.

There is a tension between the verbal and visual modes in the Efolweni Village poster. The information of the representation is mainly realized through the visual mode (the diagram) with its underlying narrative structure. The meaning import of the written mode is almost superfluous, and the written seems to be an 'add on'. This secondary importance of the written in conveying the meaning of the text is revealed syntactically through a sometimes incomprehensible use of written language as in the following sentence: "The implementation of water tanks instead of highly cost effective water dams". The content of the written text is at times incomprehensible and also not very specific:

The choice of material is assured to fulfil all the needs and to maintain a healthy environment, which is the most important part since that place has been suspected to be hosting 75.5% of the most dangerous diseases, as a result of pollution.

The 'needs' to be 'fulfilled' are not clearly specified, nor are the mysterious diseases (although a very specific percentage is given to them). The Efolweni Village poster is linear in form, with meaning realized in the visual mode. The fact that the information in the written mode is weak and sometimes incomprehensible could indicate that the visual mode suits some students more than others as a means for representation.

7.8.3 Narrative structures

Narrative structures "serve to present unfolding actions and events, processes of change" (Kress and Van Leeuwen 1996: 56). The Efolweni Village poster has a narrative structure as well as a conceptual structure. The Nobody Village poster and the Ingogo Village poster are not structured according to narrative. In the Efolweni Village poster, a particular scenario is depicted with represented participants engaged in clearly defined action. Naturalistic images with their concrete and specific processes and representations of human participants are akin to narratives. The poses of the represented participants, the two children, suggest 'demand' in the first picture with intimate social distance. This social distance becomes more impersonal in the final picture. Thus, in the Efolweni Village poster, the text's rhetorical intent of persuasion is realized through the narrative structure.

The emphasis on temporal sequence recurs in the students' written reflection on the Efolweni Village poster: "It is organized in two parts which shows a sequence of the steps towards village's development". The narrative structure represents not only temporal sequencing, but also depicts change from one state to another. A 'before' and 'after' scenario of necessity sets up a binary of the 'bad' (before) and the 'good' (after) and the intermediate step as 'progress', not simply change, from the bad of 'before' to the good of 'after'. A state of unhappiness is changed into a state of happiness through interventions which develop the infrastructure of the village.

7.8.4 Conceptual frameworks: Part-whole relationship

In conceptual structures, represented participants are classified in terms of their patterns or class. In the rural village posters, there are two main conceptual frameworks in operation: part-whole relationships and analytical hierarchies.

There is a paradigmatic logic at work in the Ingogo Village poster where the relation of parts to the whole is exemplified. Although the Ingogo Village poster has an introduction, body and conclusion, in effect meaning is not dependent on sequential reading. The introduction speaks about each unit in turn, as does the conclusion. Each unit stands on its own as part of the larger concept of 'development'. Each unit is organized according to the narrative structure outlined in table 9 above. The whole is 'rural development' and the 'parts' are the different infrastructural aspects of the village (housing, water supply and sanitation, the environment, hydro power). This conceptual framework is reinforced by the use of colour and the compositional design, where colours are used for the classification of the parts. Different colours represent different aspects of the whole: pink for water supply; red for the introduction and conclusions; blue for power; yellow for housing; and light orange for the environment. The conceptual framework is also realized typographically by consistency in the headings of the parts (in terms of size, case, font) indicating equality rather than a hierarchal relationship between parts.

The Efolweni Village poster is organized in terms of two analytical hierarchies. The first hierarchy shows steps in the process of development (before, intervention, after). The village is represented schematically, divided into infrastructural aspects. The second hierarchy divides the whole into parts. The final well-functioning village ('the carrier') is divided into its infrastructural elements (attributes). Demonstrating how the parts make up the whole is done through naming and labeling.

The Nobody Village poster is composed in a similar way to the Ingogo Village poster. Instead of using colour to demarcate the different sections, the framing is achieved through different patterns placed around the written text. The pattern around the introduction, conclusions and bibliography is consistent; as is the pattern around the different portfolios ('electricity', 'water and sanitation', and 'roads').

Parts of the written language on the Nobody Village poster break information up into point form, thus isolating and flattening conceptual hierarchies. The binaries operating in the scientific discourse of the poster are clear, separated out and reified into the 'advantages' and 'disadvantages' of particular technologies (hydroelectricity and quality concrete roads). These advantages and disadvantages of technologies are listed in point form with very little evaluation. Point form is also used in the 'Water and Sanitation' section of the poster, where

a body of writing is simply broken up into sections. As discussed in chapter 6, point form used in this way tends to limit discursive writing. This is a desirable effect in a predominantly visual genre, where display is emphasized. However, the resulting flattening of conceptual hierarchies here limits the analytical potential of the representation.

7.9 Final comments

This chapter has attempted to describe the poster as a regulated genre in the discipline of engineering and has analyzed the representational choices students make in producing their own posters. The students draw on a range of resources, discourses and modalities in their productions. Some of these discourses jostle against each other in particular texts, producing complex meanings. For instance, utopianism battles with some of the harsh realities of life in rural South Africa. Perspectives on development as an inclusive democratic process confront the discourse of propriety which upholds and propagates certain societal norms and values.

One of my original observations when I first became interested in undertaking this research was that the relationship between technology and society was expressed to a far greater extent in the students' posters than in their written reports (see chapter one, section 1.1). It does seem that the visual genre enabled students to utilize discourses seldom used in engineering, such as the discourses of development, propriety, utopianism and nostalgia. Many of these discourses do not surface in any significant way in the students' written reports. Perhaps it is something about the visual mode or the combination of the visual and written modes that enables some kind of 'play' between standard Western scientific discourse and other discourses emanating from students' life worlds. Often these discourses manifest in the images (for example, utopianism in the Ingogo Village pictures) or in the interaction between the image and the written caption (for example, the Nobody Village poster). The visual mode can perhaps enable and accommodate mixed domains of practice more easily than the written mode for this particular group of students.

In the rural village posters, the students draw more overtly on scientific conventions than they do in the Symbolic Object posters (discussed in chapter eight). An understanding of the form of academic argument in the discipline of engineering is evident across the posters, namely the weighing up of phenomena against criteria and against contextual constraints. At times, this knowledge is more theoretical than applied and manifests in the form of a commentary on the organization of the text. The analysis of students' posters has shown that the systems

represented include narrative and transformational structures as well as conceptual hierarchies. As argued in chapter five (section 5.9), the opportunity for students to utilize a range of modes in their textual productions enabled different opportunities for conceptual representation. The Goat/Efolweni Village poster group demonstrated sophistication in visual representation, whereas the writing on the Efolweni Village poster conveys little conceptual information and is incomprehensible at times. The posters tend to be more conceptual than narrative in structure, which resonates well with engineering discourse where analytical structures are valued over narrative structures in the visual mode.

In chapters five, six and seven, I analyzed three sets of texts produced by the students: Symbolic Object posters, investigative reports and rural village posters. In the next chapter, I will analyze the shifts in students' representational resources across these three sets of texts.

Chapter Eight: Transformation of Students' Resources across Genres and Modes

8.1 Overview of chapter

This chapter focuses on addressing the second research question: “How do students utilise and adapt representational resources from the larger semiotic landscape in the reception and production of a range of genres within academic conventions?” It examines the transitions and persistence of students’ representational resources over time across modes and genres. To do this, I focus on the representational resources identified in the Symbolic Object posters (a largely informal and unstructured curriculum task) and the ways these resources are transformed, persist unchanged or disappear in the more regulated genres of the written reports and the team-produced rural village posters. The underlying ways of organizing knowledge in students’ texts remain fairly constant, whereas there are discursive shifts as well as modal shifts. My analysis acknowledges modal differences (the modal changes of these resources in the shifts from one genre to another); pedagogical differences (the emphasis placed on these texts in the curriculum, the time and assessment weighting); and temporal differences (the place of these texts in the curriculum across the year of the course).

The following table shows the texts and their groupings:

Symbolic Object Project (Group project; less regulated)	Written Reports (Individual project; more regulated)	Rural Village Poster (Group project; more regulated)
Flowers poster	Nobody Village reports (x3) Mbongiseni Mthoko Thabang	Nobody Village poster
Goat poster	Efolweni Village reports (x1) Andrew	Efolweni Village poster
Pants on Women poster	Ingogo Village reports(x 2) Phillip Nandi	Ingogo Village poster

Table 10: Students’ texts and their groupings

The Symbolic Object posters and the rural village posters are both group activities, whereas the written report is an individual exercise (although it is based on information identified by group, namely the existing village infrastructure and ‘needs’ of the village).

In looking at the transitions of representational resources across texts, I concentrate both on particular groups of students and on general trends. I do not track the transitions of resources

from each individual student report to each rural village poster. Rather, I use broad strokes to document a process and focus on selected key features of the process. These features include:

- shifts in coding orientation;
- shifts in scientific discourse (including agency and lexis);
- constructions of gender, interplay of nostalgia and utopianism, shifts in propriety;
- shifts in perspectives on development and in the construction of the natural;
- mixing of primary discourses and metalanguages;
- similarities and differences in the underlying ways of organizing knowledge across the texts.

See appendix four for a summary of these transitions across texts.

8.2 Coding orientation: Variable 'mixing' of domains of practice

There are shifts in coding orientation across the three textual moments on the course. In the shifts across texts there is a move from mixed domains of practice, where there is little indication of the status of knowledge in the Symbolic Object posters, to more firmly delineated domains of practice in the written reports and the rural village posters. Here discourses, ways of organizing knowledge, use of modes and media are more consistently aligned with the coding orientation of the representation. I will look at the Flowers / Nobody Village texts as an example of this.

In chapter five (section 5.5.1.3.1), I argued that the coding orientations or life worlds in the Flowers poster blur and the symbolic and the functional domains are thrown together. Sometimes this mix of domains of practice is done in a way that produces a disjuncture in the system of classification operating in the poster, but at other times, the mix is evocative and generative. In chapter 6 (section 6.4), I showed how in the written reports of the Flowers / Nobody group, the different domains of practice result in dialogic struggle which is evident in the conflict between the everyday and the scientific. These struggles are evident in the differing degrees of affect and agency, under- and over-referencing and the assumption of or over-explanation of 'general' knowledge. In contrast to the Flowers poster and the Nobody Village reports, there is much less of a mix of domains of practice in the Nobody Village poster. In this text, dialogism is realized through modal specialization and vestiges of the personal and the everyday remain in the visual mode.

A key feature of scientific practice is the theoretical work of abstraction. The Symbolic Object posters produced by the students tend to be abstract in orientation, whereas the more structured tasks are less so. The rural village posters tend to be naturalistic in orientation and the written reports tend to be oriented towards social realism. It is interesting that the less structured curriculum project enabled students to represent abstraction, whereas the more structured task produced less abstraction. Perhaps students felt 'freed up' by the less structured nature of the project as well as by the emphasis on the symbolic to move in the realm of abstraction without feeling threatened. Focusing on the unstructured curriculum task could be a way of teaching abstract representation to students, drawing on the representational resources from their primary contexts.

I have argued that there are certain shifts in coding orientation across the texts. However, and equally interesting when looking at how students utilize representational resources, there are also underlying similarities in coding orientation in the texts of particular groups. Take as an example the Goat / Efolweni group. There is an underlying similarity in the way in which the Goat poster and the Efolweni Village poster mix naturalistic and abstract coding orientations. In both posters, the narrative structure is realized through naturalistic coding orientation, whereas the analytical is realized through abstract coding orientation. In the Goat poster, the narrative process includes steps in the process of slaughtering a goat. In the Efolweni Village poster the narrative process includes stages in development of the village. These narrative processes are realized through naturalistic coding orientation where details serve to create a likeness to 'reality'. In the Goat poster, a few tufts of grass represent nature, and parts of the kraal fence represent a 'cultural space'. Details such as flies to represent dirt and smell are used to create a likeness to reality in the Efolweni Village poster. The analytical structure in both the posters (the dissection of the goat and the schematic representation of the village infrastructure) is realized through abstract coding orientation where the concrete is reduced to its essential qualities, detail is omitted, and the represented participants become generic.

To summarize, the shifts and similarities in coding orientation are similar in the texts of particular groups of students (produced in spaces with different degrees of regulation). There is a move from mixed domains of practice in the less regulated genres to representations of more firmly delineated domains in the more regulated genres. However, the exception is the Goat / Efolweni Village posters where social realist, abstract and technological coding orientations co-exist, with no one orientation given dominance. The Goat / Efolweni Village

texts demonstrate that it is possible to maintain a range of domains of practice, whilst still producing a 'scientific' text.

8.3 Discourse

In this section I discuss a number of discourses drawn on and propagated across the three sets of texts as well as the discourses which are omitted (or suppressed) in particular texts. As discussed in chapter two (section 2.4.2.1), discourses do not exist in isolation, but within larger systems of sometimes contradictory discourses. Text is the site where discourses are materially realized and where different discourses are brought into contact. There are traces of discursive struggles in the transitions across genres, but some conflicts are also smoothed over and erased.

Some of the key discourses to emerge in the students' texts include: scientific discourse, gender discourse, religious discourse, utopianism, nostalgia and a discourse of propriety. See table 11 below for the discourses identified and analyzed in students' texts.

Discourse	Features of the Discourse	Semiotic Realization of the Discourse
Western Scientific Academic Discourse	<p>Pursues depersonalized and objective truth.</p> <p>Transforms processes into systems.</p> <p>Deals in abstraction.</p>	<p>The discourse is realized through scientific lexical fields and particular grammatical constructions (e.g. nominalization, the use of the passive).</p> <p>The discourse is realized through high degrees of authorial distance and low degrees of affect (in terms of both engagement and evaluation).</p> <p>Scientific discourse is often constituted through argument.</p> <p>The discourse is realized through particular genres valued by the discipline.</p> <p>There is provenance of design elements in scientific textbook writing conventions (e.g. labelling of diagrams; use of a key).</p>
Gender Discourse	<p>Reveals perceptions of men and women and their roles in society.</p> <p>Reveals the gendered nature of social practices.</p> <p>Operates through male / female signifiers.</p> <p>Can objectify men and women as sexual objects.</p>	<p>The discourse employs 'gendered' terms.</p> <p>The discourse uses signs that have provenance in 'feminine' or 'masculine' domains (e.g. certain colours).</p>
Religious Discourse	<p>Refers to a transcendental signified.</p> <p>Conflates the physical and the spiritual.</p>	<p>The discourse is constituted through the use of lexis drawn from a religious domain (e.g. the word 'congregation').</p>

	Propagates a set of principles to live by.	<p>The discourse is realized through the use of images associated with a religious domain (e.g. icons).</p> <p>The discourse operates through ‘principles’ which often are established as binaries.</p> <p>The discourse is realized through particular genres with specific rhetorical and grammatical conventions.</p>
Propriety	<p>Signals the appropriate behaviour in a specific context; and is a measure of allegiance to convention.</p> <p>Clearly defines boundaries between humans and nature.</p> <p>Emphasizes the community and common good over the individual and individual gain.</p>	<p>Proper or improper instantiation of a discourse is an index of adherence to or conformity to practices within a discourse or genre.</p> <p>The discourse of propriety is often inscribed on the body.</p>
Nostalgia and Utopianism	<p>Nostalgia propagates an idealized and static view of an impossibly positively remembered past.</p> <p>Utopianism propagates an idealized view of an impossibly positive future.</p> <p>Nostalgia and utopianism construct history from a particular perspective (a narrativized version of the past or future)</p>	<p>These discourses are realized in the visual mode through images of what is constructed as the ‘ideal’ and in both the written and verbal modes through narrative versions of history.</p>

Table 11: Discourses identified in the students’ textual representations

The final rural village poster productions draw on similar discourses to the Symbolic Object posters, although these often take a different form with different modal configurations in the more regulated context. For instance, in the Nobody Village poster, scientific discourse is prioritized. The social, mystical and utopian orientations (that were evident in the Flowers poster) are largely suppressed in the written mode, but persist in the visual mode. In general, nostalgia in the rural village posters materialized predominantly in the visual mode and not the written (as it does in the Symbolic Object posters). This is ‘transduction’ in Kress’s sense, where “an utterance and its semiotic material is not *transformed* from its modal realization in one mode into modal realization in another, but is *recast* within the potentials of the other mode” (2003: 130).

8.3.1 Realization of scientific discourse across texts

The shift from Symbolic Object posters to rural village posters (unregulated to regulated genres) is a shift from an inclusive ‘and’ logic to an ‘either/or’ binary logic. An inclusive ‘and’ logic is a way of playing with conventions, whereas binaries tend to valorise one pole

of the opposition as the 'norm'. The binaries of Western anglophone academic discourse tend to valorise logic over emotion, academic truth (published research) over personal experience, closing down of possible meanings over open-endedness and certainty over uncertainty. The shift from Symbolic Object posters to rural village posters is in many ways a shift to this dominant academic discourse. Dominant discourses seek to impose particular meanings and are more monologic, authoritarian and closed in nature.

In the rural village texts, the students consciously begin to draw on a more scientific academic discourse to create a disjuncture between everyday commonsense knowledge and the systematized knowledge of the discipline. However, in the texts they produce, there is still varied employment of scientific discourse. Although the Efolweni Village poster is the more regulated curriculum task, scientific discourse is more variable in this poster than in the less regulated Goat poster. Scientific discourse is actualised differently through a range of lexical fields, which are drawn from sometimes inconsistent domains. The Efolweni Village poster draws on a range of levels of formality of representation: cartoon-like images and colloquial forms of typography are juxtaposed with technological diagrams which draw on the conventions of scientific academic discourse. The visual representations on the Goat poster seem more consistently scientific than those on the Efolweni Village poster. This is possibly due to the fact that there was in reality one author of the Goat poster, even though it was supposed to be a group effort.

8.3.1.1 Shifts in agency and degrees of authorial distance

In this study I have looked at agency and degrees of authorial distance as indicators of scientific discourse. Variable employment of scientific discourse results in differing degrees of authorial distance operating across the written reports and rural village posters. All the students use passive forms to foreground process, yet there is vacillation of agency which manifests in awkward grammatical constructions. The actors that tend to be foregrounded in the written reports and rural village posters are the village, the villagers, different technologies and the engineers themselves, with varying degrees of agency assigned to each one.

In general, there tends to be a shift from a more personal voice in the Symbolic Object posters to a more distanced voice in the more regulated genres. In the Pants on Women poster a highly personal voice is evident in the visual and written modes. The personal voice of the

Pants on Women poster is realized through choice of images, namely photographs of people that are known to the group. The Ingogo Village poster, on the other hand, uses generic visuals downloaded from the Internet that are not specific to time and place. These visual choices serve to depersonalize the representation and reinforce the authorial distance established in the written text. The distanced voice is also realized typographically through the choice of the Times New Roman font which appears neutral and scientific, as compared to the more personal rounded font used on the Pants on Women poster. The written language of the Ingogo Village poster is also depersonalized and objectified, and employs third person terms of address, agentless passives and nominalisations. The more personal voice generally used in the Symbolic Object posters is interesting considering that these texts tend to be more abstract in orientation (as mentioned in section 8.2). This combination results in 'mixed' forms which are able to express different meanings than more stable and regulated forms.

Across each group of students' texts, there is a shift from strong identification with the represented subject matter in the Symbolic Object posters to more ambivalent identification in the rural village texts. For example, the Goat / Efolweni group made interesting shifts in degrees of identification across the three texts of the course. There is strong identification in the Goat poster, almost no identification in the written reports, and an attempt to establish a balance between 'insider' and 'outsider' in the rural village poster. The perspective of the Goat poster is from inside the cultural practice. There is a strong emphasis on belonging, encapsulated in statements such as "In our culture ...". In Andrew's written report, the sense of agency and belonging disappears. The students as engineers are not foregrounded as a group in any way. In the Efolweni Village poster, a sense of agency is re-established, and 'we' is used to include the group of students working on the project and sometimes the viewer. There are two voices operating on this poster, a personalized voice, indicating agency and active decision-making and a more distanced, objective voice. The more ambivalent identification with the subject matter in the written reports and rural village posters could be ascribed to the students' more ambivalent roles. They possibly identify with both the professional engineers and the people from the underdeveloped rural area.

8.3.1.2 Lexical choices across texts

Across the students' texts, lexical choices are made from specific domains depending on the coding orientation of the text and the discourses that are utilized. The shift to scientific academic discourse in the more regulated genres indicates that across all the groups, there is

an awareness that certain kinds of lexical choices constitute academic writing. It is interesting that more local lexis tends to be used in the written reports than on the rural village posters. This occurs in both technological and social realist coding orientations. For instance, the local word 'donga' is used frequently in the written reports, but not on the posters. In the Nobody Village poster, the word 'cracked' is used instead of 'donga': "The roads in the village are not in good conditions since they are cracked'. The use of local lexis could be influenced by media and mode. Perhaps there is a greater awareness amongst the students of audience in the visual mode which is about display and is therefore more overtly public than the written mode. The use of local lexis would be exclusive and limit the audience to the 'local'.

It is clear that the choice of lexis is based on students' (conscious or unconscious) interest, drawing on the resources that are available. Often the students' use of language as a resource reflects identity choices. By using home languages, students say something about rural identity, 'Zuluness' and sub-cultural identity. For Le Page and Tabouret-Keller, "linguistic items are not just attributes of groups or communities, they are themselves the means by which individuals both identify themselves and identify with others" (1985: 5). People enact aspects of identity through each utterance, and this enactment occurs in a particular way depending on audience. There is thus not a particular one-on-one relation between code and function. The word 'kraal' appears on the Goat poster. Local lexis is used here to point to the cultural orientation of the text, to create affinities between 'insiders' and to create distance from 'outsiders'. Individuals create patterns of linguistic behaviour to resemble those of the groups which they wish either to be identified with, or to be distinguished from. In the Flowers poster, the word 'marijuana' has cultural provenance and aligns the group with the global Rastafarian culture. Here more local forms of the term ('dagga', for example) are not selected. In the Nobody Village poster, the group 'Mapokgo a mathamakga' is named in the language of the village. This is a personalized reference to the people of the village and their agency in difficult socio-political conditions. It is written in bold – perhaps to indicate the shift to home language. These uses of local lexis demonstrate that "linguistic behaviour is a series of acts of identity in which people reveal both their personal identity and their search for social roles" (Le Page and Tabouret-Keller 1985: 14).

I have argued that in the more regulated genres, students consciously begin to draw on more scientific academic discourse. There is a shift from a strong sense of identification with the subject matter and the attendant personal voice in the unregulated genres to a more

ambivalent identification and a distanced voice in the regulated genres. With the shift to academic discourse come certain lexical choices, namely lexis drawn from the technical domain. I have also attempted to demonstrate that although the shift is towards dominant academic discourse, lexicogrammatical choices are inextricably linked to identity, which sometimes results in more dialogic moments in students' texts.

8.3.2 Constructions of gender

Gender demarcates the cultural and social spaces one is allowed to occupy in the worlds of these representations, and is strongly linked to the discourse of propriety (discussed in section 8.3.4.) For example, in the Goat poster, 'sacred' spaces are reserved for men, and in the Efolweni Village poster, domestic spaces are reserved for women. The Goat poster emphasizes the gendered nature of the slaughtering process. Three men encircle the goat whilst they kill it, which emphasizes the togetherness of the men and the exclusion of women from this practice. In the Efolweni Village poster, the 'before' scenario is a 'motherless' scenario, characterized by lack, neglect, and chaos. In the utopian 'after' scenario, the mother is represented as nurturing, overseeing an ordered domestic scene. Although gender is a key feature of the Goat poster and the Efolweni Village poster, it appears to be absent as an indicator in the written reports. Perhaps this is because in the written mode gender roles would have to be spelt out more explicitly, whereas in the visual mode, the representation of the mother, for example, is a visual shortcut which evokes notions of nurturing and security, without having to explicitly describe these. The students' texts raise the question of what is left behind when a practice is recontextualized; what remains visible and what becomes invisible. For instance, in the representation of the practice of goat slaughtering, the key role of the 'grandmothers' is omitted. When one recontextualizes practice, the embodied contradictory aspects of the practice get left behind.

8.3.3 Interplay of discourses of nostalgia and utopianism across texts

There is a fascinating interplay of nostalgia and utopianism across the different texts on the course. Nostalgia does not disappear in the more regulated genres; it is just realized differently, through different modes and content. As discussed in chapter five (section 5.4.5) and chapter seven (section 7.5.2), nostalgia and utopianism are about yearning for a desired past or future which has been fictionalized and is perceived as absent in the present. The past that nostalgia seeks has only ever existed as narrative and hence, always absent, that past continually threatens to reproduce itself as a felt lack (Stewart 1993: 23).

As I argued in chapter seven (section 7.5.2), nostalgia and utopianism are obvious inter-related aspects of a society in transition like South Africa, and as a result, these aspects emerge in ambivalent and dialogic ways in the students' representations. There is a tension between 'development' or 'change' as a necessary good, and nostalgia for traditional timeless ways. In these texts, the notion of 'change' is constructed as complex and additive in some cases, and reductive and binary (either / or) in other cases. For instance, the Flowers poster draws on and propagates both a sense of utopianism and nostalgia. The utopianism is expressed through an emphasis on peace, patience and solidarity in statements such as "together we stand divided we fall". The nostalgia in the Flowers poster manifests in religious discourse (Rastafarianism) and the valuing of traditional cultural practices. The utopianism and nostalgia of the Flowers poster persists in the Nobody Village poster, but there is a difference in its modal realization. Here nostalgia is realized through the visual rather than the written mode (which realizes the authoritative discourse of science). The photographs evoke home for the student from the village and a way of representing that home to his classmates.

The tension between change and nostalgia for traditional ways is also evident in the Goat / Efolweni Village texts. The Goat poster represents nostalgia for traditional practices that are unchanging over time, but the Efolweni Village poster espouses 'change' and past cultural traditions are not mentioned. However, the idealizing thrust of nostalgia is preserved in the utopian terms in which development in Efolweni Village is envisaged. Here development is represented as 'nurturing' (the presence of the mother-figure), ordered, harmonious, clean and relaxed. Andrew's written report is very different to both the Goat poster and the Efolweni Village poster as it is neither utopian nor nostalgic in its orientation. The village is seen as a structural problem to be solved, where living conditions and standards of health need to be improved. Rather than utopianism, there is a strong sense of pragmatism in the suggestions that the student puts forward, and he relates these to the very specific local context. Although pragmatism is advocated, some of his ideas appear impractical, not necessarily due to a utopian vision of society, but to a view of society where people need to 'monitor' each other. For example, his idea of the community monitoring the water usage at the taps: "a certain number of houses around the place in which the taps are implemented will have to be held responsible for ensuring proper water utility".

The Pants on Women poster reveals a positive optimism about freedom, choice and change, and nostalgia for past ways does not seem to be evident. The locus for this utopianism is the individual. The Pants on Women poster emphasizes change and modernization as being unquestionably good. The Ingogo Village poster also emphasizes the importance of change, but has a strong sense of the difficulties and constraints on change. Rather than utopianism, the Ingogo Village poster is underpinned by a strong sense of pragmatism. It takes into consideration some of the realities of the area, such as crime. The optimism that there is in the Ingogo Village poster lies in the functioning of the collective: the planting of communal gardens, saving of water supplies and creation of sustainable systems for the future functioning of the community. The written reports on Ingogo Village also emphasize the grim realities of the area: the social and economic issues of crime, alcoholism and poverty in Ingogo. The lessening of utopianism into the pragmatism of the rural village texts could be a function of the Communication Course – the result of encountering new intellectual environments.

Pragmatism seems to be more prevalent in certain modes and genres, indicated by less utopianism in the written reports than is evident in the posters. Even in a poster like Ingogo Village which has a rather bleak overall vision of the constraints of development, elements of utopianism are realized through the visual mode, through some of the images used. In the Nobody Village texts, nostalgia is realized through the visual mode on the poster, but is not particularly evident in the written reports. There is a suggestion of utopianism in the written reports, although these are couched in tentative modalities: “If the electricity is supplied in Nobody Village things *may* get better and there are chances that the life as a whole *may* be better” (Thabang’s report, emphasis added). There is a thin line between the utopian and the impractical in Mbongiseni’s report. “Few workmen in the village will be elected to help us in the process and donations will be made by the villagers to pay these men.” The more impractical suggestions such as this one were omitted from the final Nobody Village poster, probably as a result of discussion and debate in the group.

In analyzing the students’ texts, it emerges that nostalgia and utopianism are key concepts to explore in a course on rural development which is necessarily about change. Identity issues and values are inextricably linked to what one feels nostalgic or hopeful about. The tension between nostalgia for the past and an imperative to change (and the semiotic realization of this tension) can be highlighted and discussed as part of the curriculum. For instance, the

concept of change can either be constructed as additive (building on existing practices) or as reductive (replacing existing practices). This kind of discussion is important in beginning to unpack the complex identity issues involved in living and working in a society like South Africa which is experiencing rapid transition.

8.3.4 Discourse of propriety in different genres

Kress and Van Leeuwen (2001) argue that moral discourses, for many in the West, are no longer systematically and explicitly shown. They have gone underground and are hinted at or evoked through provenance. However, the students in this study were doing something rather different to this. They explicitly evoked strong moralistic discourses especially in the Symbolic Object posters where they were given free range to do what they wanted, and to evoke whichever discourses they wished. In this research, I have referred to the ensemble of moralistic discourses as 'propriety'. Propriety defines a moral view on adherence to convention in a specific context. Propriety thus works to suppress heteroglossia and naturalize itself as dominant.

Propriety takes a sociocultural form, but is often realized semiotically through the representation of the body in society (Mayol 1998: 21). Propriety in the Goat poster takes a gendered form and concerns who may take part in the ritualistic act of slaughtering (men, not women and children). Propriety also takes a gendered form in the Pants on Women poster, prescribing who can and cannot wear pants. The emphasis here is on 'looking good' (aesthetics) and on morality. In the Efolweni Village poster propriety is realized in the representations of the children's bodies. Here nakedness becomes significant as does a sense of dirt. The shift from organic building materials (mud and wood) to manufactured materials (bricks and corrugated iron) also reflects this notion of organizing the environment by eliminating what is ideologically classified as dirt. A complex link between privacy, shame and development is set up across the Efolweni Village texts. Although propriety is not as dominant a feature in the written reports as in the poster, it does surface as a factor when discussing the existing toilets. He says there are no "proper toilets" there and "the ones that are existing are just enough for the users not to be seen by other people". Privacy is emphasized in the same way here as it is in the 'before' scenario on the poster where the toilet is depicted as 'unprivate' with no door.

In the more regulated genres, the discourse of propriety is less overtly moralistic. There is a shift in focus to what is deemed appropriate in development, both by the students themselves, but also by the sometimes contradictory discourses surrounding development that are prevalent in our society. Propriety functions by favouring the collective over the individual and therefore upholds societal boundaries. It functions by specifying appropriate behaviour in relation to others. Hence a sense of propriety is valued over 'attracting attention to oneself' in an individualistic way. One of the key tensions in the Pants on Women poster is this relation between the collective and the individual. In upholding the collective and not the individual, the discourse of propriety can be aligned with certain notions of development. In this view of development, the community and the common good are emphasized over the individual and individual gain. This is the idea of sustainable development with an eye on subsequent generations. In the Ingogo Village poster, for example, communal planting schemes are recommended to sustain the current villagers as well as the generations to come.

A discourse like propriety can be used in the classroom to reflect on meaning-making and cultural practices. Propriety is about being able to read a particular context and make decisions deemed appropriate to that context. In this sense, it is a crucial resource in decisions about meaning-making. However, propriety is conservative in nature; it is about 'fit', norms and social expectations. In highly valued practices, such as the regulated genres of academic practices, the emphasis on 'fit' or appropriacy to the perceived context becomes paramount. Douglas's (1966) notions of 'clean' and 'unclean' also become pertinent here, as signaling nervousness about hybridized or mixed forms. The policing of conventionalized forms of practice is analogous to the regulation of certain highly valued genres in a particular discipline, for instance, the written report in engineering.

8.4 Shifts in students' perspectives

8.4.1 Perspectives on development

Contradictions and tensions in the perspectives on development are evident in students' texts. Sometimes these texts espouse democratic inclusion. At other times, authoritarian and uni-directional discursive constructions create a distance between the engineers and the villagers, where development is construed as 'aid' or as addressing a perceived 'lack'. The discursive conflicts play out around two issues: inclusive and exclusive processes (representations of 'us' and 'them') and the conflict between students' emerging identities as engineers and their

previous identities as rural people. These conflicts result in ambivalent representations of the villagers.

The conflict between 'us' and 'them' plays out differently across texts which are produced by the same group of students. So, for instance, it is interesting that there is more of a sense of 'othering' in the Efolweni Village poster than in the Goat poster. In the Goat poster, the representation is made by an insider to cultural practices and no judgment is passed. In the Efolweni Village poster, the representation is made as an outsider to cultural practices; it encompasses a view of the village as a 'problem' to be solved. The engineers are constructed as being interested in the technological (not the social) and the villagers are constructed as being interested in the social (not the technological). They are represented as uneducated, as 'children' in need of saving. In the Efolweni Village reports, there are ambivalent representations of the villagers and their role in development. On the one hand, participatory processes are emphasized. On the other, the villagers are represented as incapable of working on their own without 'outside' support. Overall, the underlying assumptions about development that the Efolweni Village texts advocate are contradictory.

The conflict between students' emerging identities as engineers and their previous identities as people from often impoverished and under-developed areas is realized semiotically in the uncertain modalities of some of the written text. For example, the use of the modal auxiliary 'can' indicates an ambiguous relation to authority, as it has two meanings (both 'ability' and 'permission'). The use of strong modals in students' writing could indicate that students role-play themselves as qualified, both in this particular project and in academic practices (the idea of mimicry of academic discourse discussed in chapter two, section 2.5.3). However, I have shown in chapter six (section 6.5) that although a sentence may have the grammatical construction of a command, it may not necessarily have the force of a command. The use of strong modals in student writing may also be related to students' varying competence in English as an additional language.

In the Symbolic Object posters there is a strong sense of student involvement with the represented subject matter and the issues up for debate (the meaning of flowers, slaughtering a goat, wearing pants). In the written reports and rural village posters, the identification with the role of consultant engineer enables more of a distance from the issues of development, which sometimes results in complex constructions of the 'other'. In general, there is less

ambivalence and othering in the rural village posters, than in the written reports. This could be a function of mode and genre, but could also reflect subtle shifts in students' perceptions over the course. The decrease in 'othering' may be related to the lessening of the discourse of propriety (discussed in section 8.3.4).

I have argued that perspectives on development as expressed in students' texts are contradictory – at times the texts espouse participation and at other times they espouse authoritarianism, an 'us' and 'them' divide. Discussing these contradictions with students as part of the curriculum could create awareness of how ideology functions and encourage them to interrogate their own ideological positions.

8.4.2 Perspectives on nature

There is a shift from a focus on the social in the written reports to a focus on the 'natural' in the rural village posters. Perhaps this is an affordance of the report genre and written mode which enable more space than the visual mode for meandering and exploring a particular issue. The emphasis on the natural could be a result of having gained a sense of environmental awareness in the course. However, the shift away from the social could also reflect students' assumptions that engineering is about technology and not about people.

There is a shift in students' texts from a view of nature and society as being inextricably linked, to a separation where the importance of utilizing nature for society's benefit is emphasized. The discourses of science and mysticism, the spiritual and the physical are conflated in the Flowers poster, and symbolic and functional discourses given equal status. In the Nobody Village Poster, the mystical is largely suppressed and all that is left is a certain reverence for nature. In the Flowers poster, nature is portrayed as an agent providing portents and signs to humans (so, for instance, blossoms indicate conception). In the Nobody Village poster, nature is largely portrayed as passive, as serving the needs of humans. Nature is something to be 'harnessed' and developed, such as the rivers and the rain. The association of the flower with the discourse of reproduction is a strong feature of the Flowers poster (as in the discussion of the sunflower and the fertility cycles of the marijuana tree). There seem to be vestiges of these 'cycles of nature' in the Nobody Village poster in the description of the crops, seasons and rains. Nature is described as being "exposed to different climatic factors such as heavy rains, strong winds and thunderstorms". Here there are traces of the variability, unpredictability, and tempestuousness of nature, which is represented as an agent: "The land

enables people to plant maize, peaches, sweet reed, watermelons and other types of vegetables”.

In the rural village posters, the need for nature to be harnessed and mediated is emphasized. Although some groups shift to this position, the Goat / Efolweni Village texts seem to be consistent in their representation of nature – namely, that the ‘civilized’ and the ‘developed’ can only be achieved through boundaries between humans and nature. In the written report, Andrew provides a sense of the harshness of the environment of the village, but suggests that the village works against itself in some obscure (even mystical) way: “No sophisticated materials can be used because the place by itself is unfavoured by its own infrastructure”. In the Goat poster, where nature is harnessed for culture, boundaries are set between ‘natural’ and cultural spaces, and the ‘natural’ is excluded from the realm of the ‘civilized’ (the ‘kraal’). This is similar to the representations of nature in the Efolweni Village poster. Here nature is represented as synonymous with underdevelopment, whereas circumscribed and controlled nature is represented as ‘developed’. Direct contact with nature is deemed undesirable whereas mediated contact with nature signifies development. In the ‘before’ scenario on the Efolweni Village poster, nature is represented as encroaching on ‘civilization’ – the children and material objects are in direct contact with the earth, which has the status of dirt. In the ‘after’ scenario, boundaries have been set. There is no vegetation in the domestic realm and there is only mediated contact with the earth.

The Ingogo Village poster also represents the need to tame and harness nature (the suggestion of a ‘garden’). However, in this poster, there is not the strong need for boundaries between humans and nature that the Efolweni Village poster espouses. Also, there is a sense that nature should not be disturbed too much: “During housing development the vegetation that is cleared must be as little as possible and in disturbed areas the vegetation must be re-planted”. The latter imperative specifies appropriate environmental behaviour for the common collective good over individual gain.

I have argued that in the rural village texts development is largely constructed as the taming or harnessing of nature. In this view, nature is no longer seen as an agent in people’s lives, nor the provider of mystical signs. In order to fully understand what sustainable development could possibly mean in a country like South Africa, these views of nature and the relation

between the social and the natural need to be explored with the students. They also need to be discussed alongside students' views of 'rural' and the perceptions of rural as 'lack' (as discussed in chapter three, section 3.3.1).

8.5 Mixing of primary discourse and metalanguages

In chapter two (section 2.5.3), I discussed Bernstein's notion of 'recontextualization' which is useful to return to now in thinking about the concept of metalanguage. According to Bernstein, recontextualizing rules regulate the formation of academic or pedagogic discourse. These rules mark who may transmit what to whom and under what conditions and they attempt to set the outer limits of legitimate discourse. "When a discourse moves, through recontextualising, from its original site to a pedagogic site the original discourse is abstracted from its social base, position and power relations" (Bernstein 1996: 53). The ways in which students' primary discourses are recontextualized in the pedagogic setting can be brought into conscious awareness.

An interesting example of 'recontextualization' is the 'flowerish' discourse created by the Flowers/Nobody group. 'Flowers' are used to carry 'democratic', religious, environmental and political discourses. The students were able to draw on their primary discourses to reflect on the academic context and the engineering profession.

As flowers reflect good communication skills such as showing love to some one practically by giving him flower, working together as a team of different people of different national groups, sharing property like different flowers share a particular part of fertile soil to grow, this is all what engineer does. (Mbongiseni's written reflection)

Here the student sets up an analogy between the way flowers "share a particular part of fertile soil" and the sharing and team work necessary in engineering practice. In their written reflections on the project, another student attempted to link the notion of 'team work' and unity with the metalanguage of the course as a whole, namely 'development'.

This project is ... relevant to me as an engineer because in engineering there is lot of destruction, which may lead to destroy some important things such as flowers. Since I know the importance of flowers in some contexts, I will know what to do if I have to work in that context. It is either I stop destruction which may destroy or I change a plan of my work. (Mthoko's written reflection)

Here the student equates flowers with nature as well as with something fragile. He maintains that insensitive development, or development without careful thought, could lead to the

“destruction” of nature or other fragile entities. It is interesting that he makes a link between engineering and destruction, rather than linking engineering with development.

The extended metaphor of ‘flowers’ is used as a basis for a metalanguage to comment on things other than the course curriculum and engineering, such as on aspects of political and religious beliefs:

In areas where there are flowers, there is usually not any other species except flowers of different kinds. This encourages people if they can combine together regardless of their colour they can win or beat enemies. As this is shown by flowers when a different species grow between the bunch of them it dies out. In church people use to display this. This is done in an intention to show that if Christians can join together they can beat devil or any evil spirit. (Mbongiseni’s written reflection)

The notion of team work in a professional setting is broadened here to include a kind of religious militism, and ‘us’ and ‘them’ scenario. Unity in spite of diversity is emphasized: people should “combine together regardless of their colour”. However, the new group thus formed is established in opposition to another, the “enemies”. A similar opposition is set up when the student uses the ‘flower’ as carrier of political discourse.

I would also go and plant more flowers in Zimbabwe more specifically next to where President Robert Mugabe lives. This can change his attitude and make him realise that we have to join together as people of different colours to win the devil, which is trying, to rule in the country. (Mbongiseni’s written reflection)

Here the ‘flower’ is not used in the sense of ‘peace and love’ associated with the hippie movement of the 60’s and 70’s. Rather, the student builds on his previous idea of creating unity in order to oppose something, in this case “the devil which is trying to rule”.

According to Bakhtin, ‘internally persuasive’ discourses are ways of meaning with which the individual has dialogically engaged through questioning and exploration in order to develop a newer way of meaning (Bakhtin 1981: 346). This ‘persuasive’ discourse is an interesting way of thinking about the metalanguage developed by the students in the Flowers poster.

Metalanguages can be more dialogic (emphasizing the relativity of meaning) or more monologic in form (imposing meaning on something). Using flowers to talk about concerns in engineering, like team work and consideration for nature in development, reveals that students are exploring and playing with concepts in order to come up with innovative ways of meaning. A dialogic metalanguage can also set up a parodying distance between the students and their textual productions. For instance, the statement ‘we killed the world’ on the bottom

right of the Pants on Women poster is a meta-reflective, tongue-in-cheek concluding statement couched in contemporary 'cool lexicon'. It passes comment on the students' production of the poster and successful completion of the task at hand, and has very little to do with the topic itself. (This discussion of metalanguage and its implications for curriculum is extended in chapter 9, section 9.6.)

The development of these metalanguages from students' primary discourses and other secondary discourses was largely unsolicited. In this way the students often created their own space for reflection on the course. For example, Nandi incorporates thoughts on the research process into the final written report. In her introduction she mentions the 'constraints' of the research. However, she does not mention constraints located in the material context of the research site, but speaks about the constraints of the research process. These constraints include her access to sources, the trustworthiness of sources and her ability to select sources:

In a very long process of my research I came across many constraints such as the information was insufficient and misleading because it was very old and not trustworthy. The abundance of resources was also a problem because time was limited and there was a lot to choose from. (Nandi's written report)

This reflection on the research process is a highly personalized account and is foregrounded in the written report. The difficulty of doing research comes through in other places in her writing where, for example, she says the consultants "were willing to try their best". Reflection on the research process is not something that was given space in the curriculum and yet some students felt the need to foreground it.

In the Efolweni Village poster, the students also include reflection on their representation into the representation itself. The emphasis on the course on reflection on practice and metalanguage seems to have resulted in the blurring of generic boundaries where there is an uneasy mix of engineering content and meta-commentary on the representation of that content. This self-reflexivity is indicated in statements such as "this is the visual feedback of the team by means of a poster". Also, "the poster is designed to simplify things for both the villagers and the involved professions, e.g. engineers. On minimising the costs of the overall project, the most simpler and naturally occurring materials were chosen". The content and comment on the representation of the content are presented equally, in no hierarchical relation. This could indicate the students' possible confusion about the two thrusts in the curriculum: that of rural development and that of 'representation'. This confusion could result

in an unclear sense of intent and audience. The engineering content is realized through the visual mode and the reflections on representation are realized through the written mode. In this way, metalanguage is realized through the written mode, where the written is used to reflect on the visual mode.

The ways in which students' primary and other secondary discourses are recontextualized in the academic context to form metalanguages can be encouraged in the curriculum. These metalanguages can be more or less dialogic in form, either closing down meaning or opening up a space of 'play' or parody. When metalanguages are included in the texts themselves, generic boundaries are questioned and opportunities for discussion of generic and conventionalized forms are created.

8.6 Similarities in ways of organizing knowledge in students' texts

In analyzing the ways of organizing knowledge across the students' texts, I have looked at the ways in which representational entities are related and the patterns which encode experiential meanings. I have concentrated on ways of arguing, narrative and conceptual structures in students' texts. Narrative structures represent actions and events which unfold over time, as well as processes of change. Conceptual structures represent participants in terms of a particular classification.

I was looking for changes in the ways of organizing knowledge across the students' texts, and instead found that there were more similarities than differences. Although the discourses change together with their attendant coding orientations, what this analysis has revealed is that the underlying ways of organizing knowledge in students' texts remain fairly consistent. There are certain similarities in the narrative patterns and conceptual frameworks that persist across both unregulated and regulated genres. It seems to me that these similarities can be utilized in teaching 'scientific' ways of thinking and representing. In the less regulated space at the beginning of the course, the students produce texts with particular organizational features, drawing on their acquired knowledge of the genre to date. This knowledge needs to be brought into conscious awareness and likened to the features of regulated genres in the engineering discipline. For instance, students battled with conceptual structures in the written mode of the formal report genre, yet the unstructured Symbolic Object posters revealed sophistication in conceptual representation. Using the representational resources that students

bring to the academy to describe the conventions valued by the discipline would put these resources to astute pedagogical use.

8.6.1 Argument

Competence in academic practices involves understanding academic discourse as a form of argument. Wulf describes engineering as “design under constraint” (2004: 313). Argument in the engineering discipline takes the form of systematically evaluating phenomena against certain specified criteria in order to make enlightened decisions on the most appropriate fit for a particular purpose. In organizing knowledge in this way, the processes of classifying occur at a high level, with classifications weighed against each other in complex, multi-faceted judgements. This way of arguing links the abstract to the particular, the general to the context-specific, innovation to pragmatism – all of which are crucial conceptual resources for students of engineering.

Argument, in the above sense, tends to be stronger in the rural village posters than in the written reports. The predominant rhetorical intent of the written reports is description (of types of technology and ‘procedure’), whereas the predominant rhetorical intent of the rural village posters is argument. This was an unexpected outcome as the students were given similar briefs for both written reports and rural village posters. The prevalence of argument in the posters could be an affordance of the visual mode and the poster genre where information needs to be more compact and concise. The genre of the investigative report, predominantly in the written mode, enables sequence and description, whereas the genre of the poster, predominantly in the visual mode, enables spatial composition and display. The fact that argument tends to be stronger in the rural village posters could also be due to pedagogic reasons – the placing of this curriculum task at the end of the course. Perhaps because of the ‘open’ nature of the task the students’ predominantly visual representations of symbolic objects have differing rhetorical intentions (including description, exposition and argument).

Based on the analysis of the students’ texts, it appears that highlighting the differences between persuasion and argument could be an important exercise in discussing the constructions of academic discourse with students, as well as ways of inserting one’s own voice into academic discourse. In the Pants on Women poster and the Efolweni Village poster, there is some confusion between the rhetorical intent of persuasion and of argument. The persuasive rhetoric in the Pants on Women poster is realized through debate and

statement of personal opinions. This persuasive rhetoric shifts in the Ingogo Village poster where the argument becomes less personal and is couched in language with a high degree of authorial distance. It would be important to highlight to students that couching argument in depersonalised academic discourse does not necessarily reduce the strength of the writer's conviction. In scientific discourse, the criteria are the underlying belief system or ideology constructed in the text. In order to understand academic practices, it is necessary to realize that it is possible to insert one's own identity in textual representations. It is also important to realize that the texts one encounters are not neutral, but are ideologically laden from particular perspectives. This awareness is part of becoming a critical producer and interpreter of texts.

8.6.2 Narrative structures

Narrative structures do not feature in the Flowers / Nobody Village texts and Pants on Women / Ingogo Village texts, but define all of the Goat / Efolweni Village texts. Both the Goat poster and the Efolweni Village poster have a strong narrative thrust with clear participants and defined vectors of action. Both are linear texts in that they describe the sequence of and the connection between the elements. The composition of the Goat poster is strongly framed in a 'before' and 'after' structure by a strong vertical frame line which divides the poster into two equal squares. The Efolweni Village poster is similarly tightly framed in a 'before' and 'after' structure which is organized along the horizontal axis.

Narrative has a number of affordances. Narrative structure can be used to represent sequencing in time, but can also be used to represent change from one state to another. Both posters depict this change through the medium of technology. In the diagram of the goat, the physical is changed into the spiritual through 'technological' interventions, although this is a different kind of technology and science to Western versions. The Efolweni Village poster comprises a binary of the 'bad' (before) and the 'good' (after) and constructs the intermediate step as 'progress'. A state of desperation is changed into a state of well-being through technological interventions developing the infrastructure of the village.

Although both posters are narrative in form, narrative defines the structure of the Efolweni Village poster more than it does the Goat poster. In the Efolweni Village poster, there is a sense of both process and system, and the 'outcomes' of the process are represented. In the Goat poster, process is turned into system, and the static order of display emphasizes

temporal stability. The ‘outcomes’ of the slaughtering process are not represented. Although the process of slaughtering is depicted over time, the analytical nature of the poster creates an impression of timelessness. Actions over time are represented as spatial configurations and all elements are spatially co-present, thus turning the ‘process’ of dissection into a system.

8.6.3 Conceptual frameworks

8.6.3.1 Binaries

Binary logic is an integral feature of certain kinds of academic discourse and it is worth alerting students to the ways in which it functions. Binaries can indicate either trajectory from one state to another or opposition. The binaries which operate in the visual mode in the Goat / Efolweni Village texts are used to structure change from one state to another (the later state being in opposition to the initial state). This type of binary fits into a narrative structure. The visual mode lends itself to these kinds of before / after binaries. Considering the nature of the rural village project where some kind of change is imperative, it is not surprising that the students produced before and after narratives. The binaries which operate in the written reports are different to the narrative binaries. They set up oppositions rather than indicate change (for example, the binaries of advantages and disadvantages). This type of oppositional binary fits into an analytical structure. However, this type of analytical binary is not restricted to the written mode; the Flowers and Nobody Village posters also operate on a system of analytical binaries. In the Flowers poster, the abstract is linked to ‘generalized’ meanings and to nature, and is in opposition to the ‘particular’, which is shown to be context-specific and linked to culture. The binaries operating in the scientific discourse of the Nobody Village poster are clear, separated out, reified ‘advantages’ and ‘disadvantages’ of particular technologies.

Whether narrative or analytical, binaries are never neutral. One pole of the opposition is always valorised, and binaries can be used to manipulate the reader into particular positions. The assumption that change and westernization are more desirable than tradition manifests in the binary ‘traditional versus modern’ and all subsequent binaries slot into this hierarchical classification (like mud versus bricks). However, a critical reader would be alert to these kinds of manipulation and would be able to resist and interrogate them. Also, a critical reader would be able to read between the binaries and detect instances of nostalgic discourse which do not easily fit into a binary framework.

8.6.3.2 The relation of the particular to the general

Theorizing the relation of the general to the particular is crucial in engineering. Theorizing can be both descriptive (backward-looking) and predictive (forward-looking). One can generalize from the specific instance, as well as make predictions about specific cases based on the general. Key to 'generalizing' is the underlying classification of concepts according to categories. For instance, in the Pants on Women / Ingogo Village texts, the participants are represented as 'types' of a generalized concept rather than as individuals or unique objects, and context is de-emphasized. The Flowers / Nobody Village texts also consider particular and general meanings. The way in which representations are contextualized forms the basis of these classification systems in the Flowers / Nobody Village texts. The concepts on the Flowers poster are classified into the generalizable, which can be either symbolic or scientific, and the particular (connected with a particular location and cultural milieu in a specific moment in time). When the technologies are described and evaluated on the Nobody Village poster this is sometimes done in a generalized way in which technology is viewed as independent of context. However, when the students attempt to match the technologies to the specified criteria, then the specific context of the village is considered. The general principle exemplified here can be discussed with students because the ways in which criteria constrain design according to context is important in engineering discourse.

8.6.3.3 Analytical hierarchies

Even though the Goat / Efolweni Village texts are organized according to narrative processes (as demonstrated in section 8.6.2), both posters have two types of analytical hierarchies embedded in them. In the Goat poster, the first hierarchy shows steps in a process, the second shows the division of the whole into parts. The goat functions as the 'carrier' and the internal organs function as 'possessive attributes' or the parts that make up the whole. The Efolweni Village poster is also organized in terms of these two analytical hierarchies. The first hierarchy shows steps in the process of development (before, intervention, after). The second hierarchy divides the whole into parts. The final well-functioning village ('the carrier') is divided into its infrastructural elements (attributes). Demonstrating how the parts make up the whole is done through naming and labeling.

In the Pants on Women / Ingogo Village texts there is a similarity in the underlying conceptual pattern of the division of the whole into parts, although the pattern is realized in modally different ways. Phillip's written report on Ingogo Village is organized according to a

part / whole structure, as is the Ingogo Village poster. The concept of ‘environment’ is divided into water storage, renewable energy, community gardens and the combating of soil erosion. In the Ingogo Village poster the same conceptual framework operates, except that the ‘whole’ is a somewhat larger concept, namely ‘rural development’, and the parts comprise the different infrastructural aspects of the village. In Phillip’s written report and in the Ingogo Village poster, the underlying conceptual pattern of the division of the whole into parts is realized in modally different ways. In the written report, it is realized through headings and sub-headings which form classification taxonomies. In the poster, it is realized through compositional design (colour coding, font consistency and spatial arrangement).

Classification taxonomies and analytical hierarchies are an important aspect of scientific discourse. They are the epistemological resources which support progress in the engineering degree. Discussing with students how these hierarchies operate in textual practices could bring these practices into conscious awareness in order to gain mastery over them.

8.7 Affordances of modes and modal specialization

In moving through the different genres, students display certain kinds of representational behaviour. I have attempted to demonstrate which representational resources are preserved and which are suppressed or changed in the transitions from an unregulated genre or assessment task to a more regulated one. Now, I attempt to look at the influence of modes on the utilization of representational resources. Remember that mode is defined as “that material resource which is used in recognisably stable ways as a means of articulating discourse” (Kress and Van Leeuwen 2001: 25).

The act of moving between one mode and another is extremely important in students learning different kinds of academic practices and gaining greater control over their thought processes. A multimodal view of pedagogy sees transcoding of meaning from one semiotic mode to another, the movement between modes, as semiotic competence (Kress 1992: 193).

According to one student, the report genre and written mode enable him to elaborate on details and provide a cause and effect reasoning (“In the report you have to elaborate ... you try to find the reason behind things ... What happened, what caused that”), whereas the poster genre and visual mode are about display and immediacy (“in your poster you have to like just be sure and straight to the point, cause posters like are there”).

8.7.1 Affordances of the visual mode for EAL students

It appears that with certain students, representation in the visual mode enabled engagement with complex analytical processes. In the Goat/Efolweni Village group, analytical writing seemed problematic for the students, whereas analytical drawing appeared less difficult. There is not much dissection and analysis in the written mode of the Efolweni Village written reports as compared to the highly analytical processes realized in the visual mode in the Goat poster and the Efolweni Village poster. Analytical hierarchies are largely absent in Andrew's written report. The 'flatness' of categories is realized through descriptive and discursive writing. In this case the choice of the visual mode of representation enabled the utilization of different cognitive processes. The choice of mode could have implications for students who have English as an additional language and struggle with abstract or analytical representation in the written mode.

8.7.2 Shift towards the dominance of the written mode

In the shift from the Symbolic Object posters to the rural village posters, the written mode becomes the more important mode for representing information. The Flowers poster and the Pants on Women poster use the visual mode as a carrier of information more than the Nobody Village poster and the Ingogo Village poster, both of which are more writing-led. In the Flowers poster, the pictures are spatially dominant and the captions are beneath them. On the other hand, the blocks of written text are the organizing principle for the Nobody Village poster. They are placed in sequential order, and the photographs are used to fill the spaces in between. The outcome is that the overall design of the Nobody Village poster is firmly writing-led.

Similarly, in the shift from the Pants on Women poster to the Ingogo Village poster, the written mode becomes more dominant. In the Pants on Women poster, the visual mode is dominant and small sections of written text are arranged around the images. The visual mode enables the classification of 'types' in a way that the written mode does not on the poster. In the Ingogo Village poster, the written mode is dominant over the visual mode. The written mode here is well-suited to explicate both the parallel narrative structures in each individual unit, and the representation of the units as equivalent parts of the whole (although the latter is also achieved through the visual mode, through the use of colour to frame and separate units).

There is not a significant shift from the visual to the written mode in the Goat and Efolweni Village posters. In these posters the meanings of the representations are realized predominantly in the visual mode. In the Efolweni Village poster there is a sense of the need for the written mode, but this writing has an 'add-on' quality and the meaning import is almost superfluous to the visual mode. Perhaps the shifts from the visual to the verbal mode reflect students' expectations about the form of 'academic discourse', that the written text needs to dominate.

8.7.3 Modal realization of scientific discourse

Scientific discourse is a semiotic practice which has evolved functionally to do specialized kinds of theoretical and practical work in social institutions. A key feature of this semiotic practice is the theoretical work of abstraction and it is important to explore the link between mode and abstraction. All modes allow for any range of abstraction. It is the means by which abstraction is realized that may differ across modes. The Nobody Village group chose not to represent abstraction in their visual material, the photographs, although abstraction could have been realized through composition, lighting, camera angles and visual metaphors. The Efolweni group, on the other hand, chose to represent abstraction through the use of diagrams, which enabled the depiction of a 'cross-section' view, and the labelling of parts.

In my analysis of the students' texts, I have argued that scientific discourse has both visual and verbal realizations. There is an increasing regulation of the visual when looking at the transitions from the Symbolic Object posters to the rural village posters. However, it appears that academic discourse manifests more strongly in the written than in the visual mode in the students' texts. This is not surprising considering the fact that students consistently encounter academic discourse in the verbal mode in reading and in lectures. As the students progress through the course and their first year, familiarity with ways of thinking in engineering and the attendant parlance increases.

8.7.4 Modal realization of affect

The visual mode appears to be more conducive to the expression of affect than the written mode in this particular context. The written reports for the Flowers / Nobody group are more technologically orientated than the poster, with details given in the written reports on the different technologies investigated (different types of road construction, water supply options and renewable and non-renewable energy sources). This technical detail is couched in

scientific technological discourse which serves to create a disjunction between everyday common sense knowledge and the systematized knowledge of the engineering discipline. Affect manifests in traces of other discourses within the dominant scientific discourse and is realized through lexicogrammatical constructions and typographical choices (bold and italics). These manifestations of affect differ from the Nobody Village poster where affective dimensions are largely suppressed in the written mode resulting in more 'seamless', less dialogic writing than that of the written reports. Instead, affect is realized through the visual mode, the photographs, together with the captions. The ordinary personal experience of the village roads as represented in the photograph on the poster entitled "Dust leave me alone" is described in the written report as "conditions of roads in Nobody are retarding the pace of business effectiveness" (Mthoko's written report). The everyday experience of queuing "until you dry out" represented in the photograph on the poster is described in the report as: "More water supply systems are required in the village" (Mbongiseni's written report). Here the genre of the poster is able to accommodate humour, human values and the ordinary, whereas the technologically oriented discourse of the written reports is impersonal, objective and humourless. Although in conventional engineering settings, the poster should be couched in standard Western scientific discourse, it is in effect a less regulated genre than genres dominated by the written mode and this allows more scope for interpretation.

The types of images chosen realize the affective dimensions of representation. On the Nobody Village poster, the types of images help to realize the personal. The students chose to produce visual images that have high modality in the naturalistic coding orientation. They did not choose any of the images that they used in their written reports for use on the poster. These images from the Internet were mostly generic representations of a 'type' of technology (like a windmill, for example). Instead, the students chose context-specific representations of place for the poster. In the Pants on Women group Nandi reports on the sense of the photographs being extremely evocative in 'capturing' the atmosphere of the moment ("all the tension, laughter, excitement and angry atmosphere"). She makes a link between memory and mode: "when you look at the photos you will reminisce the actual words spoken".

The actualization of affect is different in the written and visual modes. In the written mode, affect is actualized through the students' use of the strong modals as well as through typographical choices. A device used for intensification in the students' reports is the use of bold face type and italics. Here the resources of written language would be used for emphasis

(as opposed to grammatical parallelism, for example, where the resources of spoken language are used). Affect is realized in the visual mode through composition, through the viewer's orientation to a represented object. For instance, in the Efolweni Village poster, the represented participants engage the viewer through direct address. This is different to the Goat poster where direct address is absent and the audience is constructed as an external 'viewer' rather than a participant in the representation. Engagement here is achieved through the vectorial composition; the goat faces left to right and focuses the attention of the viewer onto the processes of its imminent demise.

Exploring the affordances of modes and modal specialization with students seems to be a vital part of a Communication Course, particularly in the context of tertiary education in South Africa where there is diversity of student experience and competencies. It is important to highlight that scientific discourse has both visual and verbal realizations, and to explore the dimensions of this in a discipline like engineering which has always been visual in orientation. The potentials for realizing affect in the visual mode can be discussed in terms of questioning the boundaries of scientific discourse and redefining the poster genre in engineering (a genre which is not yet regulated to the same extent as genres in the written mode).

8.8 Reconciling experiential knowledge with researched knowledge

It is clear from the preceding analysis of the students' texts that different kinds of knowledge and competencies from a variety of contexts serve as resources for students in meaning-making. These knowledge contexts include experiential knowledge (based on students' life worlds and life experiences) and researched knowledge (based on secondary sources, both oral and written).

Predictably, the Symbolic Object posters tend to foreground experiential knowledge, whereas the written reports and rural village posters foreground researched knowledge. There are thus differences in the hierarchical relations set up between experiential and researched knowledge within the different texts. I will look at the Flowers / Nobody Village texts as an example of this. In the Flowers poster experiential knowledge is foregrounded, namely the students' experience of the object within particular practices. The Flowers poster draws on folk knowledge and systems of belief. Within the Flowers representation there is no indication of the status of knowledge; explanations based on 'belief' are given equal authority to 'scientific' explanations. The status of knowledge changes in the Nobody Village poster

and written reports where a hierarchy of knowledge is established, with researched knowledge foregrounded. The systems of belief (religious and cultural) which are foregrounded in the Flowers poster are omitted from the Nobody Village poster. The emphasis here is on the infrastructural aspects of the represented village. The Rastafarianism of the Flowers poster (the emphasis on the reproductive cycles and cycles of nature) is vaguely echoed in the Nobody Village poster in the environmental discourse and the references to “peaches, sweet reed, rains”. So, mystical knowledge is still present in the poster, but has far less prominence than researched knowledge. Although the rural village texts foreground researched knowledge, they do also draw on experiential knowledge. For instance, the Efolweni Village poster seems to be drawing on general and experiential knowledge of rural villages in South Africa. This probably explains why there is no bibliography to reference outside sources.

In setting up hierarchies of knowledge, certain kinds of experiential knowledge seem to be suppressed in the more regulated engineering genres. An example of this is mystical knowledge. Systems of belief were the subject of discussion in thinking about development in Nobody Village (for instance, naming mythologies and witchcraft), but were not included in the final poster. Religious discourse is the framing discourse for the Pants on Women project, with the image of the church dominating the representational design. In the Ingogo Village poster, religious discourse is largely absent, although a sense of propriety remains. In the Efolweni Village poster, the mystical has been suppressed. However, the Goat poster reveals in interesting ways that the mystical is simply a particular form of reasoning, and students are able to draw on mystical knowledge which is the ‘scientific’ knowledge of a particular grouping.

Students are able to make translations between various life worlds and coding orientations (as habitualized forms of representational practice in particular communities) with varying degrees of success in terms of the curriculum. Schutz (1970) stresses that there is no formula for passing from one to another of the provinces within our life worlds. The translations between these provinces are always experienced as more or less of a shock because each province tends to have its concerns, activities and semiotics. In chapter two (section 2.5.1.2), I mentioned Schutz’s notion of a ‘stock of knowledge’. The ‘stock of knowledge’ includes “the set of practical recipes for attaining typical ends by typical means – recipes which have “stood the test” thus far and are therefore taken for granted” (1970: 72 – 73). The ways in

which these 'recipes' or habitual ways of thinking and acting are drawn on in the curriculum has implications for knowledge production. For instance, all the posters (except the Pants on Women poster) draw on scientific textbook conventions, 'recipes' from the school context. The use of typographical features such as bold, bullet points and italics to highlight key points draws on these conventions. In the Flowers poster, the 'before' and 'after' representation of the marijuana plant has provenance in textbook genres, as does the language of school biology ("the spreading of the adventitious roots"). These examples indicate that representational resources include experiential knowledge, as well as school-based knowledge.

It is interesting that although certain kinds of experiential knowledge are suppressed in the more regulated genres, in general, there is consistency in orientation across the texts of particular groups of students. As I argued earlier in the chapter (section 8.6), this consistency is evident in the coding orientation, discourses and underlying ways of organizing knowledge of the students' texts. Students' life worlds and domains are evident in their textual productions, but different aspects are foregrounded depending on the context and the audience. Text producers are socially situated subjects who have to select from a range of language and visual resources and discourse practices. Representational resources are also about student expectations – the students produce texts which reflect their expectations of what the academic system requires or values.

8.9 Final comments

My analysis has revealed that the students demonstrate knowledge of what constitutes scientific discourse, although employment of this discourse is variable across the students' texts. This variable employment is related to 'competency' as well as to identity issues. For instance, the students demonstrate an awareness that lexical choices constitute academic or scientific discourse. However, their lexical choices are also inextricably linked to identity statements (their use of local lexis, for instance). There is a move from mixed domains of practice in the less regulated genres to more firmly delineated domains of practice in the regulated genres. The texts demonstrate an awareness of the need for authorial distance in the regulated genres, and in general there is a shift from a personal voice in the unregulated Symbolic Object posters to a more distanced voice in the regulated genres. In the Symbolic Object posters there is a strong sense of identification with the subject matter and debates (the meaning of flowers, slaughtering a goat, wearing pants); whereas a more ambivalent

identification is evident in the rural village texts (the 'us' and 'them' shifts in these texts). The identification with a role ('consultant engineer') perhaps invokes more of a distance from the issues of development which sometimes results in complex constructions of the 'other'. The sense of identification is evident in the strong and overt discourse of propriety in the Symbolic Object posters, and the more openly contradictory discourse of propriety in the regulated genres.

My argument is that moving between life worlds can result in 'mixed' genres where differently organised social worlds and their attendant coding orientations appear. However, to speak of 'mixed genres' is to construct genres as stable, fixed forms. Rather than thinking of 'mixed genres' (since mixing is normal), we can think of genres and generic fragments embedded in and forming a part of the overall text. Perhaps the terms 'alternate' or 'emerging' genres might be more useful. Within a general awareness of the range of genres, of their shapes and their contexts, speakers and writers newly make generic forms out of available resources. For instance, the students built reflection on the process of production into the final textual product in both the written reports and the rural village posters. Also, the students' textual productions create space for the personal as well as the mystical in standard academic genres. In these alternate genres, discursive struggles between authoritative discourses and 'internally persuasive' discourses (Bakhtin 1981) are prevalent.

In order to set up a 'reciprocity' and exchange of cultural practices, I have attempted in this study to identify the representational resources that diverse students draw on in the production of a range of genres in the academic context. After describing these resources, I have looked at shifts and similarities in the ways in which these resources are utilized in less regulated and more regulated genres in a Communication Course in engineering. In looking at representational resources, I focused on student 'interest' in using particular forms. I have argued that in the more regulated genres, students consciously begin to draw on a more scientific academic discourse to create a disjuncture between everyday commonsense knowledge and the systematized knowledge of the discipline. The following and final chapter elaborates on the principles of a 'reciprocal curriculum', how to provide access for students without simply socializing them uncritically into academic practices and how to foreground traditionally excluded resources.

Chapter Nine: Reciprocal Curriculum as Transformative: Harnessing Students' Representational Resources

9.1 Overview of chapter

This chapter draws out the implications of this study for curriculum design and addresses research question three: "How can students' representational resources be drawn on in curriculum design in tertiary education to develop a pedagogy of diversity and unity?" I argue for a 'reciprocal curriculum', a curriculum where students' practices and traditionally excluded resources would be utilized and validated, whilst the discourse and knowledge of the discipline would also be made available and accessible. I explore ways of sensitizing learners to the communicative demands of the engineering discipline. This involves processes of 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. We can harness students' representational resources through making these resources visible, developing metalanguages to describe and reflect on practices, and creating less regulated spaces in the curriculum where they can be used. 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 all experience are recognized, and multiple forms of representation are encouraged (including variable modal realization of scientific discourse).

9.2 Curriculum as transformative

As mentioned in chapter three, 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, in my experience it 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 1999). This transmission pedagogy is positivistic in nature and threatens to atomize and compartmentalize curriculum knowledge into distinct units. According to Jansen,

by organizing 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 transmission pedagogy, the reciprocal curriculum which I propose encompasses a transformative notion of pedagogy. Rather than focusing on learning outcomes in this research, I have focused on forms of semiosis, as the transformation of meaning.

I use the term 'transformation' both in the sense of transformation of the sign, as well as transformation of society, in this case through pedagogical practices. In chapter 8 I analyzed how the students transformed signs from one context to another. In this chapter I will look at transformation in the larger societal sense. A transformative theory of representation constructs meaning as a process of redesigning signs in response to others. When signs are interpreted they are transformed into new ones in relation to the interest of the sign-maker. A transformative model of pedagogy also emphasizes 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 (1992a: 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 entails validating the resources from previously disadvantaged groups in our society.

9.3 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. Currently we are in a period of flux and transition where boundaries between practices are being debated, as are boundaries between academic disciplines and domains of knowledge. This loosening up of academic boundaries is a global phenomenon, not only a political one, as in South Africa. 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).

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 both personal and societal practices. In traditional first year engineering courses, knowledge is atomized into subjects like maths and physics which are not always applied directly to real world contexts. A curriculum which draws on and validates students' practices, resources and discourses is invaluable in this context, as students interrogate their past situation and their aspirations. They also start to think critically of engineering as a profession within the context of South Africa. This kind of curriculum in engineering coheres with a general international shift in the professional disciplines towards the subjective, the affective and more 'humanities' type concerns. There is a trend to create a balance between technical and non-technical aspects in engineering education and curricula designs worldwide (Wulf 2004; Horack 2003; Bugliarello 1991). Evident in this trend is the acknowledgement that engineering is a social activity with political, ethical and economic dimensions. 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 (Evans 2002; Kneebone 2002; Charon 2001).

Although engineering education is dominated by a positivistic 'scientific' paradigm which assumes the existence of a single objective external reality, it is important to recognize that not all questions can be approached in this way. Observing the world from a '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 inexorably 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 canonized and naturalized 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. I have argued (in chapter eight, section 8.8) that the Goat poster reveals that mystical knowledge may have the same function as science in particular communities. Mystical knowledge is a locus for constructing relations between elements in the natural world, and comprises a different form of reasoning to scientific knowledge in a Western empiricist tradition. The students who produced the Goat poster were able to draw on mystical knowledge as the scientific knowledge of that community.

Bernstein (1996) points out that power is maintained and relayed through the creation of boundaries between practices, and it is often in 'mixed' forms where power is played out. Because boundaries demarcate and protect what is valued, they act as insulations with regard to the 'purity' and 'mixing' of categories and discourses. In this study I have examined what happens when different representational resources encounter a range of genres and forms, and explored the ways in which these forms have been recreated. In my analysis it is clear that 'breaking' or reinterpreting some standard generic conventions often signals an encounter of diverse knowledges and differently organized social worlds. For instance, both the Nobody Village poster and the Efolweni Village poster constitute a 'mixed' or 'alternate' genre where the disjuncture between the written and visual modes constitutes two generic positions. Because these two generic positions are realized in different modes, the disjunction is not readily apparent. The visual mode of the Nobody Village poster conveys nostalgia, affect, the everyday world; the written mode conveys a technical and abstracted world. In many of the texts, the familiar world of the everyday which draws the viewer in by identification with the actors is juxtaposed with theory and abstraction which positions the viewer as a neutral observer of an objectively present world.

9.4 Exchange of cultural practices

Within this current period of flux, it becomes not only possible but imperative to think of curriculum as a two-way exchange of resources rather than uni-directional

transmission. It implies that engineering staff should learn from students, just as students learn from them. In a reciprocal curriculum the discourse and knowledge of the discipline are made available, whilst students' practices, resources and discourses are simultaneously utilized and validated. This is different to a 'responsive' curriculum which is constructed to start from where the students are and move on from there. James Gee (2001) 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 writing 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. 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'. In the conception of a reciprocal curriculum, projects are not simply springboards for students, but are a serious interrogation and utilization of students' representational resources.

In this study I have attempted to interrogate students' representational resources, to describe how diverse ways of thinking and representation are similar to and differ from those in Western engineering, and I have discussed what could or should be preserved. For instance, 'scientific' forms of reasoning from students' life worlds should be drawn on, as well as local lexis used incisively in the scientific domain. Also, cognisance needs to be taken of various social aspects of engineering and their semiotic realization, such as the tensions between tradition and development, nostalgia and utopianism, nature and society, the individual and the collective.

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 recognize and negotiate. Ignoring these discourses and practices would do a disservice to this particular group of educationally disadvantaged students in the present South African context. Hence, a

reciprocal curriculum would need a dual focus, demystifying academic practices as well as recognizing and utilizing students' representational resources.

The aim of a reciprocal curriculum would be to bring discursive and generic conventions into focus – to show what kinds of social situations produce them, and what the meanings of these social situations are. So, a reciprocal curriculum would include highlighting the important features of scientific discourse and looking at how these operate in textual practices. In many ways the work of science is necessarily grammatical: naming, constructing and positioning the social and natural worlds, and doing so in a way which builds social relationships of power and knowledge between writers and readers (Halliday and Martin 1993: 76). Through processes such as nominalization, 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).

It would need to be made clear that textual forms are located in specific social and cultural domains which constrain them by valuing specific genres and discursive practices. Teaching 'genre' in a reciprocal curriculum would mean making knowledge of the potentials of the communication resources available for specific social situations, rather than focusing on specific generic forms. 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, recognizes 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. 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).

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. This tension between convention and change is the effect of the “constantly transformative action of people acting in ever changing circumstances” (Kress 2002: 108). The students’ textual productions represent a negotiation between the institutional demands and the place where the students were when they arrived at university. In other words, the textual representations are shaped both by the students’ understanding of the specific socio-discursive context and by what they bring to the act of representation (the cumulative historical experience of the individual, the habitus).

9.5 Modal aspect of transformation

Each discipline develops its own system of representation which then becomes canonized and the functioning of modal resources in engineering are specific to that domain. The degrees of regulation in different modes and genres in engineering may differ from another discipline. A major contribution of this thesis to theorizing pedagogical transformation is the emphasis on the modal aspect of transformation. I have argued that, depending on the context and the particular students, the modal effect is very strong, and that different modes enable different kinds of being and knowing. Some students struggled with classifications, comparisons and analytical hierarchies in the written mode of the report genre and tended to do better with conceptual structures in the visual mode. For instance, 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; the visual mode is doing more of the ideational work in multimodal texts and is becoming increasingly important as a carrier of information. As argued in chapter eight (section 8.7.1), this could have implications for students who have English as an additional language and struggle with conceptual representation in the written mode.

When thinking about modal specialization, it is useful to consider what aspects of the world are represented in what mode. All modes can realize all functions, but they are pushed in certain directions by particular texts and practices. So, the visual mode is

able to realize both the ideational and the interpersonal functions, but the students in this study tended to use the visual mode to express the 'personal' and the written mode to express the more 'objective'. For instance, nostalgia and utopianism were articulated more in the visual mode than the written. Stein (2003) argues that students use the written mode to express the public self and the visual mode to express a more private self; the visual mode offers more space for ambiguity and expression of the 'unsayable'. For this reason, she argues, different semiotic modes need to be legitimated in the classroom. Thesen (2001) also speaks of the affordances of the visual mode to express personal and affective aspects. According to her, the detachment that typically goes with linear, rational approaches to essay text literacy is difficult to achieve with the intense emotional involvement that often accompanies responses to image (2001: 138). This is certainly the case in the Efolweni Village poster where the direct address of the suffering children is emotionally charged in a way that the description of the social ills in the written report is not.

Affect is not necessarily valued in the discipline of engineering in the same way it is in the humanities, yet it emerges in the students' texts, often in traces of other discourses within the dominant scientific discourse. Alerting students to these traces and their modal realizations could make them aware of how affect is a part of academic discourse, but often in a different form than in the domain of the everyday. For instance, (as I argued in chapter six, section 6.4.3), the 'criteria' of an engineering design project constitute the belief system of the resultant text and often take the grammatical form of the imperative. The pedagogical aim would be to make students more aware of the ways in which they construct scientific academic discourse, and the ways in which they can, and already do, insert their own voice into their textual representations.

Moving between modes does not result in complete transformation of an utterance from its realization in one mode into realization in another. Rather, the utterance is "recast within the potentials of the other mode" (Kress 2003: 130). For instance, scientific discourse can be realized both verbally and visually. In the written mode, scientific discourse is realized through lexical choice and particular grammatical constructions such as nominalization. In the visual mode, scientific discourse is

realized through diagrammatic representation, naming and labelling the represented components, and the organization of information into analytical hierarchies. In both written and visual modes, scientific discourse is realized 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, and I argue that these courses should take cognisance of the different modal realizations of scientific discourse.

In chapter two (section 2.2), I argued that changes in the semiotic landscape have engendered an increasing recognition of the different semiotic dimensions of representation, as well as the realization that the human predisposition towards multimodal meaning-making requires attention. My analysis has revealed that students are alert to epistemological and semiotic shifts, and in this they are ahead of the curriculum with its often monomodal focus on text production and assessment. Utilizing a range of modes of representation in the curriculum is a way of harnessing students’ representational resources. Although drawing on a range of modes is not new in the genres of engineering (such as in proposals, manuals, specifications), I argue that this range needs to be valued through multimodal assessment practices.

9.6 Harnessing students’ representational resources

Along with the NLG (1996), Lillis (2001) and Thesen (2001), I argue that only resources which are visible can become available as elements in conscious design processes. In this way, different ways of thinking and practice in representation become available as resources for students. A reciprocal curriculum would see the importance of reflecting on the functioning of signs in practice and on communication as interpretation. A reciprocal curriculum would also encourage reflection on the affordances of particular modes of production, in terms of purpose, context, and audience.

Students need to be aware of the resources they are drawing on in producing their versions of academic discourse. For instance, it would be important to discuss the complex workings of propriety and how it feeds into processes of ‘othering’, especially since the ideology of propriety works to suppress heteroglossia and naturalize itself as dominant. In the rural development texts, the identification with a new role, ‘consultant engineer’, rather than ‘student from a rural area’, could invoke a

sense of distance from the issues of development, which could feed into constructions of the other. In this sense, self and other are mutually constitutive; identification and objectification go hand in hand. Highlighting the ideological contradictions around development in the curriculum could be a way of getting students to interrogate their own ideological positions.

Although there are shifts in discourses across the students' texts, I was surprised to see that generally the underlying ways of organizing textual knowledge remain fairly constant. The narrative patterns and conceptual frameworks are similar in texts produced in both regulated and unregulated contexts. These similarities in ways of organizing knowledge could be highlighted in order to be utilized in the curriculum in teaching 'scientific' ways of thinking and representing. For example, the structure of the Goat poster is conceptual, representing participants in terms of a generalized and more or less stable essence. The poster is organized into analytical hierarchies which 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 system. This conversion of process into system is comparable to nominalizing in written text, which is an important feature of scientific discourse.

9.6.1 Metalanguages of reflection

Visibility of resources is achieved through developing appropriate metalanguages. Metalanguages of "reflective generalization that describe the form, content and function of the discourses of practice" (NLG1996: 86) are important in achieving conscious awareness of the nature of the resources being used.¹

Certain kinds of reflection require different kinds of thinking, drawing on different lexical and grammatical domains. A metalanguage constituted through combinations of primary and secondary discourses can provide other ways of knowing the world – with the "productive diversity necessary for reconstruction and redesign" (Janks 2000:

¹ Although I acknowledge that metalanguage is not mode-specific, I limit my use of the term to the written and spoken modes (as distinct from the visual).

181). Metalanguages can also perform a bridging function between primary and secondary discourses. Because they are about naming the components of the cultural exchange, they need to be flexible, allowing new terms to enter. An example of metalanguages bridging primary and secondary discourses is the 'flowerish' metalanguage which the students used to describe the ideals of rural development (including peace, unity and happiness). These metalanguages grown from the encounter between students' primary and other secondary discourses and academic discourse need to move to the next 'level', namely the domains of the engineering discipline and of educational policy.

A metalanguage may feed into the language of the 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 the same question, whether or not 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 rural village posters were assessed (see appendix seven for the assessment criteria used).

9.6.2 Creating less regulated curriculum spaces

A reciprocal curriculum would include less regulated spaces in order to increase students' choices and allow scope for reflection. The Symbolic Object project, a largely informal and unstructured curriculum task, created this more open space. The students could choose their own objects for investigation and talk about why certain objects were meaningful to them. The Symbolic Object project thus opened up an opportunity for exchange of cultural and personal knowledge. In this less regulated space, students could experiment with multimodal representation, draw on 'non-academic' discourses (such as religious discourse) and employ humour or irony. They could draw on primary discourses as well as secondary discourses to create metalanguages alternative to those of the engineering discipline, and to make sense of the curriculum. The classroom environment during the production of the written

reports and the rural village posters was, in contrast to the Symbolic Object project, a far more regulated environment.

Finding a legitimate space for this reflection is one of the challenges for a reciprocal curriculum. 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, the students were required to reflect on aspects of 'representation'. They had to write reflections on their poster productions, using the metalanguage of visual design developed on the course. In a confusion of generic purpose, the students of the Efolweni Village poster include their reflection on their representation in the representation itself. Nandi also questions generic boundaries through the inclusion of reflection in her written report. There was perhaps not enough space for reflection built into the course which resulted in the students finding ways of creating their own reflective spaces. In teaching this course again, I would build in more student reflection on the complex transformations of resources across texts. This kind of reflection requires the conceptual incisiveness of a metalanguage.

Less regulated spaces in the curriculum are conducive to a particular form of research, research that is divorced both from regulated environments and the teacherly role of assessor. In some ways the teacher as researcher creates the environment for a reciprocal curriculum and, conversely, a reciprocal curriculum creates space for a different kind of research. The flexibility opened up through the unstructured Symbolic Object project enabled me to develop a methodology for identifying and describing the representational resources of diverse students. The strength of the research methodology developed here is that it links the social with the representational.

9.7 Final comments

The significance of this research is twofold. It has enabled an understanding of how different resources of different configurations are brought together in a range of modes and genres, within a particular curriculum context. It has also devised and implemented a methodology for identifying the representational resources of diverse students in order to utilize these in curriculum design.

I have argued that a reciprocal curriculum would not attempt to socialize 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.

In so far as the role of education is transformation, it is by way of extension of one's repertoire, boundary crossing and expanding horizons, rather than having to leave old selves behind. (Cope and Kalantzis 2000: 147)

A reciprocal curriculum would thus preserve useful ways of thinking and representing in the academic discipline of engineering, but at the same time reveal some of what has been naturalized 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 in South Africa. 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. 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. In South Africa at the moment there are opportunities to embrace diversity and this study has looked at how to reflect these diverse meanings in a reciprocal curriculum. If all people are equal according to the South African constitution then 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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Appendix One

Summary of the content and genres of the Communication Course.

Simulated Situation	Genres	Features of Genres
Apply for job	Letter of application for a job	Persuasive language; how to sell one's skills and abilities
Go for interview	Interview	<ul style="list-style-type: none"> • Appropriate behaviour in an interview • Asking appropriate questions for a particular purpose
Accepted for job, but need a general sense of the politics around 'development', especially in a developing country.	An argumentative essay stating applicability of these concepts to South Africa. It requires research on Intermediate Technology and Sustainable development.	Argumentative essay writing conventions: <ul style="list-style-type: none"> • Thesis statements • Paragraphing • Coherence / cohesion • Referencing / quoting
Problem definition - the needs and constraints of the area and village to be developed	A ' Needs Analysis ' outlining general problems in rural South Africa according to particular portfolios, and also problems specific to their chosen village. This requires research on the area (library / own experience / interviews).	<ul style="list-style-type: none"> • Scientific language - concise, point form • Language of problematization (including defining criteria)
Consultants research areas of expertise to bring back as set of recommendations to the team.	An investigative report with a full set of recommendations. This involves research on the technical aspects of rural development (using the library and on-line sources).	Investigative Report Writing Conventions <ul style="list-style-type: none"> • Synopsis • Introduction • Findings • Analysis • Conclusions • Recommendations • References
The team produces a visual representation of their proposal for development of a rural village	A team produced poster . This is a complex visual text encapsulating and summarising the team's problem analysis and recommendations.	<ul style="list-style-type: none"> • Appropriateness for Audience • Relation between images and text • Visual organization of information
The team presents a poster at a mini-conference for students and faculty members	Formal oral presentation in a conference setting.	Formal oral presentations to real audiences: <ul style="list-style-type: none"> • Structure of presentation • Sense of audience • Body language • Audibility

Appendix Two

Questionnaire

Personal Details

Name:	Student Number:
Home Language/s:	Male / Female:
Name of High School:	Age:
Degree (please tick one):	
Civil Engineering	
Geology	
Electrical Engineering	
Chemical Engineering	
Mechanical Engineering	
Geomatics	
Mother's occupation:	
Father's occupation:	

Media Habits (before coming to university)

1	Television
1A	<i>How often did you watch TV before coming to UCT? (please tick one)</i>
1A1	Never
1A2	Once a month
1A3	Once every 2 weeks
1A4	Once a week
1A5	Every second day
1A6	1 hour and less a day
1A7	2 hours a day
1A8	3 hours a day
1A9	More than 3 hours a day
1B	<i>What kind of programmes do you usually watch on TV? (Please tick as many as appropriate)</i>
1B1	Soap Operas (e.g. Egoli, Isidingo, Backstage)
1B2	Sport
1B3	Comedies
1B4	Films
1B5	News
1B6	Documentaries
1B7	Music
1B8	Cartoons
1B9	Educational

1C	Where did you normally watch TV?
1C1	At home
1C2	At friends
1C3	At other family
1C4	Other (describe)
2	Videos
2A	How often did you watch videos?
2A1	Never
2A2	Once a month
2A3	Once every 2 weeks
2A4	Once a week
2A5	Every second day
2A6	1 hour and less a day
2A7	2 hours a day
2A8	3 hours a day
2A9	More than 3 hours a day
2B	What type of videos do you normally watch?
2B1	Action / suspense
2B2	Romance
2B3	Drama
2B4	Comedy
2B5	Science Fiction
2B6	Other (describe)
2C	Where did you normally watch videos?
2C1	At home
2C2	At friends
2C3	At other family

2C4	Other (describe)
3	Cinema
3A	How often did you watch movies at the cinema or drive-in?
3A1	Never
3A2	Once a year
3A3	Twice a year
3A4	Once a month
3A5	Once every two weeks
3A6	Once a week
3A7	Twice a week

Art Exhibitions / Festivals / Graffiti

4	What groups or communities do you feel you belong to? (please describe)
4A1	How many art exhibitions have you been to? (Give the number.)
4A2	If yes, describe the last art exhibition you went to.
4B1	In the last 5 years, how many plays or community performances have you seen? Describe the one you best remember.
4B2	Are there any other kinds of performances you have attended? (Please describe)
4B3	Name a festival or parade you have been to recently. List as many visual images you experienced there as you can remember.
4C1	Are there a lot of wall paintings and/or graffiti in your community? YES NO
4C2	What messages do the graffiti and/or wall paintings communicate? (provide an example if you can)
4C3	Draw an example of some kind of wall painting or graffiti found in your area.

4C4	Who writes or draws these messages?
4C5	Who are these messages aimed at?

Everyday things that mean something to you

4D1	Can you think of some everyday objects that have symbolic meanings in your community? Describe them.
4D2	Why do these objects have this symbolic meaning?
4D3	Do these same objects mean the same to you now in the context of UCT, or has their meaning changed? (Please describe)

Reading Preferences (before coming to university)

5A. How often did you read the following (please tick appropriate answer):

5A1	Magazines	Often	Sometimes	Seldom	Never
5A2	Books	Often	Sometimes	Seldom	Never
5A3	Comics	Often	Sometimes	Seldom	Never
5A4	Newspapers	Often	Sometimes	Seldom	Never
5A5	Pamphlets	Often	Sometimes	Seldom	Never
5A6	Other (please describe the text and how often you read it)	Often	Sometimes	Seldom	Never
5B	Please name two of your favourites from the following categories:				
5B1	Magazines				

SB2	Books	
SB3	Comics	
SB4	Newspapers	
SB5	Pamphlets	

Internet / Computer usage (before coming to university)

6A1	Had you used a computer before UCT?	YES	NO
6A2	If yes, for what purposes? Describe.		
6B1	Had you used e-mail before UCT?	YES	NO
6B2	If yes, for what purposes? Describe.		
6C1	Had you used the Internet at all?	YES	NO
6C2	If yes, for what purposes? Describe		
6D	Where did you use the Internet? (Please tick all appropriate)		
6D1	Home		
6D2	School		
6D3	Friends		
6D4	Family		
6D5	Work		
6D6	Internet Cafe		

Posters

7A	Describe what you think a poster is.
7B1	Describe the different kinds of posters you see in your community.
7B2	What different messages do they communicate?
7B3	Who writes or produces the different types of posters?
7B4	What audience are they aimed at?

7C	Have you ever had to make a poster before?	YES	NO
7C1	If yes, how long ago did you make the poster?		
7C2	Describe the reason or purpose you made the poster?		
7C3	Were there any words on your poster/s?	YES	NO

7D If you have made a poster before, think about the last one you made. Did it contain any of the following (please tick the appropriate answers):

7D1	Colour	YES	NO
7D2	black and white	YES	NO
7D3	photographs	YES	NO
7D4	maps	YES	NO
7D5	graphs	YES	NO
7D6	line diagrams (like stick-figures)	YES	NO
7D7	realistic hand-drawn pictures	YES	NO
7D8	cartoons	YES	NO
7D9	words and pictures	YES	NO
7D10	pencil	YES	NO
7D11	pen (ball-point)	YES	NO
7D12	stencils	YES	NO
7D13	koki	YES	NO
7D14	pencil crayon	YES	NO
7D15	paint	YES	NO
7D16	paper	YES	NO
7D18	cardboard	YES	NO
7D19	other (please describe)	YES	NO

Perceptions of Home

1. Name the place (and province) where you come from?	
2. Is this place a rural area?	YES NO
3. If you answered yes, say why you would define it as a rural area?	
Describe the following about the area you come from:	
4. Power (electrification) Type and quality of power	
Fuel	
Light	
5. Describe the types of housing in this area in general (construction, materials and design)	
6. Describe your house	
7. Roads	
• Type and quality of roads	
• Number of roads.	
• List the different kinds of transport, and say which is the main means of transport.	
8. Communication networks	
• within the area	
• between areas	
9. Water	
• Where is the water from?	
• Quality of the water?	
• How far is the water supply from people's homes (or is it located within the homes?)	
• General comments on water?	
10. Sanitation systems (Type and quality)	
14. Mention 2 or 3 community projects in your area.	

15. Describe some social (recreational / sport / religious) activities and political structures in your area	
16. What impression do you think outsiders have of your hometown / city / village / neighbourhood? Explain.	
17. How do you think they formed this impression?	
18. What do you most like about the place you are from?	
19. What do you like least about your hometown?	
20. Do you feel proud, ashamed or neutral about the place you come from? Why?	
21. If you had to talk about your home to this group of first year Engineering students, what would you say?	

Please check that you have answered all questions.

Thank you for your participation and co-operation

Appendix Three


Students' written reports (one report from each group):

Terms of reference

This report was written by Nobody & company group in the recognition that Nobody village is one of the villages that can be developed. The development of the village will be based on the following criteria ~~of the one that has to it.~~

- Supply safe and affordable electricity to the residents and the environment
- Supply clean and environmentally friendly electricity.
- Sources of electricity must be easily accessed and be at the reasonable price.

Nine



**SAFE AND AFFORDABLE
ELECTRICITY IN NOBODY VILLAGE**

Prepared by: *Trinity*
Communication assignment: draft one

2.

Introduction

Nobody village is facing the problems that many villages in South Africa and whole of Africa are facing. The problems are poor conditions of roads, inadequate water supply and sanitation and electricity. The residents of the village are not financially stable meaning that development must not be costly that the villagers can not cope with. This report covers the possible solution to the electricity problems. The best solution will be chosen with respect to the village's criteria for development which is to supply clean, save and affordable electricity that can withstand weather conditions. The source must also be environmentally friendly. The current electricity source in Nobody village is from Petersburg which is expensive and the majority of the villagers can not afford it.

Cover scope of report, constraints, & plan of development of report.

*Prepared by:
Communication assignment: draft one*

1.

List of Illustrations/Tables

	PAGE
Table 1.1 Electricity produced from different sources in South Africa between 1980 and 1998.....	* 9 ✓

*Prepared by:
Communication assignment: draft one*

FINDINGS

1.1 NEEDS ANALYSIS OF THE VILLAGE

The needs of Nobody village are almost similar to the needs of other villages in the country. The major needs for Nobody are **electricity, water and sanitation** and **roads**. The conditions of the roads are not good and most of the roads are gravel roads. They have a big problem with running water because water does not reach every area within the village.

1.1.1 ELECTRICITY IN NOBODY VILLAGE

Electricity is one of the major needs in Nobody village. The village is facing problems when coming to electrification.

Some parts of the village have electricity and some parts do not. The current in Nobody village is weak that during strong winds and heavy rains it breaks thus leaving the village with no lights. The weakness of current can be caused by poor power stations

People use natural resources for warming and cooking. The natural resources include cutting down trees to make fire. This may bring ^{disastrous} hilarious results to the society. The results can be domestic fires, poor health caused by the gas released when coal is burning and soil erosion because people keep on cutting trees. It is common in South Africa that almost each year children and burnt in the houses or sometimes the whole family caused by candles and paraffin lights that are being left lying around the house.

If the electricity is supplied in Nobody village things may get better and there are chances that the life as whole may be better.

Prepared by:

Communication assignment: draft one

SUGGESTED SOLUTIONS

The sources of electricity that we can use in Nobody village to produce electricity are renewable sources like wind, hydropower, and biomass energy and the non-renewable sources like coal, natural gases and nuclear.

1. RENEWABLE ENERGY SOURCES

Wind

Kinetic energy of the wind can be harnessed with turbines that are not far from the age-old windmill. They produce no air pollution beyond a negligible amount produced during occasional maintenance.

Advantages of using wind to produce electricity

- It is least expensive
- Low greenhouse gas emissions
- Low air pollution emissions
- Low water requirements
- Safe for the workers and public

Disadvantages of using wind to produce electricity

- Electricity can be generated efficiently on windy areas, this is a disadvantage to the studied village since it is not a windy area.
- Intermittent energy source
- Potentially high hazards to birds

Hydropower

Kinetic energy of flowing water can be used to spin turbines that produce electricity. There are large and small hydroelectricity plants and in this case we are going to discuss the small hydroelectricity plants because in nobody village there is a small river flowing by.

Advantages of hydroelectricity

Prepared by:

Communication assignment: draft one



6.

Advantages of producing electricity from coal

- It is cheap
- Produce electricity on-demand
- Abundant
- Low land requirements

Disadvantages of producing electricity from coal

- It's combustion produces gaseous wastes
- Requires over 7,000 gallons of water
- High greenhouse emissions
- High air pollution
- Highly hazardous occupation - *explosive fuels*

Natural gases

It was formed ages ago when buried organic matter was subjected to high temperatures and pressures. The formation still continues but it is negligible as compared to human extraction.

Advantages of using natural gases

- Relatively cheap
- Electricity can be produced on demand
- Relatively safe for workers and public

Disadvantages of using natural gases

- High green house gas emissions
- Relatively moderate air pollution emissions
- Danger of explosion if handled improperly

Nuclear

Harness the power contained within the nuclei of atoms
It is produced in large amounts in South Africa

Advantages of using nuclear

Prepared by:
Communication assignment: draft one



5.

- It generates electricity on demand
- Produces low air pollution
- Inexpensive to build and operate
- Safe for workers and public
- Low greenhouse gas emissions

Disadvantages of hydroelectricity

- Dams have devastating impacts on the ecological systems up and downstream
- Small hydroelectricity plants can not be able to provide electricity on-demand every time
- They are dependant on stream flow

Biomass energy

Biomass refers to wood, crops, harvest residues, urban refuse of methane gas produced by landfills that are burned to spin turbines and produce electricity.

Advantages of using biomass energy

- Low costs
- Low greenhouse gas emissions
- Can produce electricity on-demand
- Energy can easily be stored

Disadvantages of using biomass energy

- High air pollution
- High water and land requirements
- High occupational hazards

2. NON-RENEWABLE ELECTRICITY SOURCES

Coal

Electricity from coal is affordable for three main reasons. First, there is enough coal produced in South Africa. Second, Technology has improved production efficiency which keeps costs low. Finally, coal reserves are dispersed in South Africa which lowers transport.

Prepared by:
Communication assignment: draft one

7.

- Low greenhouse gas emissions
- Low air pollution emissions
- Can produce electricity on-demand

Disadvantages of using nuclear

- Produce dangerous radioactive wastes that are difficult to dispose of
- High water requirements
- Relatively expensive

Note, check a thorough examination of the options.

CONCLUSIONS

8.

As we have discussed the advantages and the disadvantages of the sources above factually, now we are going to scrutinize them to choose the one that is suitable to the village. We have seen that the non-renewable sources are the sources of air pollution and we want environmentally friendly sources. A single household being supplied with electricity from coal would generate over 61 pounds of SO₂ gas, 60 pounds NO_x gas, 30 pounds particulates and over 17,000 CO₂ gas. We can clearly see that although electricity from coal is cheap, it is also harmful to the public.

Electricity from coal also requires large amount of water per household and since the village does not have enough water, we can not use coal to produce electricity. Although coal is the most popular source of electricity worldwide and it is being produced in large quantities in South Africa (see table 1.1). The other non-renewable source that is not environmentally friendly is the production of electricity from nuclear power station. Recent studies by the US Nuclear Regulatory Commission (NRC) has estimated that there is 45% chance of a severe accidents occurring in the next 20 years at one of the US reactors. This is true for other reactors in the world. As a result we can not use the electricity from nuclear power stations to produce electricity because we are concerned about the residents' life.

The use of renewable sources can be used in the village to produce electricity. The problem we are facing with the renewable sources is producing electricity from wind. Nobody village is not a windy area meaning that we can not use wind as a source of electricity. Hydroelectricity plants can not supply electricity at all times because the river flow is not always at maximum. The options we have are to combine the existing method of electrification (electricity from Petersburg) and the hydroelectricity plants to scale down the price of electricity since electricity from Petersburg is expensive and the majority of the villagers can not afford and the second option we have is to mix between the two. When the river flow is at maximum, the village would be supplied with electricity from the hydroelectricity plants and when the river flow is poor, then the villagers will be supplied with electricity from Petersburg. Not all the residents can afford electricity. The cost of electricity may be a problem facing the village because electricity is not cheap. As far as I am concerned, the electricity must be supplied basing on what the family

Prepared by:
Communication assignment: draft one

Prepared by:
Communication assignment: draft one

can achieve. This can be done by the residents purchasing the electricity by using cards. ✓

TABLE 1.1 Electricity produced from different sources in South Africa between 1980 and 1998

Electricity sources	1980	1998
Hydroelectricity	1.0 %	0.7%
Coal	99.0%	92.6%
Nuclear	...	6.7%

www.worldbank.org

The table shows the amount of electricity from different sources in South Africa between 1980 and 1998. We can see that the coal has been the major source of electricity in our country and one can think that using coal to produce electricity is much better and possibly cheaper because of its abundance in our country. ✓
 The use of hydroelectricity has decreased, this could be the result of river flows. ✓
 If the company engages itself to produce electricity from hydroelectricity plants, there are chances that it can run at a loss because of stream flow. This again can be the reason why the use of hydroelectricity plants has decreased over the past years due to the above mentioned reason. We again see that the production of electricity from nuclear power stations has decreased. This is because the electricity produced is clean and can be produced in large amounts. Considering its side effects, one can correctly predict that the percentage is going to decrease. ^{increased?}

recommendations?

Prepared by:
Communication assignment: draft one

Bibliography

www.worldbank.org/data/wdi2001/pdfs (08 August 2002)
www.ewg.org/reports/choosinggreenenergy/sources.html
 (08 August 2002)

General information about Petersburg: climate and sports amenities. ✓
www.petersburg.net (11 May 2002)

Put in names of websites

Prepared by:
Communication assignment: draft one

Andrew's Written Report

Terms of Reference:

This report was established and published by Phelindaba Engineering Consultants group in August 2002. The guide lines of the ~~whole~~ research were as follows:

- ❖ The maintainance of healthy , adequate resources for people at Folweni area.
- ❖ The relation of these resources to the land infrastructure and other natural resources in the area.

specify water & sanitation criteria well

Synopsis:

Research

A.P

This report detects the new ways of upgrading the water supplying systems and sanitation systems at Folweni area. The research is made on the basis of the land deteriorating factors, and then from there the considerations are made of the new sustainable resources that can with withstand the unfavourable conditions. In the case of poor water supply , the storage tanks linked to the conveying pipes, seemed to be quite fundamental since they will match up easily with the less available space in the area. Water stored in the tanks is ensured to fulfil all the needs of the consumers in the area. For sanitation systems, the 2m-by-2m type of toilets are fundamental because they can save lot of space as well as the building material, and are said to be quite strong since they are made up of sea

75

Research criteria

IMPROVEMENT OF WATER SUPPLY AND SANITATION SYSTEMS AT FOLWENI AREA.

From: Phelindaba Engineering Consultants.

E-mail: mkhmbu001@mail.uct.ac.za

Date: 23 August 2002.

Writer:

Next

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/ Neat & clear.

Illustrations based on the project's report:
 (i) Illustrations concerning Water Systems;



Fig 1?

GIVE THE²
 CAPIONS (to
 explain the
 pictures).



Figure 3. Shows the Main Water Conveying Pipe. ✓

(ii) Illustrations concerning Sanitation Systems:

An example of the toilets that that were being used and those that are built by Sanitation System:



Figure 4. Shows the type of toilets that were used before.



Figure 5. Shows type of toilets implemented by Sanitation System (2m-by-2m type of toilets). ✓

Nice ✓

Introduction:

The provision of safe drinking water supply and sanitation facilities is a basic necessity of life and crucial ~~input~~ in achieving the goal of "Health for All". This is where this report is based, the maintenance of healthy water and sanitation facilities for people at Folweni area. The place is suffering from poor supply of water (a major resource in life) and there are also poor sanitation systems which are consequently hosting several unknown diseases.

As a response to these critical conditions, a research has been made governed by the following objectives:

- ❖ To provide Folweni area with sustainable and qualitative water supply and sanitation facilities.
- ❖ To create a litter and diseases -free zone for the existing and future generations of Folweni area by implementing proper sanitation systems.

Note: mention the contents of the research, include the development of the report.

1. Description of Folweni area:

Folweni is a small area located close to Ezimbokodweni river at Isiphingo Town, near Adams Mission. The infrastructure of the land is very inadequate for the type of the houses built there (clustered mud-built houses). It consists of slopes and many huge solid rocks, which were brought about by soil erosion and floods. This degradation of the land by water resulted in some huge furrows being formed between the houses, and which are now serving as water inlets for the water that comes from Ezimbokodweni river when it is over-loaded during heavy storms, and this might have some fatal ending. The underground-buried water pipes were extracted from the soil by the powerful water streams during degradation, and through the exposure to the soil surface, they got destructed. The place is now poorly supplied with water (lorries are used for supply) and people are not comfortable about this type of service since they have to pay for each bucket of water loaded. It's even worse when it comes to sanitation because there've never been any proper toilets built there, the ones that are existing are just enough for the users not to be seen by other people, otherwise they are the other source of litter in the area.

clear description.

Analysis and Discussion

2. Water:

2.1 Storage Tank(s):

Because of the space being limited, it has been found impossible for each house to have its own tap. This is because there will be no space to dig for the number of underground water conveying pipes, since the houses are badly clustered together. However, a couple of huge water tanks has been found to be the solution to this problem. These tanks will be located each on opposite ends at the vicinities of the land, and each one of them will be connected to the water generator that will suck water from the Ezimbokodweni river to the tank. Water will then be purified frequently in the tanks using the purifying chemicals, and also by using a catalyst (to speed-up the process of purification). From there, water will then be evenly distributed by the distributing pipes to the whole area.

2.2 Water Conveying Pipes:

2.2.1 Their arrangement in space:

The arrangement of water pipes is essential since it will determine the conditions under which water will reach the consumers. This can be clearly described as follows:

When talking about water reaching consumers under its normal conditions, we mean that water must be at its room temperature (approx. 18.5 to 20.5 degrees celcius); and the ensurity of maximum solubility of the purifying chemical reagents.

The length of the main conducting pipe (the one that conveys water from the storage tank) determines how these things can be maintained. When water leaves the tank, its temperature is higher than the normal since it has been involved in chemical reactions of purification. If we let water run through a long pipe before it's distributed, however, we can obtain the desired temperature. By the time water runs from the tank through the

pipe, its temperature keeps on decreasing. It is therefore clever to have the branched distributing pipes (the ones that convey water from the main distributing pipes to the consumers) at the far end of the main pipe (where water has already cooled). Water will then be taken from there to the taps.

2.2.2 Their Resistance to Environmental factors:

The material with which these underground-buried pipes were built, is fundamental for the conditions under which these pipes are kept (underground conditions). The following brief environmental factors are very effective and should be considered all times;

• **Humidity and Soil Temperature**: these are the most essential factors that have to be considered when dealing with resistibility of the underground pipes. The humidity together with temperature, promote the decomposition reactions of objects in the soil, which might be detrimental to the pipes if their material is not strong enough.

The durability of the pipes material is therefore an important factor since these pipes are very much expensive. When the material is much corrosive, it will be meaning that a lot of money will have to be spent on a short term capital, which consequently has a negative effect on the countries economy. A qualitative material will therefore have to be used for these types of pipes.

2.3 Taps:

There is a less space available in this area, which compels the number of the available community taps to be limited. It is also impossible for water extensions to be done for each individual house because of this space limitations. The community taps, about 15 of them will therefore be implemented next to certain groups of houses. To ensure that water is not injudiciously used, a certain number of houses around the place in which the taps are implemented, will have to be held responsible for ensuring proper water utility.

3. Sanitation:

As been mentioned earlier, Foliweni area is one of the health hazardous places in which most of the unknown diseases are developing e.g sores in children and cholera. However, it's been found on research that one

of the reasons why this is the case, might be because of the improper systems used for wastes. The most toxic wastes are the inorganic wastes, and a close look was made on this type of wastes during research e.g faeces and urine.

3.1 Avoiding Injudicious Laying of Waste:

The only way of doing this is by implementing some toilets in the area, of which it's not easy since the available space is very limited. It is therefore preferable to implement the 2m-by-2m types of toilets to each house because they take much less space and won't take a long time for the building process to come into completion.

3.2 Material to be used for toilets:

No sophisticated materials can be used because the place by itself is unfavoured by its own infrastructure, therefore it will be a waste to implement systems of expensive material that will be consequently damaged by erosion. The only fundamental method is just to dig some hole of about 6.5 - 7.5 ft deep for each toilet, so that all the waste can be kept hidden there and not exposed to the community. The toilets themselves will be built with the sea smooth rocks and the cement. This will save quite a lot because no money will be spent on buying the building blocks, the rocks are just redundant at Izimokodweni River (i.e Ezimbokodweni means at the rocks). The money will therefore be spent on buying the cements and gas shafts only. The toilet will have an upright vertical shaft that will reduce the stinking inside the toilet, by taking the smell from the deep-down, waste containing, part of the toilet to the outer atmosphere. In that way the healthy environment will be maintained.

How long does it take for a hole to get full?

After about 10-15 years the hole fills up. Another hole is then dug by its side and the connection is given from the ceramic toilet basin to the new hole. Thus the toilet room/ make-shift hay room is left untouched. At a convenient time the filled up hole is emptied since the stuff in it would have decayed into sweet smelling organic manure, repaired and reused when the new hole fills up.

Reference:

Water supply and sanitation as a problem in rural areas of South Africa:
 An investigation of water supply and sanitation for Ingogo village
 (kwaZulu Natal near Newcastle)

Terms of Reference

This report was commissioned from the Ingogo Expert for the research Environment in August 2002 of water supply , the main source of water ,the quality, purity and suffience of water for the Ingogo villagers and Sanitation scheme, if they are environmental friendly and do function properly with the limited amount of water available for the villagers.

Synopsis

Incomplete
 reserve

[Water supply and sanitation in South Africa's rural areas such as Ingogo village] The village has a high population with high unemployment rates, poor standards of living, poor education facilities . In order to prevent urbanization and rural depopulation which result in uncontrolled consequences such as crime, policing problem, unemployment, congestion and family distruptions rural areas such as this village must be improved so as to prevent the consequences stated above, the Ingogo consultants were willing to try their best and help this village. Ingogo is just beyond the Drankensberg mountains near Newcastle and has heavy summer rainfalls and berg winds which are advantageous for the construction of wind mills and wind pumps. Recommendations?

Too hard

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1. Introduction

This report discuss^s water situation of Ingogo village a rural area about fifty kilometers away from Newcastle which is a neighbouring town. It has limited water and sanitation resources. Water in this village is highly contaminated with impurities as they are no reliable purification schemes. Sanitation system^s which exists are not healthy as they cause pollution. The objective of this report is to improve[✓] the water supply and sanitation systems in this village. *Scope of Report?*

1.1.1 CONSTRAIN^S

In a very long proces^s of my research I came across many constrains^s such as the information was insufficient and misleading because it was very old and not trustworthy. The abundance of resources was also a problem because time was limited and there was lot to choose^s from. *rather mention the constraints avoid the content of the research not the process*

1.1.2 CRITERIA

Development should be demand driven and community based. Choosing the right technology is very important as many people depend on water as^s the source on life. Criteria for water supply and sanitation in Ingogo village:

1.1.2.1 CRITERIA FOR WATER SUPPLY

- Water must be close to the users
- Installed taps must be easy to use
- Low cost water technologies
- Adequate water supply ✓

1.1.2.2 CRITERIA FOR SANITATION

- Environment^{friendly} friendly
- Low cost sanitation technologies
- Easily accessible
- Can operate with the limited amount of water. ✓

2. Findings

Ingogo village is situated beyond the Drankensberg mountains about fifty kilometres away from Newcastle. ✓

2.1 GEOGRAPHIC FACTS

It is a mountaineous area with an uneven landscape. It is associated with berg winds and as a result experiences Orographic rainfalls (rain caused by the ascending of warm air). This village has heavy summer rainfalls because of high evaporating rate in summer and low winter rainfalls in winter because of low evaporating rate in winter. As a result Ingogo river is perinial (water table supply water to the river during drought). ^{this is too cryptic; expect in-fall}

Since the landscape is uneven, some of the land is non-arable. Also the distribution of the soil is not even because of the different erosion rates that occur as a results of the unevenness in this village .

2.2 SOCIAL CONSIDERATIONS

Approximately 500 people live in Ingogo village. They are ruled by a chief and are neighbouring farmers where they work. Their household income is approximately R650. Some villagers leave the village to find better jobs in cities. Most of the villagers are inadequately educated, hence they lack skills. ^{High} High violence rate because some people are bored and they end up in shebeens and because of this alcohol they end up committing violence.

2.3 WATER AND SANITATION IN INGOGO VILLAGE

2.3.1 WATER SUPPLY

Ingogo villagers depend on wells water, Ingogo river, which is not very big, and tank water which is also not pure as cholera incidents have been reported in Newcastle hospital which is a neighbouring town fifty kilometers away from Ingogo. Ingogo river (the main source of water supply) is about two kilometers away from the village, so villagers have to walk a long distance to obtain water. This dam is mainly used for irrigation schemes hence it is close to the fields which people are not allowed to enter without permission from the farmer and the route to the river passes through the fields and because of this they usually use well water which is unhealthy. *like observators*

The water they use is not pure. It contain many impurities as there are no purification schemes, they have to boil it first before usage but most of the villagers do not do that because of limited sources of energy. All the villagers mainly depend on the Ingogo river for water supply and this cause stress to the river. You find that even though the river is supplied by ground water during winter it becomes dry because the large fields are irrigated with its water and also the 500 villagers depend on its water. *very well described.*

2.3.2 SANITATION *describe with type*

The are no toilets and dumping sites for sewage disposal. Villagers still use the underground toilets which are not environmentally friendly they attract flies and they smell a lot. Lot of germs are transported by insects and this make life in this area unpleasant and people are not protected from the diseases.

2.4 OPTIONS

2.4.1 WATER SUPPLY

There are many options which can help improve the life of the Ingogo villager such as:

2.4.1.1 Boreholes this can be used to uplift the groundwater

Advantages: *less expensive than what?*
Easily installed
(Existing infrastructure) *unclear.*

Disadvantages: Are built close to each other (*+ so?*)

2.4.1.2 Wind or electricity pumps which also can be used To uplift underground water to storage dams or tanks if they were to be constructed.

Advantages: They facilitate the process of water uplift
Easily installed
They use the Existing infrastructure

Disadvantages: Air dependent *- a so?*

2.4.1.3 Storage tanks which will store the rainwater.

Advantages: capture the rain water
Cost effect *(less expensive)*

Disadvantages: water is easily contaminated

These points are all a bit cryptic (needing elaboration).

2.4.1.4 Planting more wood to prevent erosion and weathering.
 Leave some land uncultivated as for ground water availability

Advantages: less expensive

An increase in ground water

No options for sanitation discussed here

3. Conclusions

3.1 Solutions for water supply

3.1.1 construction of boreholes which will help in the uplift of ground water and this water will be transported by narrow cost effective pipes to standpipes which will distribute water to a large number of Ingogo villagers.

3.1.2 construction of windpumps will also assist in the uplift of this ground water and as a result of berg winds the process will be faster

3.1.3 Planting more wood to prevent erosion and weathering and leave uncultivated lands for the availability of groundwater.

3.2 Solutions for sanitation

3.2.1 Less expensive toilet could be constructed using narrow cheap pipes, solid waste flush constructed to sewage waste reduction tanks where underground worms will be placed and will get rid of the waste.

3.2.2 By recycling sewage waste, compost for the fertility of soil can be obtained.

3.2.3 Sewage waste channels down the steep slope of Drankensberg mountain can be constructed.

4. Recommendations

4.1 Water Supply

This village appear to have a lot of existing infrastructure Ground water is abundant and can be uplifted by placing boreholes several distance apart, construction of windmills, this is at advantage as there are winds flowing through the area and construction of wind pumps is also a good idea and not expensive. Planting more wood to prevent erosion and weathering and leave some land uncultivated for availability of groundwater. Trees planted should be diseases free (will not need to be sprayed). Standpipes which are also cost effective can be constructed. These will serve a large population and will only be a few metres away from the villagers.

4.2 Sanitation

Recycling sewage waste, most of the sewage can be recycled to compost for fertility of soil and other useful materials. Channels for waste disposal can also be constructed as the slope of Ingogo is very steep and this is advantageous and the waste will be carried down the Drankensberg mountain away from the villagers.

~~4.2~~ sup

5. Acknowledgements

The given information was provided by the neighbouring farmer and the people of Ingogo village and thanks to them the existing infrastructure was easily obtained. hasn't been done yet.

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A place called home Environmentl issues and low-cost housing, Place & date of publish. Merle Sowman and Penny Urquhart, Daye Illustration by Henry and Peter Theron

Not done yet

2/1/02

Appendix Four:

Summary of shifts in students resources across the Symbolic Object projects, written reports and rural village posters.

Category of Analysis	General Comments	Flowers /Nobody Group	Goat / Efolweni Group	Pants on Women / Ingogo Group
Coding Orientation	<p>In general, there is a shift from mixed domains of practice in the unregulated genres to more firmly delineated domains in the regulated genres.</p> <p>There are similarities in coding orientation across the texts of particular groups.</p> <p>The Symbolic Object posters tend to draw on abstraction more than the regulated genres.</p>	<p>Flowers Poster: Mixed domains of practice (symbolic and functional domains merge)</p> <p>Nobody Reports: Dialogic struggles</p> <p>Nobody Poster: Clearly defined domain of engineering practice</p>	<p>Goat poster and Efolweni Village poster: Narrative structure is realized through naturalistic coding orientation, and analytical structure is realized through abstract coding orientation.</p>	
Scientific Discourse	<p>The shift from Symbolic Object projects to rural village posters is to dominant academic discourse. It is a move from more dialogic to less dialogic texts. There is a shift from strong identification with the subject matter and the attendant personal voice in the students' Symbolic Object projects, to a more ambivalent identification and a distanced voice in the more regulated genres.</p>	<p>Flowers poster: mixes a range of personalized discourse</p> <p>Nobody Village reports: Distanced authorial voice using of technical lexis and nominalizations.</p> <p>Nobody Village poster: a distanced, objective authorial voice; namely that of an engineering town planner.</p>	<p>Goat poster: Strong identification with the cultural practice represented. There is a sense of belonging to 'our' culture.</p> <p>Efolweni Reports: The sense of belonging and identification is not strong and the authorial voice is distanced.</p> <p>Efolweni poster: Combines both personal and depersonalized language and images.</p>	<p>Pants on Women: A highly personal voice realized through both the visual and verbal modes.</p> <p>Ingogo Village poster: Depersonalized written language and images.</p>
Gender Discourse	<p>Gender discourse seems to be more of a feature of the less regulated genres. Gender demarcates the social spaces one is allowed to occupy and the roles one is able to play in the worlds of these representations.</p>	<p>Flowers poster: gender discourse features prominently (especially in the cycles of nature)</p> <p>Nobody Village reports and poster: gender is absent as an indicator</p>	<p>Goat poster: Sacred spaces are reserved for men.</p> <p>Efolweni Village poster: Domestic spaces are reserved for women.</p>	<p>Pants on Women: Gender is key in determining appropriate behaviour according to a common collective norm.</p> <p>Ingogo Village poster: Gender is removed as an indicator, but the emphasis on the collective remains.</p>
Nostalgia and Utopianism	<p>Nostalgia and utopianism are two</p>	<p>Flowers poster: A strong sense of</p>	<p>Goat poster: Represents nostalgia</p>	<p>Pants on Women: It is not nostalgic, but</p>

	inter-related aspects of a society in transition and emerge in ambivalent ways in students' texts – often as a tension between tradition and change.	utopianism, a looking forward to an impossibly positive future, as well as nostalgia (the valuing of traditional cultural practices). <i>Nobody reports:</i> Utopianism and nostalgia are largely absent. <i>Nobody posters:</i> Sense of nostalgia is prominent, backward looking to an impossibly positively remembered past.	for traditional practices. <i>Efolweni Reports:</i> The written report is neither nostalgic nor utopian, but pragmatic. <i>Efolweni Village poster:</i> Represents development as utopian and nurturing.	represents change as good and as modern. <i>Ingogo Village reports:</i> Pragmatic rather than nostalgic or utopian. <i>Ingogo Village poster:</i> Pragmatic rather than nostalgic or utopian.
Propriety	The students' texts espouse a strong sense of moralistic propriety in the unregulated genres. In the more regulated genres, the discourse of propriety is less overtly moralistic, but there is still a sense of 'appropriate' societal behaviour.	<i>Flowers poster:</i> No stable sense of propriety. The play of discourses tends to be carnivalesque. <i>Nobody Village reports and poster:</i> Propriety is largely absent.	<i>Goat poster:</i> Propriety is about ritualistic participation and takes a gendered form. <i>Efolweni Reports:</i> Propriety is largely absent. <i>Efolweni poster:</i> Propriety is realized semiotically in the representation of the children's bodies.	<i>Pants on Women:</i> There is a strong sense of propriety from both an aesthetic and a moralistic point of view. <i>Ingogo Village reports:</i> Propriety is largely absent. <i>Ingogo Village poster:</i> Assumptions of a 'norm' in ways of living.
Perspectives on Development	There does not seem to be any discernible pattern in the shifts in students' perspectives on development. Rather, perspectives on development in students' texts remain full of contradictions. On the one hand, development is seen as democratic and participatory. On the other, development is seen as outsiders 'saving' the village.			
Perspectives on Nature	There is a shift from a focus on the social in the reports to a focus on the natural in the rural village posters. In the rural development texts, development is largely constructed as taming or	<i>Flowers Poster:</i> Nature is represented as an agent, providing signs to humans. <i>Nobody Reports and Poster:</i> Nature is to be	<i>Goat Poster:</i> Nature harnessed for culture. <i>Efolweni Poster:</i> Mediating contact with nature signifies	<i>Pants on Women:</i> Nature is absent as an indicator. <i>Ingogo Poster:</i> Nature to be harnessed, but also not

	harnessing nature.	harnessed and developed.	development	disturbed too much.
Narrative Structure	The narrative structure persists across all the texts of one group.	No narrative structures.	Goat Poster: Change from one state to another Efolweni Reports: Procedural Efolweni Poster: Change from one state to another	No narrative structures
Binaries	Binaries can either fit into a narrative structure or conceptual framework. This tended to be consistent across texts within particular groups.	Flowers poster: Analytical binaries (abstract versus particular meanings of flowers). Nobody Reports and Poster: Analytical binaries (advantages versus disadvantages of technologies)	Goat Poster: Before and After narrative structure Efolweni Reports: Analytical binaries Efolweni Poster: Before and After narrative structure	Pants on Women: Analytical Binaries (the individual versus the collective) Ingogo Reports: Analytical binaries (advantages versus disadvantages of technologies) Ingogo Poster: Analytical binaries
Relation of the particular to the general	Systems of classification are important conceptual and cognitive resources for students of engineering.	Flowers poster: Classification of concepts according to the particular (personal, economic, physical meanings) and the general (cultural symbolic meanings) Nobody Reports and poster: Generalized view of technology versus contextual applied view	This conceptual framework is not a key feature of the Goat/Efolweni Village texts	Pants on Women: Participants are represented as 'types' of a generalized concept. Ingogo Poster: Participants are represented as 'types' of a generalized concept.

Appendix Five:

Symbolic Object posters