The interplay between structure and agency: How Academic Development Programme students 'make their way' through their undergraduate studies in engineering

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Declaration

I, **Disaapele Gleopadra Mogashana, Student number: STLDIS001**, declare that this thesis is based is on my own work. It is being submitted for the degree of Doctor of Philosophy in Engineering in the University of Cape Town. It has not been submitted before for any degree or examination in any other University.

Disaapele Gleopadra Mogashana DATE

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Abstract

The interplay between structure and agency: How Academic Development Programme students 'make their way' through their undergraduate studies in engineering

This study explores and seeks to explain the ways in which a group of Academic Development Programme (ADP) students 'made their way' through their studies in engineering at the University of Cape Town. Underpinned by Bhaskar's realist philosophy of social science, the study uses Margaret Archer's morphogenetic realist social theory to explore the interaction between the university (social and cultural relations) and the students (agential relations). Data was generated through a series of three interviews with each of 12 students in the fourth year of their studies and through an analysis of selected university documents.

Margaret Archer's morphogenetic approach, which allows for the temporal analytical separation of structure, culture and agency, provides methodological and analytical tools to investigate interactions between their respective emergent properties. It posits that structure and culture predate the actions of agents who transform it. As such, structural and cultural emergent properties condition the situations in which agents find themselves. Furthermore, agents' personal emergent properties, such as corporate agency and reflexivity, allow them to deliberate on their courses of actions. Key to this theoretical approach is the notion that structure and culture do not act in a deterministic way; their properties can only become powers when they are activated by agents' projects.

With regard to structure, it was found that the combination of a fragmented curriculum, a shortened examination period, and unfavourable examination timetables all served as potential constraints to students' projects. With regard to culture, it was found that the ideas of mainstream students and lecturers about ADP students exacerbated such ADP students' experiences of marginalisation and exception. Moreover, the study found that the mainly black student enrolment of the Academic Support Programme for Engineering in Cape Town (ASPECT) was experienced by students as racial prejudice. While the findings suggest that students thus found themselves in extremely constrained circumstances, they were also found to have exercised corporate agency and different modes of reflexivity to overcome some of their constraining circumstances.

Following an analytical process of retroduction, the study suggests that the ADP, although it facilitated students' entry into the university, simultaneously positioned them within a situational logic of constraining contradiction and as such exacerbated their experiences of exception. Moreover, it is argued that, although the university has made major structural changes to accommodate students from disadvantaged educational backgrounds, the ideas that shape the ADP space perpetuate the view that these students have an educational 'deficit'. In conclusion, the study suggests that higher education should reconsider the idea of separate programmes, as their inherent situational logic appears to work against some of their fundamental goals, which are to facilitate redress and to widen participation.

Table of Contents

List of Tables

List of Figures

List of Acronyms

ABQ	Alpha Baseline Questionnaire
AD	Academic Development
ADP	Academic Development Programme
ASPECT	Academic Support Programme for Engineering in Cape Town
CEP	Cultural Emergent Property
CHED	Centre for Higher Education Development
DET	Department of Education and Training
DoE	Department of Education
DP	Duly Performed
EBE	Engineering and the Built Environment
EDP	Education Development Programme
GER	Gross Enrolment Rate
HoDel	House of Delegates
HoRep	House of Representatives
IPD	Institutional Planning Department
NRF	National Research Foundation
NSFAS	National Student Financial Aid Scheme
PEP	Personal Emergent Property
SEP	Structural Emergent Property

SI	Social interaction
SS	Social structure
UCT	University of Cape Town
UKZN	University of KwaZulu-Natal
UNISA	University of South Africa
Wits	University of the Witwatersrand

Chapter 1 - Introduction

How might the tasks and achievements of being a student be understood? What kind of changes might students undergo in their educational journey? Moreover, what kind of people do they become at the end of this journey? These are some of the crucial questions that Ronald Barnett, the British philosopher of higher education, asks in his 2007 book entitled A Will to Learn. Here, he considers the phenomenon of students' persistence in higher education, suggesting that this phenomenon is generally not discussed in the literature. In other words, although there is much focus on success and failure in relation to the predictive value of students' background attributes, the possibilities for student agency and its development tend to receive far less attention. This dominant view of students characterises them mainly in terms of what Archer (1995) refers to as 'primary agency', i.e. the group agency deriving from their natal contexts. Barnett calls for the phenomenon of student persistence in higher education to be properly explored on its own terms; he states that:

> Not only does this persistence towards students' own learning last over a protracted period of time, but it is also a project that calls for considerable effort and even anxiety on their parts, and it is a project where success cannot be assured. Yet many millions of individuals do this all over the world and the majority of them succeed. Just how is it that students keep going? (Barnett, 2007, p. 3)

Barnett offers a philosophical approach to this phenomenon, in which he explores the relationships between 'will', 'being' and 'becoming', by drawing on the philosophy of Heidegger. However, he also calls for more research in this area and suggests that the phenomenon could be approached from other perspectives, such as psychology, sociology and biology.

Paul Ashwin, a British scholar at Lancaster, offers another criticism of contemporary higher education research. Ashwin (2009, p. 3) uses the term 'teaching-learning interactions' to describe 'situations in which students engage with other students, academics, or support staff in relation to the curricula of their programmes, even if they are separated by location or time'. Ashwin (2009, p. 5) argues that much of the existing teaching and learning research focuses either on academics or students and suggests that 'there is little sense of the ongoing,

dynamic interplay between academics and students within particular teaching and learning interactions'. Ashwin thus calls for research that can account for the complex, dynamic and interrelated nature of the social process of teaching and learning, a direction that is congruent with the change in focus called for by Barnett (2007).

Taking into account these calls by Barnett (2007) and Ashwin (2009), I undertook this doctoral study to explore how students in an Academic Development Programme[1] (ADP) at the University of Cape Town (UCT) persisted – or rather, 'made their way through' – to the senior years of their studies. Whereas Barnett (2007) uses the term 'persistence', this study, however, broadly employs Archer's (2007) phrase 'made their way through' instead. Working as an academic development lecturer in the Academic Support Programme for Engineering in Cape Town (ASPECT), I was a member of various committees at that time, in which matters of students' intake, progression, and success rates were discussed. I noticed with interest that the success rate of students in ASPECT was often lower than that of students in the mainstream programmes. According to UCT's Institutional Planning Department (IPD) data for ASPECT cohorts from 1995 to 2003, 51 percent of students in these cohorts graduated. The fact that almost half of the students who entered ASPECT failed to succeed sparked an interest in me to investigate why this appeared to be the case. Instead of focusing on those who had failed, however, I wanted to explore how those who 'made it' achieved their goals.

A study that considers 'how students make it' needs to investigate what is essentially a complex interaction between the students, the university environment and the broader social context in which they find themselves. Being mindful of Ashwin's critique mentioned above, and that of other scholars in this vein, a robust theoretical framework was needed to describe and explain the complexities of students' persistence in their journeys. Critical realism offered a useful philosophical foundation and the social realist theory of Margaret Archer, a British sociologist, became an appealing choice, as it provided a social theory for exploring the interaction between the students' agency and the university's social structure. In

[1] The literature often refers to Academic Development Programmes as 'foundation programmes' or 'bridging' programmes. For the purpose of this study, they will be referred to as Academic Development Programmes or ADPs.

particular, her recent project examined how higher education students engage reflexively with structure and culture under her definition of these terms (Archer, 2012).

In the context of contemporary higher education globally, and in South Africa specifically, this study thus aimed to address the broad research question:

How do students who came through an ADP make their way through to the senior years of their studies in engineering?

This question needs to be explored within the context of higher education, both globally and in South Africa. These two higher education contexts are described next.

1.1 The global higher education context

The widening of participation in higher education is a post-World War Two phenomenon that started in the USA, the UK and Europe and continues into the 21st century. In his analysis of this trend, Trow (2006) distinguishes between three systems of higher education: elite, mass and universal higher education. The elite system entails the participation of less than 15 percent of a population and is aimed at 'shaping the mind and character of the ruling class; preparation for elite roles' (p. 1). The mass system is geared towards the 'transmission of skills and preparation of a broader range of technical and economic elite roles'. The universal system, which entails the participation of more than 50 percent, according to Trow, adapts the population to 'rapid social and technological change' (p. 1). Trow's concepts remain useful in describing the surge in the numbers of students participating in higher education that took place at the turn of the 21st century.

In many respects, the widening of participation was, in its early stages, a move from elite to mass higher education in order to accommodate, for political and economic reasons, the post-World War Two population bulge into higher education (Maton, 2005). Unterhalter and Carpentier (2010) report that, in 1970, the global participation in higher education was just over 28 million; by 2006, this had further increased to just over 143 million. Although the western countries (Europe, the United Kingdom and the United States) have experienced a steady increase in participation, in developing countries this growth has been very rapid in recent years: Unterhalter and Carpentier (2010) report an increase from less than 7 million in 1970 to over 85 million in 2006. Marginson (2008) notes that the post-World War Two era

also saw an increase in the number of students who studied outside their countries of origin, with most of them travelling from developing to developed countries. Such migration has increased significantly in recent times. Between 1995 and 2004, for example, the number of students who studied outside their countries of origin more than doubled from 1.3 million to 2.7 million. The worldwide increased participation in higher education has resulted in what Reay, Crozier and Clayton (2010) termed the breakdown of 'exclusivity in university education'.

This study is thus located within the rapid global expansion in higher education from the end of the 20th century into the early 21st century. During this period, the expansion of higher education has coincided with a period of intensified globalisation (Gorard, 2008; Marginson, 2008; Scott, 2000; UNESCO, 2009). According to Marginson (2008), the distinctive global dimension of recent societal changes indicates the growing importance of national systems connecting with other external systems. Moreover, the impact of globalisation on higher education is shaped by the increasingly connected world economy, by advancement in ICT and by other factors, which are mostly driven by factors outside higher education (UNESCO, 2009). Policies of internationalisation have also been developed in higher education in response to globalisation and make it possible for 'global flows' of students and academics in higher education to take place (Marginson, 2008).

The recent growth in higher education participation in China and India, currently the largest and the third largest academic systems in the world respectively, straddling the USA, is noteworthy. With their population sizes estimated at 1.3 billion and 1.1 billion respectively, their increased participation in higher education significantly affect the global numbers (UNESCO, 2009). Altbach (2009), cited in UNESCO (2009), suggests that enrolment in China and India alone accounts for half of the global enrolment in higher education. It is estimated that China and India could reach a combined participation in higher education of 500 million by year 2025. This suggests that the growth of educated Chinese labour alone could reach four times the size of the pool from North America and 2.4 times that of Europe (Willekens, 2008).

The global expansion of higher education has, among other things, introduced challenges that arose from welcoming the 'new student', i.e. those coming from social groups who had previously not accessed higher education. Maton (2005) succinctly describes the anticipated challenges that the 'new student' was anticipated to bring to higher education in the 1960s.

He defines the 'new student' as 'the first of (usually) his family to enter university and typically of working class origin'; he extends this definition by using Fulton's (1966) comment that these students 'were portrayed as bringing 'their own problems for which universities have to find the appropriate answers'' (Maton, 2005, p. 692). However, Maton suggests that the 'new students' never quite materialised in the way that had been expected. He suggests that the establishment of 'new universities' for 'new students' was the way in which universities at that time 'refracted' the pressures from outside the field:

> Like a prism refracting light, the field refracted the focus of policy, changing the object it lighted on. What could feasibly have been a debate over social, economic and political changes couched in terms of, for example, social class and economic performance was translated into a specifically educational issue: the educational needs of students at university studies (Maton, 2005, p. 695).

As higher education continues to expand globally, and in order to address the challenges brought about by this expansion, it is important to locate South African higher education within this broad context and to highlight some of the distinct challenges it faces.

1.2 The higher education context in South Africa

Higher education in South Africa is currently experiencing challenges similar to those encountered in the global context; however, the long history of colonialism and apartheid has exacerbated what remains unequal participation across race and class (Badat, 2009; Naidoo, 2004; Rollnick, 2010). Badat (2009, p. 457) indicates that, under colonialism and apartheid, 'inequalities of class, race and gender profoundly shaped South African higher education, establishing patterns of systemic inclusion and marginalisation of particular social classes and groups'. As a result of the segregation of higher education post 1948 into institutions catering for different race groups, institutions were allocated 'different ideological, economic and social functions in relation to the reproduction of the apartheid and capitalist social order' (Badat 2009, p. 457). Badat points to data presented to the Council of Higher Education in 2004, which indicates that, after the advent of democracy in South Africa, the gross

enrolment rate (GER)[2] for the 20-24 year age group in higher education was 17 percent; moreover, this was 'highly skewed' by 'race', with approximately nine percent of black[3] Africans participating compared with 70 percent of the white population group.

Although the apartheid system ended two decades ago, its consequences are still felt to date. In general, race is still an indicator for accessibility of quality school education. As a result, schooling background continues to have a significant impact on students' participation in higher education. Scott (2009) quotes a 2007 UNESCO report, which estimated that, compared to the 20 percent benchmark for other developing countries, South Africa's GER is only 16 percent. Moreover, an analysis of the year 2000 cohort found that the GER for black Africans was at 12 percent compared to the 60 percent for whites (Scott, 2009). Although 12 percent is a slight improvement from the GER of nine percent reported at the start of democracy in the country, it indicates that South Africa is still a long way from achieving equity of access to higher education.

Moreover, although access to higher education has improved slightly, the equity of outcomes is a distant goal. Scott (2009) bleakly reports that only about five percent of young black people qualify in the programmes in which they have enrolled. Scott (2009, p. 43) laments the fact that a higher education system 'that is not able to successfully accommodate more that 5% of the majority of the population group is failing in a critical way'. Accordingly, research that seeks to grapple with the issue of how students 'make it', particularly students from disadvantaged education backgrounds, is crucial for several reasons, including: redress of injustices of the past, economic development and keeping up with the globalised world.

A key strategy of the post-apartheid state to redress unequal participation in the South African education system, recognising that students come from differential educational backgrounds, is the formalisation and funding of ADPs (DoE, 1997). It must be noted that

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[2] Gross enrolment rate (GER) is defined as the total enrolment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population, corresponding to the same level of education in a given school year (UNESCO, 2009, p. 224).

[3] In post-apartheid South Africa, the term 'black' refers inclusively to those otherwise termed Africans, Asians and coloureds. In this study 'black African' refers specifically to the blacks of African origin. The use of racial designations in this study does not presume any biological significance to these; instead it is a recognition that the legacy of apartheid continues to impact on the lives of South Africans in different ways.

ADPs in science and engineering are not new: their history can be traced back to the early 1980s; part of this history is presented in more detail in Chapter 4. The ADPs may have improved access for black students, but their current challenge is to promote 'access with success', as envisioned in the White Paper 3 on Higher Education (DoE, 1997). Based on the 2000 cohort analysis, Scott, Yeld and Hendry (2007) reported that only 32 percent of black students completed their engineering studies within five years, compared with 64 percent of white students. The implication is that ADPs in engineering, together with other interventions in higher education, face immense challenges if the success of black students in these fields is to be improved.

The focus on students in engineering is of significance, both for historical reasons of unequal participation in the field (Rollnick, 2010) and to meet the demands of the globalised 'knowledge economy', which seeks graduates with skills in scientific and technological areas (Naidoo, 2003). Considering that students who study engineering through ADPs generally come from under-resourced schools, it is important to investigate those who successfully 'made their way' into the senior years of their studies. In addition to coming from under-resourced schooling, these students usually also face the challenges experienced by what Maton (2005) refers to as 'new student' noted above. Research into student learning and success is widely documented in higher education literature. It is thus important, as a starting point, to review this body of literature briefly and to locate the object of this study within the literature. This is presented in the next section.

1.3 Review of the literature on student learning and success

The literature on student learning and success represents a significant area of focus for higher education studies in the Anglophone world, particularly in the UK and the USA. This research dates back to the 1960s and it continues to grow. Given that this field is now fairly well established, there are a number of extensive reviews and overviews that have been completed. A review over nearly four decades of work and across three key journals by Haggis (2009) argued that the field has been dominated by too narrow a set of perspectives – especially when compared to comparative developments in other areas of education research over the same period. This review resonated with some earlier concerns along the same lines noted by Webb (1997) and Malcolm and Zukas (2001).

Three dominant perspectives can be identified in the field: approaches to learning, academic literacies and student persistence. Kandlbinder's (2013) review of teaching and learning literature in four non-American journals identified the approaches to learning as one of most widely cited 'signature concepts' in the field. Ashwin (2009) also recognizes the predominance of research under the 'approaches to learning' umbrella, while also recognizing the more recent emergence of the academic literacies perspective, especially in the non-American literature. In his follow-up review of three North American higher education journals, Kandlbinder (2015) identified student persistence as one of the top five 'signature concepts' in that geographical domain.

Given that most reviews of the field to date have been relatively UK/US focused, the decision was made here rather to exemplify the field by reviewing empirical studies in South Africa, seeing as a significant body of literature in these areas has developed since the 1980s. The three perspectives noted above as dominating the field are all well represented in the South African literature, and thus this survey focuses on that body of work, as well as predominantly on studies in the fields of science and engineering, and the ADP practice.

1.3.1 Approaches to learning

The South African literature that focuses on students' approaches to learning dates back to the 1980s and aligns with the work of Marton and Saljo (1976a, 1976b) in Sweden in the 1970s, the work of Entwistle and Ramsden (1983) in the UK, and Biggs (1979) in Australia. In general, this literature examined the qualitatively different ways in which students experienced the learning environment; it thus identified the use of 'deep', 'surface' and other related approaches to learning. South African scholars have published extensively on students' perceptions of the learning environment and how these influenced their outcomes (for example, Case & Gunstone, 2003; Case & Marshall, 2004; Rollnick, Davidowitz, Keane, Bapoo & Magadla, 2008). The study by Rollnick et al. (2008), for example, developed profiles of students' approaches to learning and checked whether these could be related to students' success. Their findings suggest that the drive for academic development practitioners to encourage a deep approach to learning rather than the other approaches may not necessarily lead to student success in the remainder of the programme.

Other studies have moved beyond students' approaches to learning to consider their metacognitive development (Case & Gunstone, 2002; Davidowitz & Rollnick, 2003;

Holtman, Marshall, & Linder, 2004), which is mostly associated with the work of Flavell (1976, 1979). Case and Gunstone (2002), for example, explicitly link metacognitive development to changes in approaches to learning and argue that metacognitive development, which looks at students' ability to monitor their thought processes and reflect on their learning, can be viewed as a shift towards a deep approach. In another study, Holtman et al. (2004) found that most students shifted their approach to learning physics from memorizing and reproduction towards seeing their learning as understanding, seeing something in a different way and changing as a person. Rollnick (2010) asserts that students who are metacognitively developed are better equipped to take control of their learning, and thus stand a better chance of success.

As noted above, approaches to learning research has been criticized especially for its focus on individual cognition even though it does attempt to theorise how educational contexts interplay with student learning behaviours. A more recent approach in especially the UK and related contexts emerges from work on supporting writing but has come to offer a potentially more nuanced view on student learning which conceptualises it as the acquisition of academic literacies.

1.3.2 Academic literacies

The work on academic literacies from the New Literacy Studies in higher education (Baynham, 1995; Street, 1999) explores student learning as the development of students' identities through their acquisition of literacy practices. From this perspective, literacy is seen as a social practice embedded in context (Jacobs, 2005) and as something that is external to students. The implication for this, as suggested by Jacobs (2005, p. 477) is that academic literacies are best learned when 'embedded within the contexts of particular academic disciplines' so that students can learn to read and write and use their language and conventions.

In general, this perspective suggests that, for students to be successful in a chosen academic discourse, they need to develop new identities through developing disciplinary specific practices in reading and writing. McKenna (2010, p. 8) suggests that students may bring literacy practices to the classroom that may not be appropriate to that context and, as such, 'the overlap, or lack thereof, between these literacy practices and those expected by the

disciplinary tribe to which they are seeking membership is key to students' chances of success'.

Some studies have investigated how students acquire academic literacies in various contexts (Bharuthram & McKenna, 2012; van Schalkwyk, Bitzer, & van der Walt, 2009). The study by Bharuthram and McKenna (2012), which was conducted in an ADP, highlights some of the challenges that students experience as they learn academic literacies in their discipline. They show that students who do not have a basic proficiency in the language of instruction, which may be the case for some English second language students, find it very difficult to learn the new conventions within their discipline. Moreover, even students who are proficient in the language of instruction found it difficult to learn the rules and conventions; this they attribute to academics' difficulties in making the subconscious rules and conventions explicit to students. In a similar ADP, Van Schalkwyk et al. (2009), found that 'under-prepared' students who had been exposed to an academic literacy course as part of the programme, had to negotiate certain challenges in order to become a member of the larger academic community as well as a member of a particular discourse. They argue that a more integrated and aligned academic literacy programme may be worthwhile in that context.

A key contribution in this area is the construct of 'epistemological access', which is attributed to Morrow (1993); this broadly entails learning to become a successful participant in academic practice, with a broader focus on knowledge, including the discursive conventions of the discipline. It involves 'access to institutions of higher education and to their ways of knowing' (Boughey & Niven, 2012, p. 645). In the South African context therefore, Morrow suggests that it is not enough to grant students formal access; what is needed is to grant students access to the ways of knowledge construction that sustain the university. Boughey (2007) indicates that the facilitation of 'epistemological access' offers a coherent focus for student, staff and curriculum development for those working in the field of AD in South Africa. In particular, Boughey (2002) calls for staff developers, language specialists and subject specialists to work collaboratively in teaching students academic thinking, reading and writing and assisting them to gain 'epistemological access'.

The work on academic literacies has offered a useful focus on the micro details of access to academic knowledge and practices, but arguably still works predominantly at the level of the student and the course. Moving across the Atlantic, the work focusing on student persistence operates at a very different level of conceptualising student learning.

1.3.3 Student persistence

While the previous two perspectives are prominent in non-American higher education studies, in America, higher education research on students has largely adopted a broader focus on the social context of the university, and has often categorised this in terms of the concept of persistence. The literature in this regard includes studies that followed different theoretical and methodological approaches to those outlined in the previous two sections. Some bring together factors relating to individual student and factors relating to the university, some highlight psychological factors, whilst others highlight social factors, all of which influence students' performance, and whether they drop out or succeed in their studies.

Some studies adopted a model developed by the American scholar Vincent Tinto (1975, 1997, 2006), which brings together aspects of individual students and aspects of the university to suggest that student dropout is influenced by multiple reasons relating to both parties. For example, the model suggests that students' insufficient integration with different aspects of the university (academic and social), their separation from their home environment, their finances and their integration in the classroom all influence their success. In South Africa, the study conducted by Bitzer and Troskie-De Bruin (2004), for example, applied Tinto's model to describe factors that may contribute to students' decisions to persist with their studies, or to depart from the institution before completing their studies. Using the Alpha Baseline Questionnaire (ABQ), they found that individual factors, such as the students' perception of the academic task, coupled with their perception of their own ability and the belief that they could succeed, influence the effort they put into their studies. In terms of institutional factors, they found that better social integration into the institution might influence students' persistence; for instance, if a student is not socially integrated, they must be highly academically integrated for them to persist. The study by Breier (2010) also applied Tinto's model; their findings highlighted the effects of poverty and students' financial situations as key factors that affected students' dropout rates.

An interesting different conceptualisation, although it draws heavily on Tinto's work, is the 'circle of progression model' that was developed by Jama, Mapesela and Beylefeld (2008). In addition to aspects of Tinto's model, this model focuses specifically on what they term non-traditional students in South Africa, who are defined as 'mostly black students from disadvantaged family and school backgrounds' (Jama et al., 2008, p. 998). In their model, each of the circles of progression represents a particular stage in the progression of a non-

traditional student. The inner circle represents the student's pre-entry situation (for example, school, family, language and financial backgrounds). Subsequent circles represent factors such as university academic environment, finances while at university, the student's home background (whether rural or urban), and whether they found it difficult to adjust to an urban setting. The model emphasises the importance of taking into account the differential contexts that shape students' experiences of higher education in South Africa.

Some studies used psychological concepts to determine the factors that might influence students' success. For example, Dass-Brailsford (2005) found that high achieving students had strong initiative and motivation, were goal orientated and experienced self as having agency. In another study, Fraser, Killen and Killen (2005) found that students' levels of self-motivation and self-discipline were among the key reasons why they persisted in their academic studies. Lastly, the study by Davidowitz and Schreiber (2008) found that students' high level of intrinsic motivation and their perception of stress and workload also influenced their success.

The studies reviewed in this section have usefully started to grapple more broadly with how the individual and the environment might both impact on student progress. However, with a focus on identifying factors they tend towards a limited and somewhat atomised explanatory account. What appears to be lacking in this research is an account that shifts away from 'identifying factors' and 'deficits' towards an approach that accounts for the complex interplay between various aspects involved in student success/persistence. Haggis (2006, 2009) thus calls for a reconceptualization of the idea of 'barriers to learning' towards views that seek to understand how 'subtle aspects of higher education pedagogic culture' may make it difficult or even 'impossible' for some students to learn. Moreover, Ashwin (2009), as already mentioned above, calls for accounts that consider matters of both agency and structure, as foregrounding only one aspect of the teaching-learning interaction limits their explanatory power.

There is a growing body of research that is beginning to grapple with theoretical frameworks that account for the complexities of structure and agency in student learning research. A few such studies that took place at UCT are reviewed in the next section.

1.4 Locating the present study

A PhD study conducted by Kotta (2011), which took place in the same faculty as this study, investigated differential success rates in a chemical engineering design course, after having observed that the majority of students who failed the course were black. Using Margaret Archer's morphogenetic social theory, the study indicates the ways in which pedagogic practices, a key structural emergent property (SEP) in the department, effectively constrained a particular category of black students. Moreover, the study indicates that this group of students had limited options in mediating the SEPs, as they were unable to exercise their personal emergent properties (PEPs) in successful ways. Kotta's (2011) study is significant for the current study, as it demonstrates the complexities of the interplay between structure and agency in student learning research and offers findings to which this study adds.

In other work, Pym and Kapp (2011) present how the Education Development Programme (EDP) in the commerce faculty has managed to achieve good results. In particular, Pym and Kapp argue that the programme eschewed the 'deficit' models of viewing students; instead, they promoted 'harnessing' students' agency through various interventions, including recognising that such students would have had to exercise agency to make it to the university in the first place, considering their social backgrounds and prior experiences. Although the EDP has continued to provide a somewhat 'separate' intervention, Pym and Kapp (2011) indicate that, owing to the 'flexible' curriculum that allows students to make choices, it has made significant strides in addressing students' sense of alienation. Perhaps the first key lesson from their study is thus to recognise the conditioning influence of positioning students in a 'special' programme and how this may influence their success. Secondly, it is crucial to understand how different models of the 'extended curriculum' are employed in different faculties and whether lessons can be shared between them.

Similarly, Czerniewicz, Williams and Brown (2009) used Archer's social theory to help them explain how students 'made a plan' to access and use the internet by using their cell phones. Of particular significance was the recognition of the way in which students from low socio-economic backgrounds overcame the potential constraints of the high costs of internet to access the resources they needed in their studies.

The emergence of research that is beginning to account for the complexities of students' learning processes is important, as the questions confronting higher education are becoming

more complex. More work is needed in this area in order to build a fuller understanding of these questions, and the present study aims to fill this gap, specially through providing an in-depth account of a group of 12 students, as they 'made their way' in their studies toward a Bachelor of Engineering degree. As indicated by Case (2013, p. 3), 'as much as the central questions in higher education focus on student enrolment in programmes, student retention, progression and success, and graduate fitness for work, the actual student tends to be absent in much of this rhetoric and even in the scholarly literature'. The close-up nature of this study, with its conceptualization of student learning as emergent from a complex interplay of structure and agency, offers the possibility of significant new insights into the challenges and successes experienced by contemporary students in South Africa.

1.5 Thesis outline

The thesis is organized as follows:

Chapter 2 describes the chosen theoretical framework. The chapter begins with a description of the critical realist ontological position. This is followed by a discussion of Margaret Archer's morphogenetic social realist theory of structure, culture and agency. The relevant concepts pertaining to this study, such as, structure, culture, agency, reflexivity and situational logics are described.

Chapter 3 turns to the application of Archer's morphogenetic approach as the methodological and analytical framework used in this study; it provides the methods of data generation and analysis and concludes with some ethical considerations.

Chapter 4 describes the context of the study and gives the structural and cultural conditioning from the first stage of the morphogenetic sequence T^1.

Chapters 5-8 detail the results of the interaction stage T^2-T^3, representing students in each of the four engineering departments.

Chapter 9 provides an analysis and discussion of the key findings of this study.

Chapter 10 presents the conclusions drawn from the study, and makes recommendations for future research.

Chapter 2 - Theoretical framework

Chapter 1 introduced the central purpose of this study, which was to explore and offer an explanation for the persistence of a selected group of Academic Development Programme (ADP) students in their studies in engineering. This chapter describes the philosophical position and the theoretical framework underpinning the study.

It is important to declare the ontological and epistemological underpinnings of the study in order to provide a basis for explaining the social phenomena investigated herein. Much of the student learning research to date works within an implicit or explicit constructivist epistemology; however, there is now a growing movement in the social sciences that points out the limitations of this approach when building explanatory accounts and that argues for the value of a realist ontology (Sayer, 1992). The present study is thus underpinned by critical realism, which is a philosophical position mostly associated with the British philosopher Roy Bhaskar (1979, 1998). The key features of critical realism applicable to the study are outlined below.

2.1 Critical realism

Critical realist ontology is based on the view that objects in the world, whether natural or social in nature, exist independently of our knowledge of them. Bhaskar (1979, 1998) refers to these independently existing objects of the world as 'intransitive'. While knowledge about the objects of the world is possible, Bhaskar indicates that the knowledge itself is 'transitive' – it is historically specific, and open to change. Bhaskar thus warns against what he terms the 'epistemic fallacy', in which the intransitive dimension of the world is collapsed with the transitive. In other words, the nature of the objects of the world, he suggests, should not be conflated with the existing knowledge of them, for this knowledge is theory-laden and open to change.

Critical realism relates the transitive and the intransitive objects of the world through its notion of a *stratified* ontology comprising three domains (or strata): the empirical, the actual and the real (Bhaskar 1979, 1998). Table 2.1 summarises the stratified ontology. The domain of the empirical represents subjective experiences of objects that exist in the actual and the real domains. The domain of the actual includes the objective events that are observed, if and when the objects in the domain of the real are activated. Moreover, these events take place in

the domain of the actual, irrespective of people's experiences of them. Lastly, the domain of the real encompasses all that exists in the domain of the empirical and the actual (the transitive) and further includes underlying structures and generative mechanisms, which exist irrespective of whether they produce events. The real consists of structures and powers of objects, capacities to behave in particular ways, and the 'necessity' and 'possibility' or potential in the world (Sayer, 2000, p. 11). Sayer (2000, p. 12) summarises the implications of critical realist ontology by stating that:

> A crucial implication of this ontology is the recognition of the possibility that powers may exist unexercised, and hence that what has happened or been known to have happened does not exhaust what could happen or have happened. The nature of the real objects present at a given time constrains or enables what can happen but does not pre-determine what will happen.

Table 2.1: Critical realist stratified ontology

Nature of the object	Domain of reality	This entails
Transitive (open to change)	Empirical	Subjective experiences
Transitive (open to change)	Actual	Objective events
Intransitive (unchanging)	Real	Non-observable, generative mechanisms and structures

Another crucial feature of critical realism is the notion of *emergence*, which refers to 'the way in which particular combinations of things, processes and practices in social life frequently give rise to new emergent properties' (Carter & New, 2004, p. 6). The new emergent properties are more than the sum of the constituents and, as such, are irreducible to their properties. In a university, for example, a faculty that constitutes five departments has emergent properties that are distinct from the sum of all the properties of the five departments. The notion of emergence indicates that there is thus no linear relationship between cause and effect, and as Case (2013, p. 40) suggests, 'what we observe in the domains of the actual and the empirical cannot be simply reduced directly to the mechanism in the real'.

The implications for a researcher whose work is underpinned by critical realism are thus to go beyond the descriptions of the observed events and experiences, at the actual and

empirical strata, and to offer an explanation that seeks to uncover the underlying structures and generative mechanism, which are located in the domain of the real. Bhaskar (1998, p. 11-12) emphasises this point by stating that, regardless of the object of a study, research:

> … must be seen as a social process, whose aim is the production of the knowledge of mechanisms of the production of phenomena in nature – the intransitive objects of inquiry.

Thus this study seeks to describe the observed phenomenon of student persistence, and to provide an explanatory account for the phenomenon. Bhaskar (1998) introduces two key processes that the researcher may use, namely, abduction and retroduction. Abduction refers to a process in which the researcher uses theory to re-describe the events and experiences of the subjects of the study, while the process of retroduction goes beyond what is apparent from the events and the experiences to uncover some of the mechanisms and structures that might explain the observed phenomenon. Both concepts were employed in this study.

The object of this study is the interplay between structural and cultural conditioning, which confronts students within a leading South African research-intensive university, and the agential relations of a sample of students channelled into an ADP within an engineering faculty. The usage of the concepts of structure, culture and agency is described in the sections that follow. In realist terms, the interplay between the university's conditioning influence and the students' experiences is often referred to as the problem of 'structure' and 'agency', in other words, the problem of how to account for the causal relations and interactions between society (its institutions and dominant discourses) and individual human lives. The next section describes some prominent sociological perspectives on structure and agency.

2.2 Structure and agency

The 'structure and agency' debate, one of the prominent debates in social theorising, has commonly been conceptualised according to four prominent lines. The first tradition tends to foreground the influence of social structure over agency. Such a perspective suggests that all causal influences move from social structure to agency and that, as such, social structures are the objects of social science. Attributed to theorists such as Levi-Strauss and Parsons, this perspective suppresses the influence of human action. Archer (1995, p. 3) argues that this

perspective, which she terms 'downwards conflation', renders agency merely 'epiphenomenal'.

The second perspective, which is the opposite of the above, tends to foreground the influence of agency in explaining social phenomena (Carter and New, 2004). It is attributed to theorists such as Mead. Archer terms this perspective 'upwards conflation' and argues that it renders social structure 'passive' and 'incapable of acting back to influence individual activities' (Archer 1995, p. 4).

The third perspective, 'structuration theory', attributed to Giddens, views the explanatory primacy to be held by neither structure nor agency. This perspective suggests that 'the properties of structure and agency are only real in conjunction with each other and cannot be examined or identified separately since not even analytical separation is possible' (Carter and New, 2004, p. 4). Although this perspective is closest to hers, Archer (2010, p. 234) criticizes it for providing 'an inherently partial account of the systemic conditions of change and stability'.

According to the fourth perspective, the social realist's, structure and agency each have emergent properties and powers that are distinctively different from each other (Carter & New, 2004). Social structures are relatively enduring and possess properties and powers that can either constrain or enable. People possess properties and powers to reflect, individually or collectively, upon their social circumstances and seek to transform these. Key to the realist view is that the properties and powers of structure and agency are emergent and thus irreducible to each other. One such realist theory of structure and agency is Archer's morphogenetic approach, which is described next.

2.3 The morphogenetic approach

The key aspect of Margaret Archer's (1995) morphogenetic approach is the notion of *analytical dualism*: this means that the two strata of social reality, the 'parts', in which she distinguishes structure from culture, and the 'people', can be analytically separated over time to examine the interplay between them. Archer (1995) asserts that, although in reality structure and agency are intertwined, if they are not analytically separated, it is difficult to explain how each stratum changes over time and how they exert causal influences on each other.

With regard to the 'parts', Archer (1995) refers to *structure* as the social relations between components of a social system that involves material resources. Archer moreover refers to *culture* as 'all intelligibilia, that is to any item which has the dispositional capacity of being understood by someone' (p. 180). With regard to the 'people', she refers to *agency* as action by social agents. When referring to the 'agent', she emphasises that the term is always used in the plural; thus an agent – a collectivity sharing the same life chances – is always taken to mean a group of people rather than a single individual.

Following on the critical realist notion of emergence, the morphogenetic approach proposes that explaining social formations and changes necessitates examining the interaction between the emergent properties of the 'parts' and the 'people', namely, the structural emergent properties (SEPs), the cultural emergent properties (CEPs) and the personal emergent properties (PEPs). Each of these emergent properties is described next.

2.3.1 Structural emergent properties

According to Archer (1995, p. 177), SEPs are 'those internal and necessary relationships, which entail material resources, whether physical or human, and which generate causal powers proper to the relation itself'; moreover, they are homogeneous in nature and are irreducible to their components. Archer (1995) distinguishes between two types of SEPs: first-order emergent properties and second-order emergent properties. The first-order SEPs condition agents' *positioning* in society. They are responsible for agents' involuntary placement in society, in which they find themselves either privileged or underprivileged. As a result of their positioning, there is a differential distribution and array of roles available to them. This placement in society generally endows them with objective vested interests in either protecting their privilege or acting to change their circumstances. Thus first-order SEPs inform agents about their positioning in society and their access to differential distribution of resources.

Archer (1995) indicates that second-order SEPs, which are the results of relations between component structures, provide agents with some directional guidance about the potential courses of action available to them. Second-order SEPs present agents with particular *situational logics*; they present agents with the 'how' to interpret their circumstances before they decide to take a particular course of action. She proposes four second-order SEPs, which arise from two key statements, namely, that (i) there are necessary or contingent relations

between SEPs, and (ii) these relations are either complementary or contradictory. Table 2.2 presents a summary of these second-order SEPs and their resultant situational logics.

Table 2.2: Second-order SEPs and their situational logics (after Archer, 1995, p. 218)

Second order SEPs	Situational logic	Description
Necessary complementarities	Protection	Institutions are mutually reinforcing and work in terms of supporting each other. This creates a situation in which everyone has something to lose from disruption.
Necessary contradictions	Compromise	Two or more institutions are necessarily and internally related, yet their operations can threaten the endurance of the relationship itself.
Contingent complementarities	Opportunism	The relationship between institutions is contingent and their interests are highly compatible. Gains are to be explored from opportunities provided.
Contingent contradictions	Elimination	The relationship between institutions is contingent and their interests are contradictory. Greatest gains coincide with maximum loss from the other side. Formation of new forms of social cleavage that threaten stability.

2.3.2 Cultural emergent properties

Culture can be conceptualised in a similar manner as structure, as it supplies 'directional guidance' to agents; second-order CEPs involve the effects of *holding* ideas and beliefs that stand in logical relationships with other ideas and beliefs (Archer, 1995). The relationships are either of contradiction or complementarity. She thus posits that the second-order CEPs

endow their holders with different situational logics and 'directional guidance'. Table 2.3 summarises the four second-order CEPs and their situational logics.

Table 2.3: Second-order CEPs and their situational logics (after Archer, 1996, p. 244)

Second-order CEPs	Situational logic	Description
Concomitant complementarities	Protection	Mutually beneficial relationship and increased cultural density
Constraining contradictions	Correction	Irreconcilable differences between the ideas, either one or both of them has to adjust to operate in the same system
Contingent complementarities	Opportunism	'They objectively increase opportunity for cultural free play – for novel combinations and applications…' (Archer 1996, p. 244)
Competitive contradictions	Elimination	Opposition of ideas is a matter of socio-cultural contingency and not systemic inescapability; however, holders of such ideas eliminate some of the ideas, as they cannot be held together.

2.3.3 Personal emergent properties

With regard to the 'people', Archer (1995, p. 255) employs a stratified view of people into human person, social agent and social actor, all of whom have distinct emergent properties that are irreducible to the other. Archer (1995, p. 257) indicates further that, from the morphogenetic perspective, agents 'are agents *of* something. Baldly, they are agents of the socio-cultural system in which they are born (groups or collectives in the same position or situations) and equally they are agents of the systemic features they transform (since groups or collectivities are modified in the process)… Agents indeed are defined as *collectivities*

sharing the same life chances'. The social actor, which is employed in the singular (unlike the agent), is emergent from the social agent and entails personifying social role.

Archer (1995) distinguishes between two types of agents: corporate agents and primary agents. Corporate[4] agents are collective groups of social agents with self-defined goals and articulated reasons for strategic action in the shaping and reshaping of structure or culture. Personal emergent properties (PEPs) of corporate agents include: 'capability to articulate shared interests, organising for collective action, organising for social movements and exercising corporate influence for decision-making' (Archer, 1995, p. 258-259). Conversely, primary agents, which result from the social contexts into which people are born, are distinguished from corporate agents because of the lack of articulated say and strategic action in the modelling and remodelling of structure and culture; however, they continue to 'carry on' within their conditions and impose *aggregate* effects on culture and structure. The central aspect of Archer's conceptualisation of agency is that both primary agents and corporate agents possess PEPs that enable them to mediate the conditioning influences of the SEPs and CEPs.

2.3.4 The morphogenetic sequence

The morphogenetic sequence provides a methodological approach in which the changes in one stratum (whether structure, culture or agency) can be traced over time. Moreover, it is 'an analytical framework that can be used to analyse the histories of emergence of various social formations. It entails analytically separating structure and agency into the following sequence: '*emergence – interaction – outcome*' (Archer 1995, p. 168). Starting with the morphogenetic sequence for structure, Archer proposes that the practical application of the morphogenetic analysis rests on the following four propositions:

(i) 'there are internal and necessary relations within and between social structures (SS);
(ii) causal influences are exerted by SS on social interaction (SI);
(iii) there are causal relationships between groups and individuals at SI level;
(iv) SI elaborates upon the composition of SS by modifying current internal and necessary relationships' (Archer, 1995, p. 168).

[4] Archer's use of the term 'corporate' here has nothing to do with 'big business'.

Point (i) has already been discussed in Section 2.2 when SEPs were described. It is noteworthy that the emergent properties are not linked to the current agents but are the results of past morphogenetic cycles. Each point from (ii) to (iv) represents a step in the structural morphogenetic sequence as depicted in Figure 2.1.

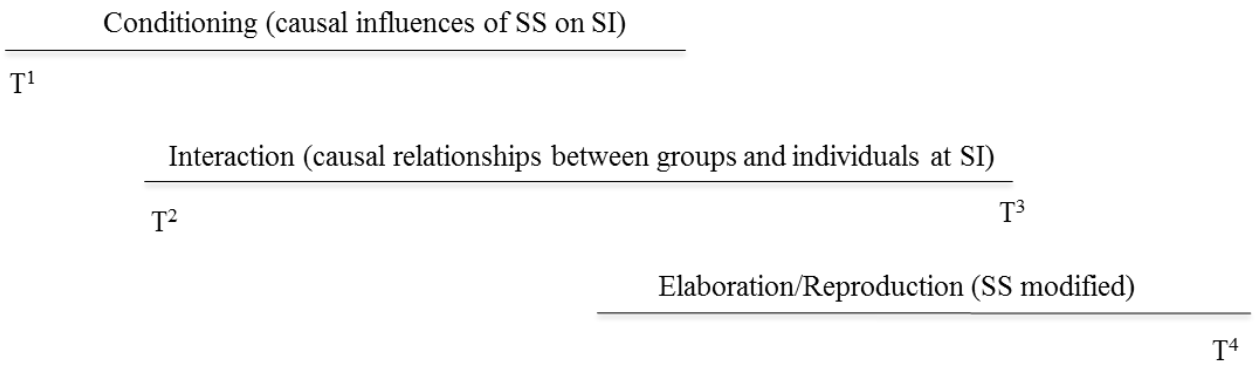

Figure 2.1: The basic morphogenetic sequence for structure

The SEPs that resulted at T^1 exert causal influences on agents at the social interaction step T^2-T^3. The last step of the sequence is the outcome of the interaction at T^4, which is either structural change (morphogenesis) or structural reproduction (morphostasis). The outcomes of the current morphogenetic cycle at T^4 mark the beginning of the next cycle.

A similar set of propositions can be made with regard to culture; however, it demands logical relationships between components of a cultural system (CS). The CEPs that resulted at T^1 exert causal influences on agents at the socio-cultural (S-C) level T^2-T^3. The results at T^4 entail either change or stagnation of culture. The morphogenetic sequence of culture is depicted in Figure 2.2.

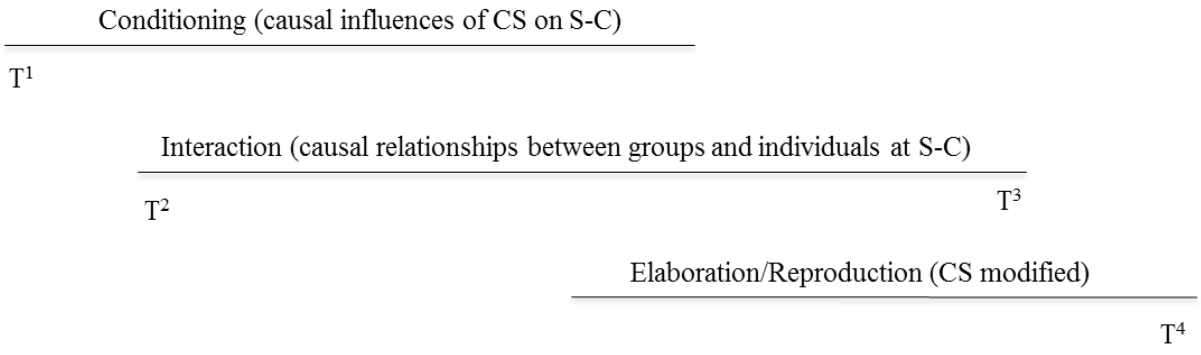

Figure 2.2: The basic morphogenetic sequence for culture

With regard to agency, Archer (1995, p. 247) indicates that agency follows the same scheme of the transformation of structure and culture; she terms this a 'double morphogenesis', noting that 'agency leads to structural and cultural elaboration, but is itself elaborated in the process'. Instead of focusing on the systemic outcomes, however, the 'double morphogenesis' thus focuses on the outcomes of agency – of group interactions. Figure 2.3 depicts the basic morphogenetic cycle for agency.

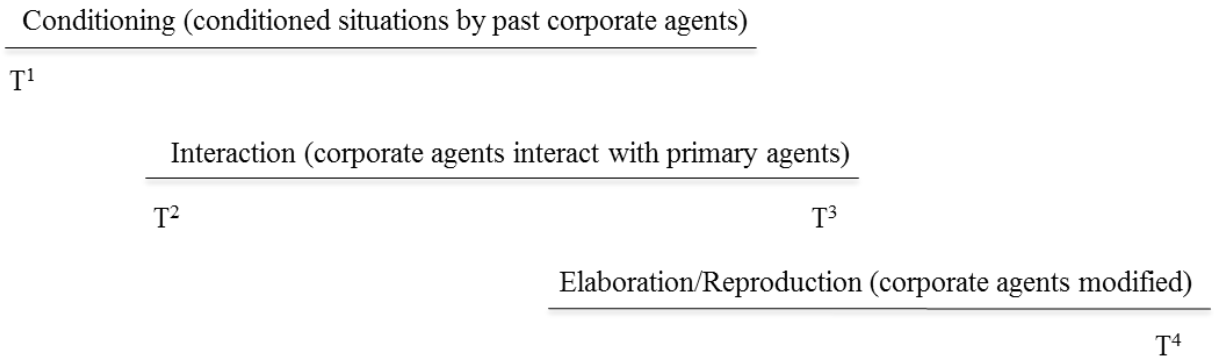

Figure 2.3: The basic morphogenetic sequence for agency

2.3.5 Reflexivity: The mediation of structure and agency

With regard to what agents do at T^2-T^3, Archer (2003) proposes that structure and agency are mediated through our internal conversation, in other words, our interior and subjective dialogue with ourselves. In particular, Archer (2007b) proposes that the agent's reflexivity is the mediator between the objective SEPs and CEPs and the agent's social action. Archer (2007a, p. 4) defines reflexivity as 'a regular exercise of the mental ability, shared by all ... people, to consider themselves in relation to their (social) contexts and vice versa'. Archer posits that reflexivity is the way in which agents mediate the effects of objective structure upon them; it 'performs this mediatory role by virtue of the fact that we deliberate about ourselves in relation to social situations that we confront, certainly fallibly, certainly incompletely and necessarily under our own descriptions…' (Archer, 2007b, p. 42). She suggests that the mediation between structure and agency raises three key questions, which cannot be answered without reference to reflexivity:

1. 'Why do people act at all? What motivates them and what are they (fallibly) trying to achieve by endorsing given courses of action? This entails an examination of their

personal *concerns* and inner reflexive deliberations about how to go about realising them.

2. How do social properties influence the courses of action that people adopt? This involves a specification of how objective structural or cultural powers are reflexively *mediated*.
3. What exactly do people do? This requires an examination of the *variability* in the actions of those similarly socially situated and the differences in their processes of reflexivity' (Archer, 2007a, p. 6).

With regard to the first question, Archer (2000) proposes that human beings inhabit three orders of reality – the natural, the practical and the social – and that they may have concerns within each of these. She defines *concerns* as 'commitments constitutive of who we are, which are an expression of our identity' (Archer, 2000, p. 4). It is through their reflexive deliberations that 'active agents' prioritise their most important concerns (their ultimate concerns) and accommodate subordinate ones, and devise a project (a concrete course of action). Through which they believe they can realise their ultimate concerns.

With regard to the last question about what people do, Archer (2007a, p. 6) suggests that this necessitates an examination of *variability* in the modes of reflexivity and proposes four ways in which people conduct their internal conversations: communicative reflexivity, autonomous reflexivity, meta-reflexivity and fractured reflexivity. Communicative reflexivity entails involving other people to complete one's internal conversation and this is often limited to the knowledge and experiences of such interlocutors in the community; as a result, communicative reflexivity tends to limit a person's choices in life and encourages social reproduction. Autonomous reflexivity involves a person who completes their internal deliberations independently, and as such, is able to pursue projects that often lead to upward mobility in society. Meta-reflexives tend to be critical of their internal conversations and to focus on their vocational ideals, and as such, they tend to be subversive to the constraints that society imposes on them; the outcome of this mode of reflexivity tends to lateral mobility. Lastly, fractured reflexivity, which Archer suggests is not a distinctive mode, involves people who are unable to hold purposeful internal conversations. Fractured reflexives tend to be passive agents who at some point may have held one of the other three modes but are presently deprived of a personal stance in society. Archer suggests that, as generative mechanisms, these modes 'have internal consequences for their practitioners and distinctive

external consequences for society' (Archer, 2007b, p. 43). The modes of reflexivity and their possible outcomes are summarised in Table 2.4.

Table 2.4: Modes of reflexivity

	Communicative	**Autonomous**	**Meta-reflexives**	**Fractured**
Ultimate concern	Inter-personal relations (The social order)	Performative achievement (Do well in the practical order)	Dedicated to a vocational ideal	Incapable of formulating ultimate concerns
Stance towards possible constraints and enablements	Evasion	Strategic	Subversive	Deprived of a personal stance towards society
Effect/outcome	Social reproduction	Upward mobility	Lateral mobility	

2.4 Theoretical research questions

Drawing together the key concepts discussed above, namely, the morphogenetic approach and analytical dualism – the fact that structure, culture and agency can be analytically separated and the interaction between their respective emergent properties studied) – the theoretical research question was formulated in this way:

How did the ASPECT students' personal emergent properties mediate the potentially constraining or enabling structural and cultural emergent properties they encountered, as they pursued their projects to reach the fourth year of their studies?

This question was divided into the following sub-questions:

1. What are the SEPs and CEPs that shape the situations in which the students find themselves while at UCT? (T^1)
2. What are the students' concerns, ultimate concerns and projects?

3. How are students mediating the structural/cultural enablements or constraints? This calls for an account of reflexivity, and corporate agency (T^2-T^3).
4. How has the interplay between SEPs, CEPs and PEPs shaped the outcomes for agency? (T^4)

The first sub-research question is addressed in Chapter 4, which looks at the structural and cultural conditioning of the social context. The second and third sub-questions are addressed in Chapters 5 to 8. Lastly, the fourth sub-question is addressed in Chapter 9. The next chapter details the research design and methodology.

Chapter 3 - Research design

In light of the theoretical framework and the research questions presented in the previous chapter, this chapter discusses the research design and the methods utilised. The study is underpinned by a case study research design and employs the morphogenetic approach as a methodological and analytical tool. The case study research design is described in Section 3.1; this is followed by a description of the context of the study in Section 3.2, and an introduction to the participants in Section 3.3. Following the morphogenetic approach, Section 3.4 addresses the methods of data generation and analysis. Ethical considerations are presented in Section 3.5.

3.1 Case study research design

The case study research design is one of the preferred designs for developing an in-depth analysis of a social phenomenon (Flyvbjerg, 2001; Yin, 2003). Yin (2003, p. 1) indicates that 'case studies are the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context'. Moreover, Yin suggests that the 'how' and 'why' questions address operational linkages that need to be traced over time. Owing to the nature of the research question herein, namely, 'how students mediate potential[5] constraints and enablements while pursuing their projects', the case study approach was thus selected as the most suitable research design. The analysis of selected cases is intended to provide a deeper theoretical explanation of a social phenomenon of student persistence (Yin, 2003). An advantage of a case study research design is that multiple data sources, such as interviews, document analysis, observation and physical artefacts can be utilised (Robson, 2002). This study used two of these data generation methods: student interviews and an analysis of selected university documents (see Section 3.4 for a detailed discussion of each method).

Notwithstanding the abovementioned positive aspects of the case study research design, it has been criticised for, among other issues, being biased towards verification of the researcher's preconceived ideas and for lacking a basis for generalisation. Flyvbjerg (2001) addresses

[5] These remain 'potential' as they depend on a student's project.

these criticisms by arguing that case studies contain no greater bias towards verification than any other method of enquiry and that, contrary to this belief, they may in fact have a greater bias towards the breakdown of preconceived ideas. Furthermore, Yin (2003) counters the criticism of the lack of basis for generalisation by indicating that case studies are indeed generalizable to theoretical propositions, even if they are not statistical generalisations, and that the former are no less valid than the latter.

Significantly, case study design rests on the arguments put forward some time ago by Lincoln and Guba (1985) in the context of what they termed 'naturalistic inquiry'. Research in this mode departs from the classic positivist tenets, and thus they propose that the traditional measures to ensure rigour in research, such as reliability and validity, need to be reconceptualised. They make similar arguments as noted above for the limitations of generalisability and argue instead for the notion of 'transferability' where sufficient detail is provided of the case so that the reader can determine the appropriateness of its findings for their context. Instead of internal validity and reliability, Lincoln and Guba introduce a set of ideas around the notion of the credibility and dependability of the research which all rests on the quality of the research process – multiple data sources, careful record keeping and prolonged engagement, such as used in the present study, being key.

3.2 The context of the study

The study was conducted in the ASPECT programme, which straddles two faculties within UCT, namely the Centre for Higher Education Development (CHED) and the faculty of Engineering and the Built Environment (EBE). As one of the ADPs, ASPECT is administered within CHED. In practice, ASPECT is located in the EBE faculty and provides access and support to students who are primarily identified as coming from disadvantaged schooling backgrounds. The students are then gradually integrated incorporated into the four engineering programmes: chemical, civil, electrical and mechanical. Figure 3.1 illustrates how ASPECT is positioned in the two faculties and in relation to other departments in CHED and EBE.

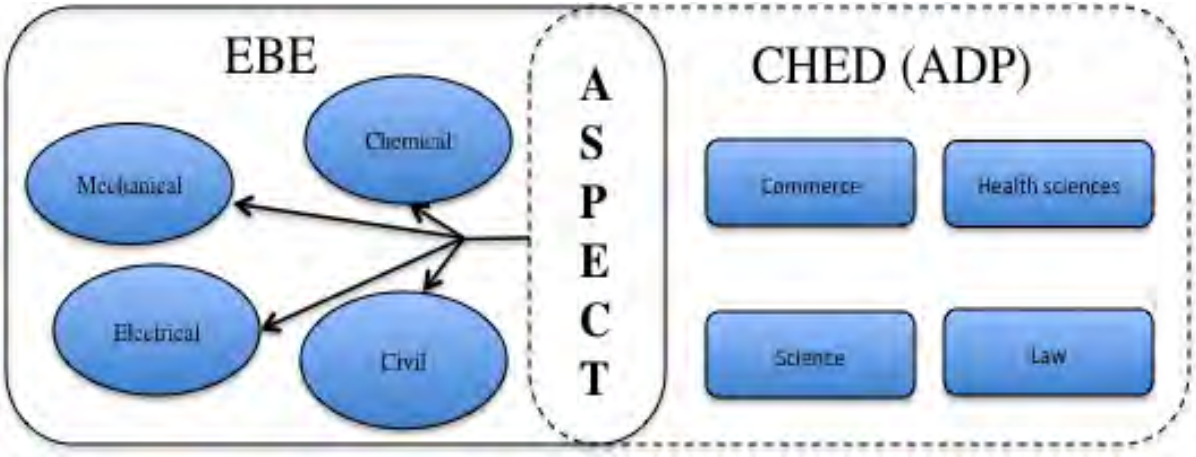

Figure 3.1: The positioning of ASPECT between EBE and CHED

ASPECT students come from varying school backgrounds that were, during late apartheid prior to 1994, classified as the (i) Department of Education and Training (DET) for Africans, (ii) House of Representatives (HoRep) for coloureds[6], (iii) House of Delegates (HoDel) for Indians, and (iv) the former white public schools (Model C). The commonality among ASPECT students in this study was that they (i) did not meet the minimum entry requirements for mainstream programmes, and (ii) came from previously marginalised population groups, all of which are currently classified as 'black'.

The racial composition of the black students in ASPECT varied from year to year; however, typically a large percentage of such students are African. The coloured group usually accounts for most of the remaining percentage. The gender percentages also vary from year to year. The average age of entrants is 18 years. A brief history of ASPECT's positioning in the faculty, and its role as a social structure that facilitate access and provides support is detailed in Chapter 4.

[6] The term coloured signifies a specific race group within the 'black' racial group. It signifies descendants of mixed races and Malay people. In the new South African they are referred to as 'black'.

3.3 The participants

The participants were selected from the 2008 cohort and the interviews conducted in 2011 when they were in the fourth year of the five-year curriculum. At the time of the study, the number of students in the cohort had decreased from the 81 who entered the programme in 2008 to 43 who were still in the programme in 2011. Students in the fourth year of their studies were selected for practical reasons; while students in the fifth year had a greater chance of completing their studies than did students in the fourth year, it was considered unfavourable and impractical to conduct research with them because they would tend to be heavily occupied with preparations to complete their studies.

To identify the participants, an email was sent to all 43 remaining students in the 2008 cohort; 15 of them responded and volunteered to participate. The final number of those who consented and participated in the study was 12. As depicted in Figure 3.2, three students represented each of the four engineering disciplines and, as such, the departmental groupings formed the basis for how data is presented in Chapters 5 to 8.

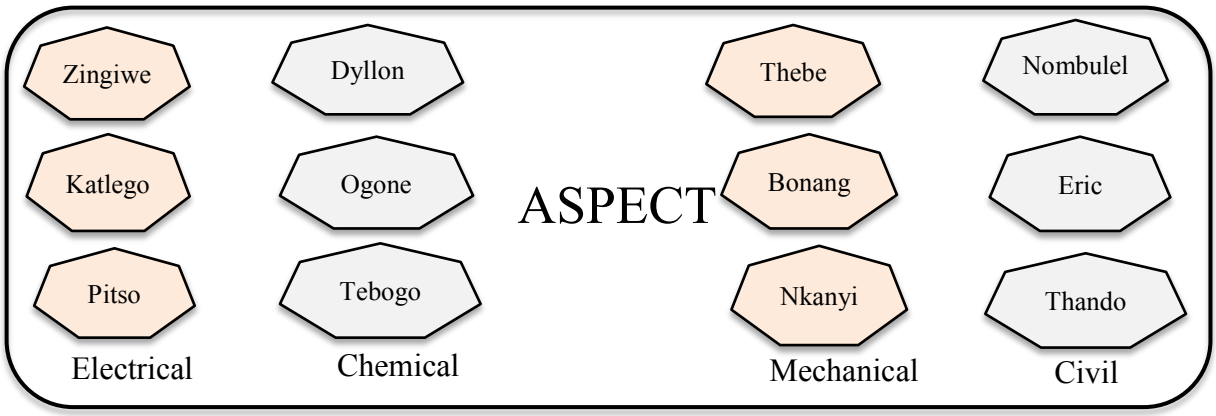

Figure 3.2: The multiple case studies within the ASPECT case

Of the 12 students, eight are male and 11 are blacks of African descent. Half of them came from schools previously classified as DET, all of which were located in the townships. Table 3.1 summarises the basic information that describes the participants.

Table 3.1: Basic information about the participants

Pseudonym	Gender	Race	Previous school authority	Discipline
Dyllon	Male	Coloured	HoReps – coloured school	Chemical
Ogone	Male	African	DET – township school	Chemical
Tebogo	Male	African	Model C	Chemical
Eric	Male	African*	HoReps – coloured school	Civil
Nombulelo	Female	African	Model C	Civil
Thando	Male	African	DET – township school	Civil
Katlego	Female	African	DET – township school	Electrical
Pitso	Male	African	DET – township school	Electrical
Zingiwe	Female	African	DET – township school	Electrical
Bonang	Male	African**	Model C	Mechanical
Nkanyi	Female	African	HoDels – Indian school	Mechanical
Thebe	Male	African	DET – township school	Mechanical

*Non-South African **non-South African but permanent resident

3.4 Data generation and analysis

As noted in section 1.4, this study locates itself within an emerging tradition of close-up sociologically informed student learning research, particularly that working within a theoretical framing resting on the work of Margaret Archer. Methodologically this required an accounting not only of student narratives, but the possibility of an analysis which locates these within a structural and cultural context – thus lending itself broadly to a study drawing on student interviews and analysis of curriculum and institutional documentation. Crucially, in Archer's framing, temporality is key, and thus the data was conceptualised in the terms of Archer's morphogenetic methodological approach. Data generation methods were applied to specific stages of the sequence, denoted as T^1 and T^2-T^3 in the previous chapter. Whilst an analysis of selected documents was the preferred method to establish the SEPs and CEPs at T^1, student interviews were the preferred method to establish the details of the mediating process at T^2-T^3. Table 3.2 illustrates how each research question was incorporated in the T^1-T^4 stages.

Table 3.2: The research questions using the morphogenetic methodological approach

RQ no	**Research Question**	**Stage of morphogenetic sequence**	**Type of data**	**Process**
1	What are the structural and cultural emergent properties that shape the situations in which the students find themselves while at UCT?	T^1	Document analysis	Abduction
2	What are the students' concerns, ultimate concerns and projects?	T^2-T^3	Interview data	Abduction
3	How are students mediating the structural/cultural enablements or constraints?	T^2-T^3	Interview data	Abduction
4	How has the interplay between structural/cultural and personal emergent properties shaped the outcomes for agency?	T^4		Retroduction (based on above analyses)

3.4.1 Document selection and analysis

Applying the morphogenetic approach suggests that, when students arrived at the university in 2008 at T^1, the structural and cultural conditions in which they found themselves were the results of historical events. Accordingly, in order to analyse the events that had resulted in the conditions at T^1, it was necessary to select and analyse the relevant historical documents. In addition to the published literature about these events, some archived documents, mission statements, faculty handbooks and review reports were selected.

It was important to establish, firstly, how the extended curriculum, a SEP that shaped students' positioning, had emerged from historical events. Secondly, selected archived documents were analysed to establish how and why some structural changes, such as the

reduction of the consolidation and examination periods, had been made. Thirdly, the university's mission statements were analysed to identify the emergent CEPS - the ideas of how the universities had evolved in the time prior to T^1. Furthermore, documents such as review reports were analysed to establish the recorded information, such as admission numbers, success rates and exclusion rates of the ASPECT programme. All these documents were analysed in order to provide a structural and cultural backdrop to ASPECT that resulted in what students encountered when they arrived at T^1.

3.4.2 Interview data generation

The central purpose of the study was to explore how students' PEPs mediated the conditioning effects of SEPs and CEPs at T^2-T^3; this called for an investigation of students' reflexive deliberations, which are exercised through the internal conversation. Archer (2003) suggests that the only way in which one can tap into a person's internal conversation is through prolonged interviews, and thus interviews were the preferred method of investigation for tracing T^2-T^3.

Archer (2003, p. 154) acknowledges that exploring the internal conversations entails encountering a 'double hermeneutic' – it entails interpreting the subject's interpretation. She adds that this 'double hermeneutic' is unavoidable and that it should not limit an 'imperfectly successful' account of durable practices. To explore their internal conversations, therefore, three semi-structured interviews were conducted with each participant during the second semester of the fourth year. On average, each interview lasted for one hour. The interview schedule is presented in Appendix 1.

The first interview involved getting to know the participant, to establish their background and to lay a foundation for subsequent interviews. The participant was guided to talk about his or her family, community and high school background. They were encouraged to talk about their personal journeys from when they decided to study at university until when they arrived at UCT. The participants mostly shared their information liberally and this helped pave the way to more in-depth conversations in subsequent interviews. Each interview was summarised within a day after it was conducted; this allowed me to develop an initial assessment of each narrative. Furthermore, the first interview with each participant was transcribed before the second interview was conducted, which enabled me to clarify and add missing information.

The second interview explored the participants' process of mediating the constraints and enablements in light of their concerns and projects. They were encouraged to talk about what they believed was most important to them, and they were encouraged to talk about their plans to achieve their goals. They were then invited to talk about each of their academic years, starting with what they regarded as their most challenging year. They were encouraged to share their challenges and opportunities and to reflect on their experiences. They were encouraged to elaborate on their decision-making processes and how they came to act in particular ways. The end of the second interview marked the end of their four-year journey. Thereafter, each interview was transcribed in preparation for the third interview.

The third interview entailed in-depth conversations about matters that required more detail than did the previous interviews; it also served as a way of verifying some of the information that had been unclear. The third interview was conducted after the participants' year-end examinations; it thus also served as a reflection on their journey up to that point. Elucidate

3.4.3 Interview data analysis

Following the process of abduction, I described each participant's family, schooling and the community background to elucidate their positioning in society and their access to resources; this helped me account for the emergence of their primary agency. Then, using the Archerian theoretical concepts defined and discussed in Chapter 2, namely, 'concerns', 'ultimate concerns', 'projects', I described the emergence of their personal identities. Lastly, I used Archer's concepts of 'internal conversation', 'reflexivity', 'constraints' and 'enablements' to describe the participants' deliberations in relation to the SEPs and CEPs. For the purpose of this study, the modes of reflexivity were re-contextualised as follows: communicative reflexivity involves participants whose stance towards institutional constraints was 'evasion'; they tended to avoid institutional constraints because they believed that they could not influence the outcomes on their own. Autonomous reflexives were those who took a strategic stance towards institutional constraints and did whatever was required to overcome the conditioning influences of structure and culture. Meta-reflexives referred to participants who took a subversive stance towards institutional constraints to pursue their 'ideals'. Lastly, fractured reflexives were the participants who lacked a personal stance as a result of experiencing institutional constraints to a point where they were uncertain about their futures. Although the process of abduction was guided by Archer's theoretical propositions, this did not imply that findings that did not fit the theoretical concepts were sidelined. Instead, the

process of managing the data, as put forward by Miles and Huberman (1994), guided how I handled the data generated.

Miles and Huberman (1994) suggest three steps of analysing interview data: data reduction, data display, and conclusion/verification. Thus, in addition to Archer's theoretical concepts, the steps suggested by Miles and Huberman also informed the process. Figure 3.3 summarises the process that was followed.

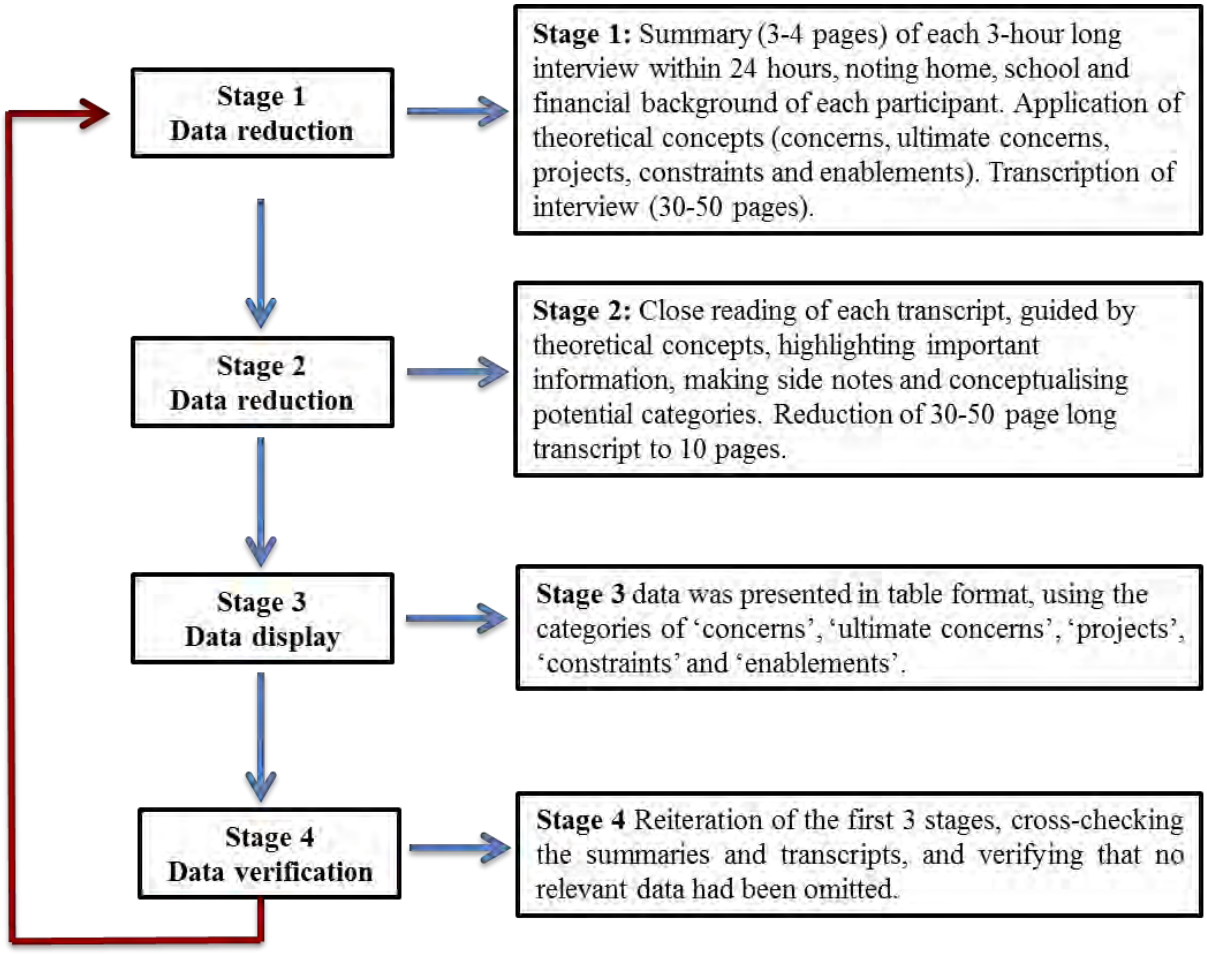

Figure 3.3: The four-stage process used to analyse interview data

Miles and Huberman (1994) indicate that the process of data reduction does not start only once data is generated; it is already inherent in the research process, when decisions are made with regard to the research questions, the theoretical framework and the methods to be used. Furthermore, they suggest that data reduction continues when data in the form of notes/transcriptions are transformed through the process of selection, focusing, simplification,

and abstraction. Data reduction moreover continues through other processes, such as writing summaries, coding, teasing out themes and making memos. While the process of data reduction allowed me to reduce the information from the transcripts, the display of this data allowed me to collect various pieces of information and present it in various predefined categories that were guided by the theoretical concepts. Thereafter, data verification entailed reviewing and re-visiting the transcripts to verify that I had not misrepresented the data.

Based on the central purpose of this study, namely, to explore how students' PEPs mediate the conditioning effects of SEPs and CEPs, the analyses worked up to the final stage of the morphogenetic cycle at T^4. Through a process of retroduction, the analyses addressed how the interplay between SEPs, CEPs and PEPs shaped the outcomes for agency and, as such, completed the morphogenetic cycle.

3.5 Ethics considerations and researcher positioning

The ethics procedures underpinning this study were approved by the relevant institutional body and are summarised here: Once the students had volunteered to participate, I sent them emails informing them about the details of the study and asked them to give an informed consent for their participation; they gave consent through email. The issues of anonymity and pseudonyms were discussed at the start of the first interview. Students were offered an opportunity to choose their pseudonyms; some did use this option, while others left the decision to me. All students who agreed to partake in the study participated until the end; thus at no point did they indicate the need to withdraw. Whilst academic staff were not part of this study, some students chose to share information with regard to their experiences with lecturers. As such, I was faced with a complex ethical dilemma that comes with researching a familiar context, what Williams (2009) terms "guilty knowledge", as some of the information that students shared with me was potentially incriminating. To protect their identities therefore, it was important to give pseudonyms to all lecturers whose names were mentioned.

A further criticism regarding case study research strategy that Robson (2002) highlights – particularly in relation to methods that involve the 'researcher-as-instrument' – is that the quality of the research is determined by the skills and the personal qualities of the investigator. In addition to having these qualities, suggests Robson (2002), the researcher must reflect on and identify areas of potential researcher bias. It was thus important that I recognise my position in the study, both as a former student and as a lecturer in the ASPECT

context. Having undergone similar experiences of being an ASPECT student, it was unavoidable that some of the participants' experiences would awaken some memories of my own similar experiences; this could introduce unwanted bias. As result, it was important for me to remain at a necessary distance and not to impose my prior experiences on the data. Although I had not taught the 2008 cohort, I acknowledge that my position as a lecturer and as the academic mentor in the department might have influenced their openness towards the study, and they might have hoped to use the interviews as an opportunity to seek counselling. However, my decision to take leave from the context prior to data collection did, hopefully, help me and the students reduce the potential bias.

This chapter presented the case study research design and morphogenetic methodological approach that were utilized to tackle the research questions. The next chapter, the first of the five analysis chapters, presents an analytical history of the emergence of the structural and cultural properties that students encountered at T^1.

Chapter 4 - Structural and cultural conditioning

This chapter analyses the emergence of the CEPs and SEPs that conditioned the situations for students at T[1]; these resulted from past events and are the elaboration of past morphogenetic cycles. Two ideational systems are considered in the analysis, namely, the post-apartheid Department of Education (DoE[7]) and the propositional register of UCT. The result of the relations between the ideas within the DoE's propositional register, and the resulting material resources, influenced the ideational and structural landscapes of higher education in South Africa and consequently influenced the cultural and structural shifts that occurred at UCT. Figure 4.1 summarises the major influences of the SEPs and CEPs at the national and institutional level to be discussed in this chapter.

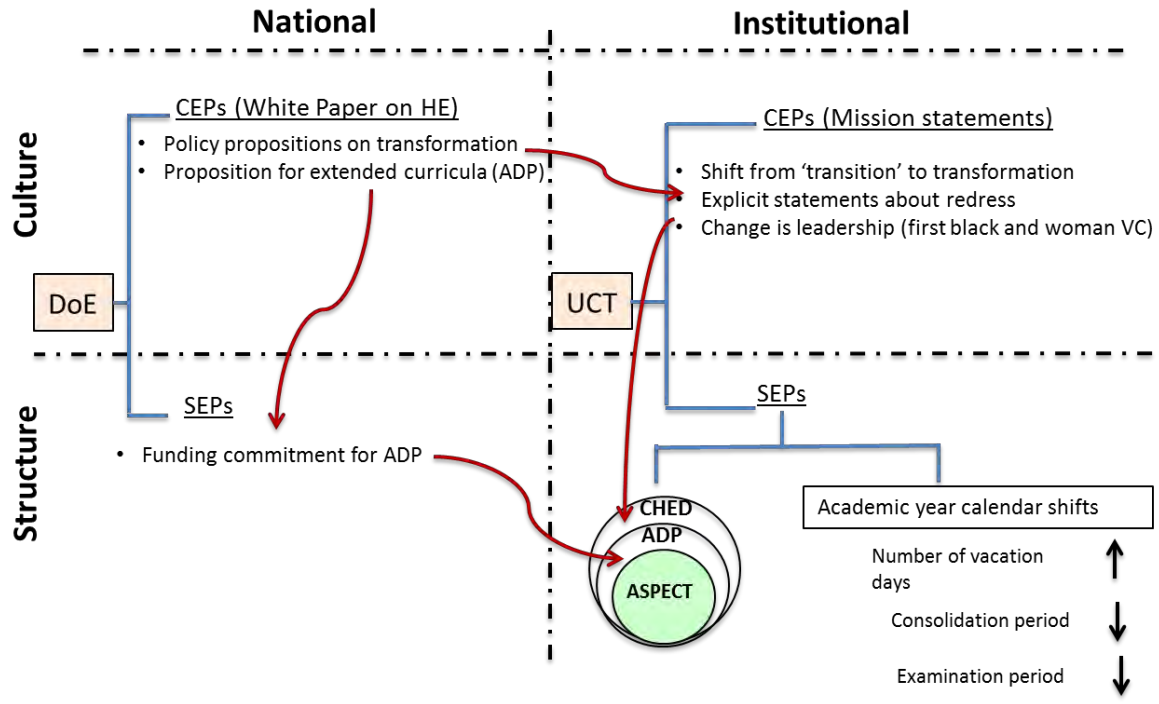

Figure 4.1: Summary of the cultural and structural situations that shaped T[1]

[7] The Department of Education (DoE) was divided into the Department of Basic Education and the Department of Higher Education and Training in 2009. For the purpose of this study, the acronym DoE is used to refer to both.

Section 4.1 addresses the cultural and structural landscape of higher education established by the DoE at T^1; it considers policy propositions with regard to redress and equity, and how these manifested as funding policy for AD. Section 4.2 then describes the cultural and structural landscape at UCT from the dawn of democracy and how it was adjusted in light of the national transformation agenda. Thereafter, Section 4.3 presents the establishment of AD as a significant structural shift at UCT, with the ASPECT programme, the ADP that concerns this study, being described in detail. It is argued that the CEPs of the DoE and UCT, together with their structural manifestations and how these influenced each other, created the conditions in which students found themselves at T^1.

4.1 Cultural and structural landscape of HE established by DoE

The DoE, having inherited the legacy of colonialism and apartheid, in the early days of the new democracy, faced the challenge of building a new and equitable education system. New policy formulations for higher education were already underway prior to the formal end of apartheid through the work of the National Commission of Higher Education (Kloot, 2011). For the purposes of establishing the CEPs that are relevant for this study, the focus is on the White Paper on higher education, which contains the first comprehensive policy position of the post-apartheid DoE (DoE, 1997).

As a CEP of the DoE, the White Paper presents key ideas and propositions for a transformed higher education system. It represents the ideals formulated for higher education and its role in transformation as follows:

> Higher education plays a central role in the social, cultural and economic development of modern societies. In South Africa today, the challenge is to redress past inequalities and to transform the higher education system to serve a new social order, to meet pressing national needs, and to respond to new realities and opportunities. It must lay the foundations for the development of a learning society, which can stimulate, direct and mobilise the creative intellectual energies of all the people towards meeting the challenge of reconstruction and development (DoE 1997, p. 7, emphasis added).

The DoE envisaged higher education playing an important role in the 'redress of past inequalities' and in meeting 'pressing national [economic development] needs'. With regard

to ‘redress’, the DoE proposed that the higher education institutions address this through:

> …increased and broadened participation…. It must increase access for black, women, disabled and mature students, and generate new curricula and flexible models of learning and teaching, including modes of delivery, to accommodate a larger and more diverse student population (DoE 1997, p. 10, emphasis added).

The DoE recognised that it might be challenging to implement increased and broadened participation; notably, the DoE was cognisant of the fact that increased participation in higher education would entail, in part, addressing the needs of educationally disadvantaged students. In particular, the White Paper states that ‘the learning deficits are so widespread that systemic changes in higher education programmes (pedagogy, curriculum and the structure of degrees and diplomas) will continue to be needed’ (DoE, 1997, p. 22).

The establishment of ADPs was a structural manifestation of the DoE’s propositions for ways to address ‘the learning deficits’ of educationally disadvantaged students at universities. ADPs were required to ‘promote the development of teaching skills, curricula, courseware and student support services…’ (DoE, 1997, p. 23). The earmarked funding for ADP, a material resource, was probably the most significant commitment to the AD project; the DoE recognized ‘the considerable cost differentials involved in teaching students from inadequate educational backgrounds and teaching students from advantaged backgrounds’ (DoE, 1997, p. 49) and as such, ADP should be added to the funding formula:

> 2.34 The Ministry will ensure that the new funding formula for higher education responds to such needs for academic development programmed [sic] including, where necessary, extended curricula. Such programmed [sic] will be given due weight and status as integral elements of a higher education system committed to redress and to improving the quality of learning and teaching (DoE, 1997, p. 23).

The change in legislation expressed through the White Paper, and the commitment of the DoE to fund the AD project, was a significant enabler on the ground, particularly because, as Kloot, Case and Marshall (2008) note, the ADPs that existed during apartheid era were ‘soft’ funded by industry. Thus, the new funding commitment enabled the higher education

institutions to do more AD work. The DoE's (2006) 'Funding for Foundational Provision' document states that, in order for a higher education institution to qualify for the funding, part of the criteria entailed:

> 4.3 …the institution regulations must specify that the curriculum of an extended programme is longer than the minimum time set for the relevant regular curriculum. The duration of the extension of the curriculum must be at least 0.5 and not more than one academic year (DoE, 2006, p. 5).

Other conditions that ADPs needed to meet to qualify for the funding included the provision of 'set learning activities, which are designed to enable students from disadvantaged educational backgrounds to perform successfully in their chosen fields of study' (DoE, 2006, p. 6).

The availability of funding meant that ADPs could be established at many universities, including at UCT. However, it is noteworthy here that ADPs were not new; these structures already existed at institutions such as UCT and Wits. Moreover, since they seemed to embody the principles of redress and equity, the DoE embraced their principles as a tool for redress. In this regard, Kloot (2011, p. 81) argues that ADPs were 'somewhat of an anomaly compared to the overall focus of post-1990 policy project'; he argues that the objective of the post-1990 programme was to 'break with the apartheid past and realise a single co-ordinated higher education system'. Nevertheless, both the legislation of the DoE and the subsequent funding commitment shaped the higher education landscape and the projects that could be pursued. The cultural and structural shifts that had already begun at UCT in light of these legislative changes are described below.

4.2 Cultural and structural landscape at UCT

UCT was established in the colonial era and had, during the apartheid years, wrestled with the policies of separate education for different racial group. Specifically, UCT wanted to retain its institutional autonomy and to decide whom it could teach (Kloot, 2011). To describe the cultural and structural landscape at UCT and how it adjusted to the new South Africa, the section that follows describes the ideas and propositions that shaped the transformation of the student body at UCT prior to the end of apartheid and how the pace of transformation shifted under the new policies of the DoE.

4.2.1 The ideas and propositions at UCT

Transformation in the student body at UCT started even before the end of apartheid and can be traced back to the early 1980s. In that period, the apartheid legislation 'softened', thus enabling the admission of a small number of black students at elite universities. In a report that reviewed transformation at UCT, Nuttall (1999, p. 2) indicates that, under the leadership of Dr Stuart Saunders, 'the emphasis of change was essentially on creating ways for students of colour to gain admission to UCT'. Thus under his leadership, UCT 'stretched the limits of the apartheid legislation' (Luckett, 2012, p. 343) and admitted a small number of black students. In 1984, black students made up 17 percent of the student population and by 1994 the percentage had increased to 52 percent. For African students, in particular, the percentage grew from three percent to 31 percent (Nuttall, 1999).

By the early 1990s, UCT was already grappling with the increased diversity in its student population. Ifill (2000, p. 241) indicates that the implications of this were 'far-reaching for the conduct of the University. It was already a concern, not least to the students, that the diversity of the student body did not translate into diversity in the composition of the staff'. UCT's mission statement in 1994, at the dawn of democracy, expresses its position on racial discrimination, a view that it had expressed similarly, to some extent, throughout the apartheid period:

> The University of Cape Town rejects racism and racial segregation and strives to maintain a strong tradition of non-discrimination with regard to race, and with regard to religion and gender, in the constitution of its student body, in the selection or promotion of its faculty and in its administration. The University hopes to create an environment where inquiry and scholarship can flourish, where heterodoxy is not suppressed and where creativity can find expression. Its goal is excellence in all the facets of university life: teaching, research, administration and the interface with the community (UCT, 1994).

Furthermore, UCT recognised the need to provide support for students from disadvantaged backgrounds; specifically, the 'highest standards of teaching' would allow UCT:

> to ensure that students from disadvantaged backgrounds are given special teaching assistance if needed after admission to UCT to ensure that they can succeed and meet the high degree standards UCT demands (UCT, 1994).

When apartheid ended in 1994, it was imperative that UCT shift gears from what Ifill (2000) refers to as the 'transition' – a period in which UCT controlled the pace at which change was taking place – to transformation, a period in which the state controlled the pace. The necessity for transformation implied that UCT could no longer 'rest on its history of liberal reform, [as] it was now in the throes of transformation…' (Ifill, 2000, p. 242). The seeming lack of control of the pace of change created discomfort among some UCT staff; as Ifill (2000, p. 242) suggests, there was a 'growing concern that the rhetoric of transformation leaped far ahead of its reality'. Perhaps this 'growing concern' came in light of the realization that the ideas that had shaped UCT until then might potentially need to change in order to align the university with the government-guided transformation agenda.

The appointment of Dr Mamphela Ramphele as the first black female vice chancellor at UCT between 1996 and 1999 was possibly the biggest ideational shift at UCT. Nuttall describes her role as follows:

> It was to be her destiny to build momentum of transformation at UCT… to take the University by the scruff of the neck and shake its 167-year-old bones in a series of dramatic – but strategically immaculate – change initiatives (Nuttall 1999, p. 2).

It was at the start of her tenure that UCT adopted its new mission statement. The shift in tone from the old values (mission statement) to the new is noteworthy. In the new mission statement, UCT stated its mission as follows:

> Our mission is to be an outstanding teaching and research university, educating for life and addressing the challenges facing our society (UCT, 2005, adopted in 1996).

The phrase 'outstanding teaching' in the new mission statement implied 'research-based' teaching, which was a more refined position to that of 'special teaching' for disadvantaged

students in the old mission statement. However, it was not made clear in this document what such 'research-based' teaching entailed.

With regard to 'addressing challenges facing our society', the mission statement indicated that, among other things, it was important that UCT:

- 'be flexible on access, active in redress, and rigorous on success' (UCT, 2005).

The shift in the ideas and propositions at UCT was influenced by the new policy propositions of the DoE, although not entirely so. This influenced the establishment of ADPs for disadvantaged students. The section that follows describes some of the key SEPs of UCT that shaped the situation for students at T^1, with specific reference to how these are applicable to the EBE faculty.

4.2.2 Criteria for completion, readmission and Duly Performed Certificates (DP)

In the period leading up to T^1, the EBE faculty handbook (UCT, 2008a) specified that, in order to meet the requirements for a BSc in engineering, a certain overall minimum of credit must be attained in each of the four programmes; this was broken down into different academic years, as summarised in Table 4.1.

Table 4.1: The credits criteria for completing a degree programme in the EBE faculty

	Chemical	Civil	Electrical	Mechanical	ASPECT
1st year	148	144	144	144	104/108
2nd year	144	144	144	144	-
3rd year	124	132	132	132	-
4th year	124	144	132	132	-
Electives	48	16	24	24	-
Total	588	580	576	576	

Each programme specified the credits required from core courses in each academic year, together with the credits required from non-core courses. The non-core courses were either courses within the same discipline or from a different discipline within the EBE faculty. Each programme moreover specified the credits required from the electives, which could include courses from other faculties. The minimum credits required to complete the degree programme was at least 576. As shown in Table 4.1, students in the ASPECT programme

registered for a reduced load in first year, compared to students in the mainstream programmes.

The criteria for progression from one academic year to the next also varied between the mainstream and the ASPECT programmes. UCT (2008a, p. 20) rule FB8.2 specified that a student may be excluded from the degree programme if:

(a) 'he/she is in his/her first year of registration at a tertiary institution, and in the course recognised for the degree fails to obtain at least 80 credits or, if registered through the Academic Development Programme, ASPECT, to obtain at least 64 credits; or
(b) …
(c) …
(d) he/she, in any subsequent year of registration, fails in the courses recognised for the degree to obtain at least 192 credits over each successive two-year period, or if first registered through ASPECT, to obtain at least 160 credits over each successive two year period.'

With regard to meeting the criteria for assessment in courses, particularly in relation Duly Performed (DP) certificates, UCT (2008a, p.19) had the following rules:

- 'FB6.1 *General* Courses are assessed by formal examination, by review or by satisfactory performance of the duly performed certificate (DP) requirements. If a course is assessed by formal examination or review, a student may be refused permission (DPR) to present himself/herself for the examination or review if he/she fails to satisfy the Senate that he/she has satisfactorily attended and duly performed the work of the class by the date set in the conditions for the award of a DP certificate.
- …
- FB6.3 Duly *Performed (DP) Certificate* A DP certificate may be withheld unless (i) all parts of each project, tutorial and other assignments are completed to an acceptable standard and submitted for assessment at stipulated times; (ii) there is satisfactory attendance (as prescribed by Senate) and satisfactory participation in all sections of the course.
- FB6.4 Duly *Performed (DP) Courses* In courses where the DP certificate constitutes the final result, the candidate is required to satisfy the assessor that he or she has satisfactorily attended and duly performed the work of the class by the date set in the

conditions for the award of a DP certificate. The result is published as an ungraded pass (PA) or duly performed certificate refused (DPR).'

In addition to the criteria outlined above, the shape of an academic calendar is considered a significant SEP that shaped the situations for students at T1.

4.2.3 The shape of the academic calendar at UCT

An academic year calendar is an important SEP of a university because, among other things, it helps a university to plan its time and resources accordingly. As with all contact universities, the key parts of the UCT academic year calendar include: teaching, research, consolidation, examination and graduation periods. The teaching period at UCT is a minimum of 60 days per semester and this is divided into two terms by a 'short vacation' of one week's duration. The research period is more difficult to define because research is an on-going activity that academics often do parallel to teaching. Academics supervise postgraduate students, write papers, and attend conferences during the semester. Academics also utilise the out-of-term period for research. Consolidation and examination periods – or the 'assessment period' – happen simultaneously at the end of teaching period. Prior to T[1], however, UCT shortened the assessment period. Table 4.2 depicts the changes effected in the assessment period from 2005 to 2007.

Table 4.2: The assessment period during the 2005-2007 academic year

Year	First semester		Second semester	
	Consolidation period (days)	Examination period (weeks)	Consolidation period (days)	Examination period (weeks)
2005	7	3	7	3
2006	6	2	5	2
2007	6	2	6	2

UCT reduced the consolidation period from seven days in each semester in 2005 to six days in each semester by 2007. The examination period, which lasted three weeks in 2005, was reduced to two weeks by 2006. In a memorandum that specified the reasons for the change, the Registrar stated that:

> We see very significant academic advantages in this, but emphasise that course design, and method of assessment, will have to take account of the

> reductions in time for consolidation and formal examination. For example, courses should not introduce important new conceptual material late in the course, and with a reduction in the period for consolidation, students will need to be encouraged to work consistently (UCT, 2003, p. 1).

To reduce the examination period from three weeks to two weeks, UCT also changed the examination slots from two per day to three. After executing a mock examination timetable to investigate whether three slots per day could work, the examination office raised a concern to indicate that it was already difficult to plan an optimal examination timetable over three weeks, especially for first year students (UCT, 2004b). The examination officer stated that:

> I am sure that the proposed change to a two-week examination period is well intended and will have its supporters, but as the examination officer and the person who does all the actual work when it comes to setting the examination timetable, I cannot honestly say that I see the merits of this change (UCT, 2004b, p. 6).

A sub-committee, which was appointed by the Senior Executive Committee, investigated students' concerns regarding the proposed change in the academic year calendar. They raised a concern that the impact of 'abolishing' the consolidation period 'may have a negative impact on students' throughput rates' (UCT, 2004a, p. 2). Despite the concerns raised by this committee and the examination office, the EXCO approved the new academic year calendar. It commenced in 2006. The consequences of the changes in the academic year at UCT are relevant to the T^2-T^3 at the interaction level; their conditioning influence will be examined in relation to students' projects in Chapter 5 to 8.

4.3 The cultural and structural landscape of ADP and ASPECT

In 1999, UCT established the Centre for Higher Education Development (CHED). CHED took on the developmental role to assist UCT in addressing the challenges brought about by the increased participation of other racial groups. The Academic Development Programme is CHED's largest programme; it was established to improve equity in UCT's student body by running various faculty-based programmes that provide access and support for black students. Having received a funding commitment from the DoE, the ADPs that already existed were modified to meet the new funding criteria (Kloot, 2011). Through 'extended curricula', AD

practitioners in various faculties focused on offering foundational courses. ASPECT, which forms the context of this study, is one such ADP.

4.3.1 The ASPECT programme

ASPECT is one of the oldest ADPs in South Africa; it was established in 1988 when a number of large industrial companies committed bursaries for top black school leavers who, although they were the top students in their year, were nonetheless deemed to need education support to succeed in engineering at UCT (Le Roux, 2009). In addition to the bursaries, the companies paid a levy to ASPECT for each student; these funds were used to employ ASPECT staff (Kloot, 2011). To describe the conditioning at T[1], however, this study focuses on the ASPECT programme in the post-apartheid period between 1995 and 2008.

The ASPECT review report states that the primary objective of ASPECT is 'to improve the graduation rates of students from a disadvantaged educational background' (Le Roux, 2009, p. 4). To pursue this objective, ASPECT's primary role 'has thus been to provide access and academic support for black and coloured students who enter the EBE faculty from poor schooling backgrounds and to give them the best preparation for further years engineering studies' (Le Roux, 2009, p. 4). The best preparation entails providing students with 'excellent teaching', 'good tutoring', 'mentoring' and 'counselling' in their first year.

ASPECT went through some structural and ideational shifts during the period under review. The first notable structural shift took place from the mid-1990s when the number of black students admitted to the mainstream programme began to increase. As the success rate of black students in the mainstream programme increased, companies that formerly used to fund top black school leavers through ASPECT opted to fund them through the mainstream programme instead.

Following the structural shift above, the increasing number of black students in the mainstream programmes resulted in an ideational shift in the traditional role played by ASPECT. When companies decided to shift sponsorship to fund top black students through the mainstream programme, ASPECT widened access to admit students who had not met the minimum requirements. In recent times, ASPECT has thus extended its support to students who struggle to cope with the demands of the mainstream programme (Le Roux, 2009). Such students can opt to join ASPECT and increase their chances of success in their studies. The

next section depicts the role that ASPECT played during this time (i.e. from 1995 to 2008) to improve the graduation rates of black students in the EBE faculty.

4.3.2 ASPECT's registration and graduation numbers

It is worth noting that, during the period under review, ASPECT admitted three distinctive categories of students. The first category comprised students who followed the traditional five-year curriculum. The second category, referred to as 'fliers' (Le Roux, 2009), comprised students who, whilst having met the minimum requirements for the mainstream programme, were required by their sponsor to register through ASPECT. Unlike students in the first category, 'fliers' followed the four-year mainstream curricula, except that they attended mathematics and physics offered in ASPECT. The idea was to give 'the fliers' the opportunity to 'fly' and complete their degrees in four years. The last category of students, termed the 'EFP', consisted of students who entered through the Engineering Foundation Programme (EFP). The EFP had been established, as a subset of ASPECT, to assist students who were struggling in the traditional ASPECT programme. EFP combined some courses that were taught by ASPECT staff with those provided by the General Entry for Programmes in Science (GEPS). EFP was later terminated because the success rates of students in the programme was poor and thus did not justify the resources put into it (Kloot, 2011).

Registration numbers

According to data from the UCT Institutional Planning Department (IPD), from 1995 to 2008 a total number of 1,405 students were admitted to EBE through ASPECT. Figure 4.2 displays the ASPECT cohorts for the period.

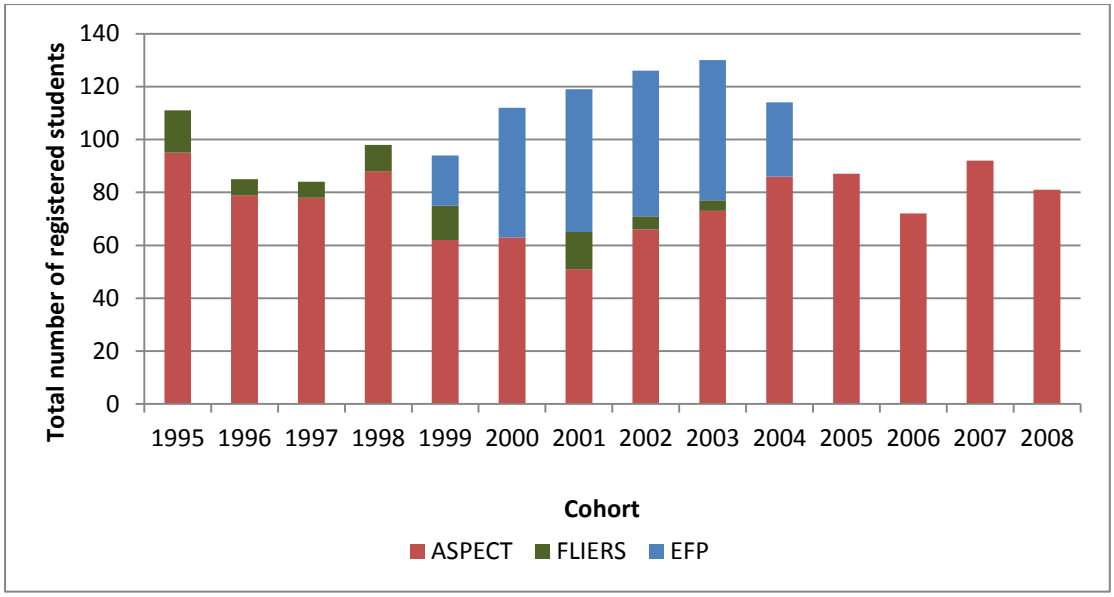

Figure 4.2: ASPECT registrations during the 1995 - 2008 period

As illustrated, the number of students in the cohorts ranged between 72 and 130. The number peaked when ASPECT admitted 'EFP' students. In 2003, ASPECT recorded its largest cohort of 130 students. In 2004, the 'fliers' category, which had been decreasing steadily, was terminated. In 2005, ASPECT stopped the EFP altogether.

With regard to the racial contribution of ASPECT to the EBE students' intake, Figure 4.3 shows that 1,001 African students and 98 coloured students were registered through ASPECT; this contributed 37 percent and 15 percent to the faculty intake of the two racial groups respectively.

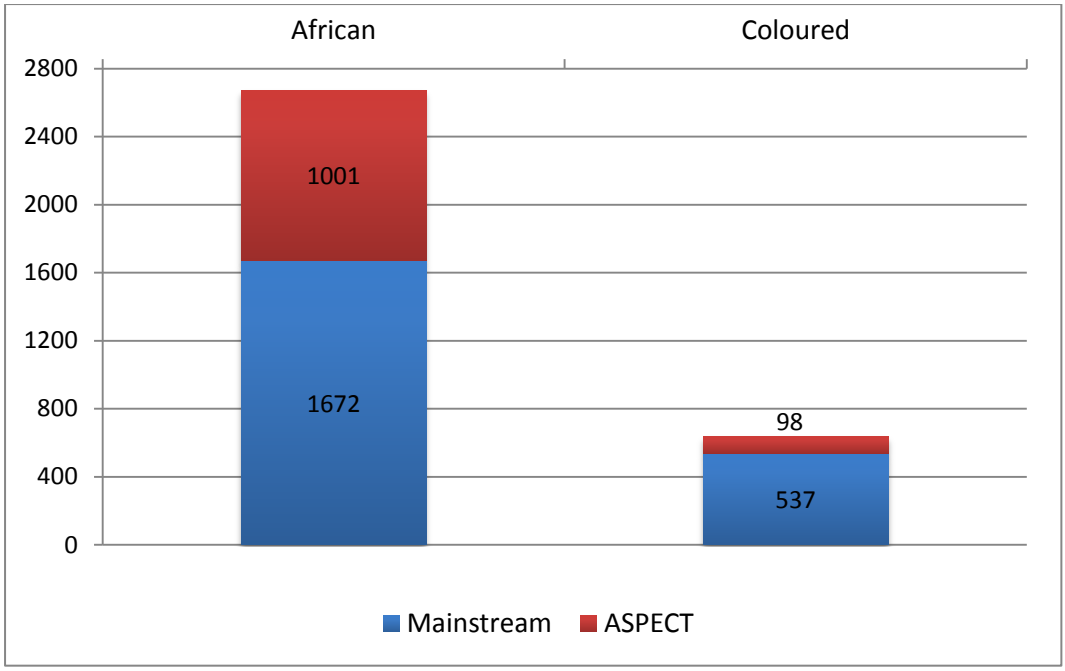

Figure 4.3: The first year registration numbers of African and coloured students in ASPECT and in the mainstream programme (1995 - 2008)

Throughput numbers

With regard to throughput, Figure 4.4 displays an analysis of the ASPECT cohorts from 1995 to 2003. For each cohort, it shows the number of students who graduated and those who were excluded. The 'other' category includes students who were unaccounted for, such as those who may have transferred to other faculties and those who may have left UCT in good academic standing.

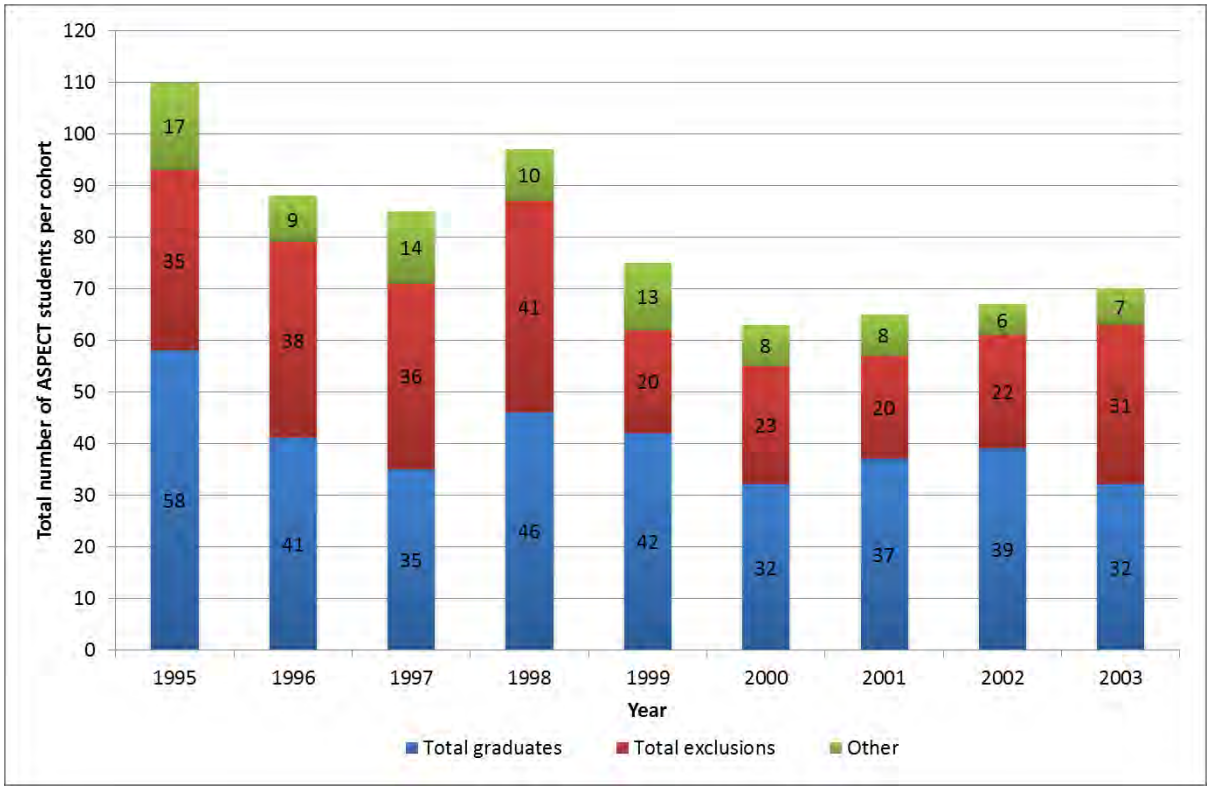

Figure 4.4: Numbers of ASPECT students

The data in Figure 4.4 above suggests that ASPECT contributed considerably to the demographic intake and the success of students in EBE faculty. On average, during the period from 1995 to 2003, 51 percent of the intake graduated and 40 percent were excluded, while nine percent were unaccounted for.

To present a further description of the situation at T^1, the structure of the ASPECT curriculum is described in the next section.

4.3.3 The ASPECT curriculum structure

The curriculum is a critical SEP that shapes situations for students. Here, the term 'curriculum' refers to a structured set of courses that students are required to pass to progress to the next level. Students accumulate credits for passing the courses until they attain the number of credits required to qualify for a specific degree. This section describes how the ASPECT curriculum evolved in the period leading to T^1.

The original ASPECT curriculum was based on the principle of the 'extended curriculum', which entailed spreading a four-year curriculum over five years. Figure 4.5 depicts the

original ASPECT curriculum model, which is attributed to the work of Sass (1988). The overall model remained largely unchanged during the period under review.

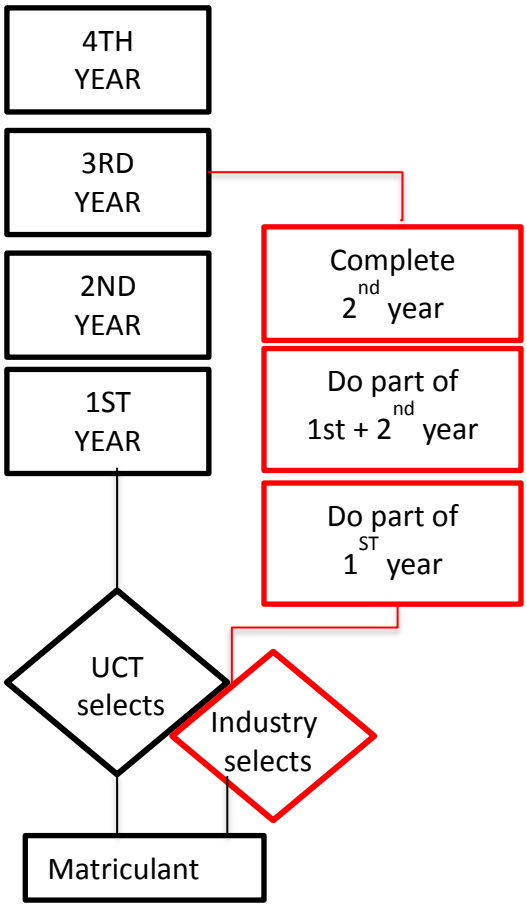

Figure 4.5: The flowchart of ASPECT and mainstream curricula

Spreading the four-year curriculum over five years was achieved by spreading the curriculum of the first two years over three years. During the period under review, the first year curriculum consisted of four courses: Mathematics 1, Physics 1, an Introduction to Engineering course and a Communication course. Mathematics 1 and Physics 1, which were equivalent to the mainstream courses, were taught and assessed by the ASPECT staff. The difference between the ASPECT-taught courses and the mainstream courses was that the former was allocated more time through longer lectures, tutorials and workshops. The Introduction to Engineering courses were discipline-specific and were taught in the respective departments. A CHED staff member lectured the Communication course once a week. In subsequent years, students completed the remaining first year courses, together with some second year courses. The curriculum was such that every year over three years students registered for courses at two levels of study.

Whilst the ASPECT curriculum was well documented for the first year, this was not necessarily the case for subsequent years. During the investigation, it was found that, apart from chemical engineering, other disciplines in the faculty did not have documented curricula for 'straight-through' ASPECT students. I developed the chemical engineering curriculum for ASPECT in 2007, when I was employed as an Academic Development Lecturer. Thus, as part of the investigation for this study, I documented the curriculum guidelines for ASPECT students in other disciplines based on existing practice; the four curriculum guidelines are presented in Appendix 3. During this documenting process, it was found that, in fact, only mechanical engineering followed the original model, by spreading the first two years over three years. The curriculum in the other disciplines, however, followed different models; they are briefly described in the next sections.

Chemical engineering

The chemical engineering curriculum guideline for the ASPECT programme spread the first three years over four years. ASPECT students registered for three core courses in first year: Mathematics 1, ChemEng 1 and Chemistry 1. ASPECT staff taught Mathematics 1, while ChemEng 1 and Chemistry 1 were taught in their respective departments. Physics 1 was delayed to the second year, while Drawing 1 was delayed until the third year. Although Physics 1 was scheduled into second year, it did not fit properly into the second year timetable. The ASPECT physics lecturer thus scheduled a separate tutorial for the chemical engineering students, outside the normal tutorial period, because there was a timetable clash with a second year course. Apart from the timetable clash, Physics 1 was a prerequisite for second year chemistry; this implied that students had to delay Chemistry 2 until the third year. The delayed second year chemistry also meant that students had a 'gap year' between first and second year chemistry.

It is worth noting that, four years prior to T^1, the ASPECT chemical engineering students had registered for Physics 1 in first year instead of ChemEng 1. The change in curriculum to have ChemEng 1 in first year, although it meant delaying other courses, was intended to minimise the structural consequences for students who might fail this course. Prior to the change, ASPECT students who failed ChemEng1 or other core courses in second year were automatically on a six-year programme.

Civil engineering

The curriculum guideline that was developed for civil engineering ASPECT students as part of this study indicated that the first three years were spread over four years. ASPECT students registered for three core courses in first year: Mathematics 1, Physics 1 and CivEng 1. They then registered for the three remaining first year courses, Chemistry 1B, EngStatics and Drawing 1 in second year, together with some second year courses. They completed the remainder of the second year courses in third year and registered for some third year courses. Students then completed the outstanding third year courses in the fourth year and joined the full mainstream programme in their fifth year.

Electrical engineering

The curriculum guideline for electrical engineering indicated that the four-year curriculum was spread over five years. In the first year, ASPECT electrical engineering students registered for three courses: Mathematics 1, Physics 1 and ElecEng 1. They registered for the remaining first year courses in second year together with some second year courses. They continued to straddle curricula between the years until they had completed their fourth year. As a result of spreading the four-year curriculum over five years, the electrical engineering curriculum offered ASPECT students greater flexibility to accelerate their studies; this could be attributed to the greater flexibility of the prerequisite courses.

Mechanical engineering

The curriculum guideline for ASPECT mechanical engineering indicated that the first two years were spread over three years. In the first year, students registered for Mathematics 1, MechEng 1 and Physics 1. They completed the other three first year courses in their second year, together with some second year courses. They registered for the remainder of the second year courses in their third year. They then joined the mainstream curriculum in their fourth year, to complete the third year mainstream curriculum.

4.4 Conclusion

This chapter sought to describe some of the structural and cultural conditions that shaped the academic situation for students at T^1. It started by describing how the ideas and propositions of the post-apartheid DoE, specifically in relation to redressing unequal opportunities in higher education, shaped the higher education landscape in which universities had to operate. It was indicated that the transformation of the student population at UCT was already underway prior to the end of apartheid, but that the policies of the new DoE increased the pace of such transformation. By committing to providing funding for ADP, the DoE enabled institutions to implement the appropriate structures, or in cases such as ASPECT that had previously been soft-funded, to have a reliable source of funding. The role that ASPECT played in increasing the intake and graduation numbers of black students in the EBE faculty has been described in this chapter.

UCT as an autonomous institution had its own values and missions and structures in place, which shaped the conditions for students at T^1. Aspects of the structure detailed in this chapter include the shape of the academic calendar, the changes in the examination timetable and the criteria for completing an engineering degree. The discussion about the relations between the components of list is not exhaustive, as some may or may not be activated during the social and the socio-cultural interaction stages. The next four chapters present the results of the T^2-T^3 stage, in which the aspects of structure and culture that were activated become apparent. The decision was made to present the results according to specific departments so that pertinent aspects of structure and culture that are specific to the departments can emerge – given the crucial structural significance of curriculum and the broader cultural important of the departmental context. A discussion of how culture and structure shaped the situations for agents in this study is then detailed in Chapter 9.

Chapter 5 - Chemical engineering students

Chapter 4 described the first stage of the morphogenetic cycle, the structural and cultural conditions that confronted students at T^1. The next four chapters present an account of the socio-cultural interaction stage T^2-T^3; each chapter presents the students' four-year journey through their respective engineering departments. This chapter focuses on the journeys of the three chemical engineering students who participated in this study. It begins by briefly introducing the students' backgrounds to account for the emergence of their primary agency followed by an outline of their concerns and projects – key Archerian concepts describing the emergence of personal identity. The subsequent sections account for the students' deliberations about the constraints and enablements they encountered, as they made their way through each academic year – herewith the interplay of structure and agency.

5.1 Students' backgrounds

The three students are Ogone, Dyllon and Tebogo. Their narratives are presented as follows.

5.1.1 Ogone's background

Ogone was the second of three children; his grandmother raised him and his elder brother when his mother married his stepfather and relocated to another village. He said that, in the absence of his mother, his grandmother took care of him and taught him much of what he learned during his formative years. By the time he was in high school, he helped his aging grandmother with household chores such as cleaning and cooking. Financially, he depended on his grandmother and his elder brother; he said they were also the two people he felt closest to. Although his mother came to visit every once in a while, Ogone added that he was closer to his grandmother and thus preferred to confide in her.

Ogone came from an area called Phokeng near Rustenburg in the North West province. Despite the fact that the areas near Rustenburg are known for their mining activities, owing to the presence of platinum deposits, the nearby communities were characterised by high levels of poverty and alcohol abuse. Ogone indicated that he did not drink alcohol, and that he distanced himself from activities in which his peers consumed alcohol; he had decided not to identify with this aspect of his natal context. He explained that he grew apart from his

childhood friends because he did not want to associate with ‘drunk’ people. Instead, he chose to have one friend whom he said was as reserved as he was.

By the time he had completed his primary schooling, he had already weighed his options and decided to apply to a high school outside his community, which showed that he was willing to leave behind his natal context to seek better education prospects. He had been ‘demotivated’ by the local high school, as he often saw learners at the school ‘doing all the bad stuff’. According to Ogone, the school did not have good teachers and ‘it was struggling’. His grandmother and brother supported his decision to attend a ‘good’ DET school in another area and funded his commuting costs. Moving to a new school appeared to have enabled Ogone to do well academically; he reported several benefits including the availability of teachers, an opportunity to attend Saturday school, and the fact that he met and made two new friends. The three of them became top students at the end of grade 12.

Unlike his high school friends, Ogone had not applied to a university at the end of his schooling. Initially, he remarked that he had been ‘too shy’ to appear in person and submit a late application form. It emerged later that his reason for not applying to further his studies was because he was deeply concerned that, in his absence, no one would look after his grandmother. During the year that he stayed at home and looked after his grandmother, he kept in contact with his two friends, who were then studying engineering at the University of Pretoria (UP). He said that, while he was home that year, his grandmother encouraged him to apply to university. With her blessing, he applied and secured funding through the Royal Bafokeng scheme, a bursary scheme funded by the local shareholding beneficiary of the platinum mine, to study chemical engineering.

Having received limited career guidance at school, Ogone chose to study engineering because he knew that ‘engineers were paid a lot of money’ (an indication that he sought upward social mobility), and that he required mathematics and science to study it. He applied for chemical engineering because he thought that it entailed more chemistry than physics. Although he would have liked to apply to more universities, he applied only to UCT and Wits, because he had been constrained by limited financial resources. Part of the reason why he applied to UCT, he added, was that it had the cheapest application fee of R90 at the time. His second option Wits had an application fee of R250. Both universities accepted him to study chemical engineering; however, UCT accepted him on condition that he studied through the ASPECT programme. His decision to study at UCT, approximately 1,500 kilometres from Ogone’s

home, entailed a significant contextual discontinuity. Wits, which was only approximately 200 kilometres away, was closest to home. However, although he had been accepted into the mainstream programme at Wits, he decided to accept the offer at UCT. Wits required a registration fee of R5,000, which his family could not afford to pay; furthermore, his bursary was granted on condition that he studied at UCT. His decision to accept the offer to study at UCT and to receive a bursary effectively reduced his financial constraints.

Ogone remembered some of the challenges that he encountered when he first arrived at UCT. Firstly, he found that people generally communicated in English; he was 'not comfortable' with English, as he spoke Setswana at home. Secondly, being 'generally quiet and reserved', as he described himself, he found it difficult to make friends. Fortunately, however, he reconnected with 'Vincent', a second year chemical engineering student to whom he had been introduced in the preceding year at home. Ogone and Vincent stayed at the same student residence; he later found this useful. He described his first two weeks of university as 'the worst' of all his time at UCT, and emphasised that orientation week did not help him settle into the university environment.

With regard to ASPECT, Ogone indicated that he was not comfortable with the idea of a 'special programme' because this for him suggested that students in the programme 'could not do it like other people'. He stated that he believed that he was capable of completing an engineering degree in four years and did not understand his placement in a five-year programme. Moreover, he believed that his discomfort about being in ASPECT influenced his ability to make friends. Nonetheless, he acknowledged that, although he was uncomfortable with the idea of being in ASPECT, the programme did help him to meet people who spoke his home language, something he had not found elsewhere on campus. However, he also indicated that, because his fellow students in ASPECT were staying at different residences that were far apart, he could not pursue potential friendships with them.

Although Ogone described himself as 'shy' and 'reserved', he had initially been confident in his ability to complete the degree within the minimum time in the mainstream programme. When he arrived at university, however, his experience was far from what he thought it would be. He mentioned many constraining situations, which will be discussed in due course.

5.1.2 Dyllon's background

Dyllon was from Mitchell's Plain, one of the largest townships on the Cape Flats. He described the area of Mitchell's Plain that he comes from as 'violent' and marred by 'gangsterism, lack of information, and bad influences'. He was the first person from his family to attend university. He described his family as a 'tight-knit Christian' family. His father, a trained pastor who no longer practiced his profession, ran a tourism business. His mother was a stay-at-home mum. His younger brother was in his final year at primary school. Dyllon's family appeared to be supportive with regard to his education; since he had been identified as struggling with dyslexia in primary school, his father had paid for him to get extra help from private tutors until he completed high school. He said that, despite the fact that his family was not financially 'well-off', his parents ensured that he received the necessary academic help. It was clear to him, however, that his family could not afford to pay his fees at university; he thus applied to the National Student Financial Aid Scheme (NSFAS) to further his studies.

Dyllon described his high school as dysfunctional; he indicated that some teachers 'would never pitch' for school. He added that it was 'normal' for teachers to be absent on Mondays and Fridays to the point that, when there was a teachers' strike in his final year, he did not notice because he was so used to the teachers' absence. He said that, prior to him, no one from his school had ever made it to UCT to study engineering. Furthermore, out of 20 students with 'the potential to make it to university, only two made it', namely himself and his girlfriend. He said that other students made it to colleges and the Cape Peninsula University of Technology (CPUT), but most of them had since dropped out. Although Dyllon painted a grim picture of the school, he chose to remain in it, probably due to its proximity to his home.

Dyllon was from Cape Town and, unlike Ogone, he did not intend to leave his natal context, indicating that he wanted to remain close to his family. He said that he had initially wanted to become a fighter-jet pilot and had applied for military training in Pretoria, approximately 1,500 kilometres away; when he was accepted, however, he declined the offer, as he was not ready to move away from home. He thus avoided the potential constraints of being away from home and instead opted to study engineering at a nearby university.

When he was deciding where to study engineering in Cape Town, he had to choose between two English-medium institutions, UCT and CPUT. Dyllon decided to apply to UCT because he perceived its standards and reputation to be better than those of CPUT. As with Ogone,

chemical engineering was his first choice because he believed that he would be studying mathematics and chemistry and that he would not be required to do drawing. Like Ogone, Dyllon too was unhappy that he had been accepted through the ASPECT programme because he wanted to get out of studying 'as fast as possible'; nonetheless, he understood that he had not met the minimum requirements for the mainstream programme. He indicated that, owing to the daily commute from home to UCT, he struggled to be integrated into UCT, as he could not participate in all the orientation activities. The commute furthermore limited his interactions with other students. He said that he made friends with other local coloured students in the ASPECT class, a group with which he could identify. However, unlike him, they were all studying mechanical engineering.

5.1.3 Tebogo's background

Tebogo, like Ogone and Dyllon, was the first in his family to attend university. He came from Batho location, one of the oldest townships in Bloemfontein. His mother's aunt, whom he referred to as his 'grandmother', raised him because his mother, having given birth to him when she was 16 years old, was unable to raise him. Although he had never lived with his mother, he used to visit her during school holidays. His mother died when he was seven years old, having never told him about his father. Tebogo indicated that he never had a father figure at home because his grandmother was not married. Moreover, his grandmother did not have her own children; instead, she raised Tebogo as her only child. Tebogo's grandmother was a nurse; this enabled her to provide him with a better quality education than that received by Ogone and Dyllon. He attended a private school until he finished grade 2; thereafter he changed to a Model C primary school, when the combined private school tuition and transport costs became too expensive. He subsequently attended a well-resourced Model C high school for which his primary school was a feeder.

Tebogo's upbringing and schooling appeared to be relatively positive until his dream of becoming a commercial pilot was dashed. He said that he had been passionate about becoming a commercial pilot throughout high school. He was aware that his grandmother could not afford to fund him through flight school, and thus explored every avenue known to him for funding. However, he said he was left 'broken' when his efforts did not yield positive results. He indicated that he had not seen himself as anything other than being a pilot, and pursuing a university degree was 'never part of the plan'.

In the absence of funding to pursue his primary project, Tebogo had to have an alternative. He applied to UCT after his teacher gave him the application forms and encouraged him. He indicated that he had found it difficult to decide on what to study and he 'literally went through each and every career' in the UCT prospectus. Eventually he applied for astrophysics as his first option, indicating that he had thought that it would one day get him to work with aeroplanes; he later realised that this was a misconception. His second option was chemical engineering and he chose this because his girlfriend's brother, who was himself studying chemical engineering, persuaded him to 'try it out'. He said at that stage he was 'just going with the flow'.

He was provisionally accepted into mainstream chemical engineering; however, he had been demotivated to study for his final matric examinations when his plans of getting into a flight school were dashed. As a result, he did not perform well enough to be admitted into the mainstream programme and he was thus offered a place in ASPECT. At the time, he was not really concerned about being in ASPECT or in the mainstream programme. He said he was just at the university to study, and that he was hopeful that he would make enough money one day to pay for his studies at flight school. Tebogo had thus started his studies to pursue a secondary project, after the lack of financial resources constrained his primary project.

The next section describes students' concerns and projects.

5.2 Students' concerns and projects

Ogone indicated that, at the start of his studies, he had wanted to become an engineer so that he could make money; however, his preoccupation with money had changed recently when he realised that it would not give him the 'happiness' he sought. Ogone's ultimate concern was thus articulated as 'being happy' and this entailed being with his family:

Like all I see now is that I'm only happy when I'm with my family… So what I do is I go to my sister and take her kid and then go to my aunt and take her kid, and then we all go home and I spend time with them. That's when I feel most happy. That's what I like the most. [Ogone's interview, p. 36]

In order to realise his ultimate concern of 'being happy', Ogone's project was thus articulated as obtaining an engineering degree, which he believed would provide him with the financial resources to be able to support his extended family.

Dyllon stated that his dream was 'to live a comfortable life', in which he could afford to support his family. Thus his ultimate concern could be articulated as 'affording a comfortable life'.

After the [chemical engineering] degree, ultimately I am aiming for a comfortable life, just knowing that you can sufficiently support your family and stuff like that. [Dyllon's interview, p. 23]

Dyllon's project was thus articulated as obtaining a chemical engineering degree, which he believed would help him to realise his ultimate concern of achieving a comfortable lifestyle.

Similarly, Tebogo's ultimate concern was to lead a life in which he could afford the things he wanted:

I don't think of a lavish life; I want to be able to afford what I want, to also be able to save up for what I want. I don't want to be filthy rich, but I want to be able to afford [things]…. [Tebogo's interview, p. 38]

Tebogo came to university to study for a degree, but regarded his degree as 'something to fall back on', as he hoped that it would one day allow him to afford flight school. His project was thus to complete the chemical engineering degree, even though it frustrated him and was not his first choice.

Although all three students' projects entailed obtaining a degree, none of them mentioned that they were studying engineering for the love of it. They all wanted to obtain the degree in the (fallible) hope that it would help them to realise their ultimate concerns. The sections that follow detail the students' deliberations with regard to the constraints and enablements they encountered, as they progressively made their way through each academic year.

5.3 Students' deliberations about the first year

5.3.1 Ogone: First year

With regard to his social life at university, Ogone encountered several constraints; he indicated that his 'shy' nature, his uneasiness about being in ASPECT and the fact that the ASPECT students that he had met stayed in residences that were far from his, all made it difficult for him to make friends. Apart from Vincent, whom he had already met before he came to UCT, he struggled to make friends with other students.

With regard to his academic experiences, he shared some of the early constraints he had encountered in the first few weeks at UCT. Firstly, he indicated that he was intimidated by the use of English and the race of the lecturers:

In high school they used to speak English here and there... But then here it is like, you even get [a] white lecturer, who speaks his own language and then sometimes you don't quite get what he is saying because he talks too quickly and I didn't quite get what he was saying sometimes. So that made it even harder. [Ogone's interview, p. 17]

Secondly, Ogone found it difficult to adapt to the use of power point slides in lectures, as this increased the lecture's pace, which placed even more pressure on him. Thirdly, he found that lecturers often expected him to have prior knowledge of some concepts, which he said he had not learned before. For example, he spoke about his experience of the first tutorial in the ChemEng 1 course with some sadness: the class was expected to apply prior knowledge, together with what they had learned that week, to solve a set of problems. However, not only did Ogone not have any prior knowledge of these concepts, but he had thought that he could take the tutorial and complete it at home; he was 'shocked' when he was informed that he was expected to complete it by the end of the afternoon. The tutorial set-up entailed students working in groups of three. He had assumed that the group mates would tackle the problems together; however, he was baffled by the fact that his group mates worked individually and completed the tutorial within the first two of the three hour-long tutorial slot and then left him stranded. He compared himself with his group mates and found it difficult to understand why he had struggled to complete the tasks:

That day after that tutorial I felt like maybe I shouldn't have done chemeng. I mean these people [the group mates]... I thought with Kabelo, he was doing it for the first time and Kale

for the second time. But I thought, OK we are all from school and we are experiencing the same thing, but then for them it was so easy. [Ogone's interview, p. 15]

After the two students had left, he was 'too embarrassed' to ask for help from the tutors because, after two hours, he had not gone past the first tutorial problem. At that point, he was overcome by various emotions, including the feeling that he should not have studied chemical engineering. Upon reflecting on his situation, he realised that high school had not adequately prepared him:

I felt like OK, maybe it is just me because I saw that everyone was doing well [with the tutorial], they understood. For me, I just thought, no it is just me, I chose the wrong thing. I was not supposed to do chemeng. So yes, it was lonely as well. For me, I felt like what I was taught in high school didn't really help me…. [Ogone's interview, p. 17]

That afternoon, he went to his room and cried, when it dawned on him that he had gotten himself into a situation with which he could not cope. He later approached Vincent for help and managed to complete the tutorial. When asked why he had not changed to another programme, he explained:

I didn't think of giving up. I just thought OK, I've already started and they are already paying a lot of money for my course. So I knew that after starting, there is no going back, so I just have to go through this. I didn't know how I was going to make it, but I just knew that somehow I just have to manage. [Ogone's interview, p. 18]

Here, Ogone was referring to the bursary he had received and the money that his family had contributed to get him to UCT.

Despite the initial difficulties he encountered, he also mentioned some enabling academic experiences. For example, he indicated that his experience in Mathematics 1, which was taught by Dr Smith in ASPECT, was pleasant. He described Dr Smith as being 'more like a teacher' than other lecturers. She 'cared' enough for students to learn all their names. Moreover, she made an effort to give individual comments in assessments. He said that Dr Smith made Mathematics 1 enjoyable and that, although she was a 'white female', she was not as 'serious' as the lecturers in the other courses and she often 'made jokes' in class. Despite the challenges he encountered, Ogone reported that he passed all his first class tests.

He scored 50 and 51 in Chemistry 1 and ChemEng 1 respectively. Although he scored 60 in the Mathematics 1 test, he expressed disappointment with his grade, because he thought he had done better.

In addition to the social and academic constraints that Ogone mediated in his first year, his grandmother died during the third term. Her death left him with mixed feelings: A part of him understood that she was old and had been ill; however, another part of him experienced the pain of losing the only person to whom he had felt close. Furthermore, he explained how he had to draw strength from her passing; he realised then that he needed to work even harder at his studies. He said that, in her absence, he had to rely on himself completely:

*I just had to focus. I thought OK, now she is no longer there and I was on my own. So I just worked very hard. Even in math*ematic*s, where I didn't put in much effort before, but after coming back from her funeral, I just kept on working more on it. I didn't sleep at 12 anymore; I slept maybe at 1:30 am. I started to really work… I didn't think of anything else.* [Ogone's interview, p. 24]

As Ogone reflected on his first year's experiences, he indicated that, although he adjusted to the academic workload, his social life did not improve. He continued to feel 'isolated' and generally spent time in his room. Although opportunities to work and socialise with his classmates did arise, he withdrew whenever he felt that they solved problems more quickly than he could; he remarked that the added pressure made him feel insecure. He admitted that, at the end of the year, he looked forward to going home because he felt that every day at UCT had been 'torture'.

5.3.2 Dyllon: First year

With regard to his social life, Dyllon indicated that, although he was initially constrained by 'not knowing anyone', the fact that he was from Cape Town did enable him to make friends with other local coloured students in the ASPECT class, even though they all studied mechanical engineering. He had not made friends with other ASPECT chemical engineering students and only interacted with them during the chemistry/chemical engineering workshops on Wednesday afternoons. At that stage, not having friends in the chemical engineering group did not affect him, since he had registered for the same courses as his friends, except

for one course, ChemEng 1. Although it thus appeared that Dyllon had adjusted easily, it later emerged that his choice of friendships became a constraint in his second year.

With regard to his academic experiences, Dyllon indicated that he noticed a 'huge' difference between the workload at school and the workload at university, and he felt underprepared for the latter. He admitted that all the private tutoring he had received while at school had enabled him to succeed and noticed that being at university meant that he 'actually had to do the work'. Apart from the initial constraints, such as adapting to the increased workload and the fast-paced lectures, he managed to adjust to the everyday life of the various courses. Like Ogone, he pointed out that Mathematics 1 was his favourite course.

With regard to some of the situations he encountered outside his academic life, Dyllon reported his major constraint as finding it difficult to adjust to his new routine of commuting to the university, particularly because he had to wake up early to make it to his first lecture at eight.

That's one thing I had to adjust to... like waking up at 5:30 a.m., I wasn't used to it. I used to stay 2 km from school. I could wake up at 7 a.m. and all of a sudden I had to wake up at 5:30. That was very challenging, to make the 8 o'clock lecture. [Dyllon's interview, p. 26]

5.3.3 Tebogo: First year

With regard to his social life, Tebogo indicated that he became friends with two ASPECT chemical engineering students. These friendships served as an enabling factor because, as he stated, 'it was good to know that there were other people in the same boat'. He clarified that he did not need friends to help him in his courses as he could do them independently; however, he needed the friends to help him keep focused on something he would prefer not to be studying. He later talked about the challenges he faced when this support group collapsed, when one of his friends was excluded from the university.

Tebogo, unlike Ogone and Dyllon, was not alarmed by either the workload or the fact that the lecturers were of a different race; he said that his [Model C] school had introduced him to diversity. He did, however, express shock at the first lecture of the ChemEng 1 course, having been unaware of what chemical engineering entailed:

I was just thoroughly shocked in the first lecture. I was like what are these? These things are moving and this guy [the lecturer] is separating salt from seawater and he's talking about tanks and stuff and I'm like what?! (We both laugh)… I didn't even know that there is an option of jumping to something else [another programme] you see. I wouldn't know what I'd want to do. I said, OK this is a ship and I'll just follow the leader. We'll just follow this man [the lecturer]. [Tebogo's interview, p. 16]

Apart from his experience of shock at the beginning of the ChemEng 1 course and the fact that he did not really want to study at university, Tebogo passed all his courses that year, suggesting that, once he had invested himself in a project, he was able to mediate the constraints and enablements that he encountered that year. Furthermore, he indicated that he had received good marks in all of his courses, and he blamed the final examination timetable for the ASPECT chemical engineering students that year as the reason why he did not make it to the dean's merit list. He described in detail how the examination timetable constrained the students, stating that they had to write five examinations in three days. He believed that the examination timetable contributed to the fact that many of his peers, including one of his friends, were excluded.

5.4 Students' deliberations about the second year

5.4.1 Ogone: Second year

Ogone indicated that his second year had started more positively than the first year; he was familiar with the institution and knew the commitment he needed to make to his studies. In reflecting about how he could 'survive' second year, he decided to get out of his 'comfort zone' and started to study with other students in various courses. In the Mathematics 2 course, for example, he reported that he noticed the benefits quickly, as working with other students enabled him 'to get help immediately'. He started to work with Tebogo in the key second year chemical engineering course, Material Balances, and indicated that working with him made him realise that he was not the only one facing challenges; this realisation helped him not to feel alone:

Tebogo would talk about things he was struggling with. He would talk about how he feels so I knew that I'm not the only one feeling like this; someone else feels like this [too]. So I started to see that almost everyone feels like this. So that made it comforting at times, when I realised that I'm not alone in this. [Ogone's interview, p. 26]

Ogone passed all his courses that year except for the Material Balances course; however, he registered for the summer term version of the course and passed it. Passing the Material Balances course was a significant enablement for him, as it was a prerequisite for key third year courses.

5.4.2 Dyllon: Second year

Dyllon and Tebogo had also failed the Material Balances course; although both registered for the summer term offering of the course, they both failed it. This meant that, going into the third year, they could not register for key chemical engineering courses. Failing the Material Balances course and its summer term version was partly the reason why they both reported that the second year was more challenging than the first year. Dyllon considered his second year his 'most difficult' year at UCT:

I was looking at my GPA and 2009 was my most difficult. I think I failed Material Balance, Pumps & Fluids, Mathematics 2. I don't know why I failed Mathematics 2… that was the worst year; I got a GPA of 36, which is bad. And that's the year that I actually got excluded from UCT. [Dyllon's interview, p. 14]

Upon reflecting on why he had found the second year so difficult, Dyllon reported that the first reason why things 'went wrong' was that he had not built relationships with his chemical engineering classmates and that his mechanical engineering friends became less helpful in his academic studies. He realised that having friends who studied chemical engineering would have enabled him to seek help when he needed it. Secondly, Dyllon mentioned another constraint: as a second year ASPECT student, he was 'not with the class', suggesting that he could not relate to students in the mainstream cohort. He thus struggled with not knowing whether he 'belonged' with the first year or with the second year mainstream class. Thirdly, Dyllon appeared to have been constrained by his daily commute from home:

And it was partially due to that [the commute] because at that time I couldn't stay late and study after hours on campus because I had to go and catch public transport, so it was partially the reason. [Dyllon's interview, p. 17]

Dyllon reported that a combination of reasons stated above affected his academic performance in second year and that, as a result, he was academically excluded – an

experience he described as ‘shocking’. After consulting with the undergraduate convenor, he appealed on the basis that his daily commute reduced the time he could spend on his studies. His appeal was successful and he was thus allowed to continue into the third year.

5.4.3 Tebogo: Second year

Tebogo indicated that the loss of his excluded friend, and the subsequent breakdown of a relationship with the other friend, were the main reasons for the difficulties he experienced in his second year. He talked about how the friendships had helped him to stay focused on studying something he did not like:

I just think I needed to stay focused in something that I don’t have a drive for; I needed to have people who were focused on it to keep me focused. Not that I’m other people’s responsibility.... [Tebogo’s interview, p. 30]

Tebogo’s remark about ‘something that I don’t have a drive for’ describes the constrained situation in which he found himself, when pursuing a secondary project rather than his primary one of becoming a pilot. Although he worked with other people, for example, with Ogone in the Material Balances course, he did not find it fruitful, because they ‘were not in the same place’. He believed that things started to ‘really fall apart’, when he tried to focus on ‘other things’ to empower himself. After losing his friendships – and becoming tired of his daily routine of ‘waking up, going to lectures, coming back, eat, work, and sleep’ – he decided to explore social clubs; this decision improved his social life, but it did not translate into academic gains. As a result of failing the Material Balances and another key course in second year chemical engineering, Pumps & Fluids, Tebogo was thus unable to do the core third year chemical engineering courses. This effectively extended his five-year curriculum to six years.

5.5 Students’ deliberations about the third year

5.5.1 Ogone: Third year

Ogone seemed to have encountered many constraining circumstances in his third year. Firstly, he indicated that Tebogo, his study mate in some of the courses in second year, was unable to study with him, as he could not register for several core third year courses. Although Ogone knew more students in the mainstream programme at that stage, he found it

difficult to study with them, as he felt there was a stigma attached to being an ASPECT student:

They are in the mainstream and we're doing ASPECT. I don't know, but the way they look at you – like maybe when you want to study with them – like you are ASPECT, so whatever you say, they don't take it seriously. So it was quite hard. I wanted to study with other people, but it was hard because, if you talk about something and they take it lightly [don't take it seriously], so when it is like that, then you just don't associate with them. [Ogone's interview, p. 28]

Ogone's perception that the mainstream students were looking down upon ASPECT students acted as his second constraint, as it limited his interactions with them; as a result, he decided to study alone, as he had done in first year. There were other ASPECT students who were registered for the same courses, but his previous study relationships with them had not worked. He recalled, for example, an incident in which he had studied with one of them for a class test. He expressed how failing the class test affected his confidence:

I'd failed Mass Transfer [course]; I got 30 something. I think it was only him and me who got such marks. Other students got decent marks like 40 something, even if they failed. Most people passed it. I'd failed it by such marks! So from there it just destroyed my confidence, like everything. So I stopped attending lectures. [Ogone's interview, p. 29]

After failing the test, Ogone decided to stop attending the course lectures, because he knew that with a class test mark of 30 percent, he would not be granted a Duly Performed certificate (DP) to write the final examination; he needed a minimum test mark of at least 40 percent. The fact that the course had a single class test, he remarked, did not help him. At the end of his third year, Ogone passed only two out of the eight courses for which he was registered. Noticing how bad things were, he decided to consult the faculty handbook; it indicated that he could get excluded if he did not acquire sufficient credits. To increase his credits and mediate this constraint, Ogone acted strategically and decided to register for an elective course:

I was like OK, I've failed so many things and there is exclusion. I'd seen it [exclusion] happen to other students. I looked at it [faculty handbook] and saw that if I take an 18-credit elective, then I could make it, because I'd have accumulated 160 credits with ASPECT. So if I added the Word Power course, I knew I could get 160. [Ogone's interview, p. 31]

His decision to register for the Word Power course during the summer term, however, introduced new constraints to his project. Firstly, he did not have the financial resources to pay the approximate amount of R10,000 required for summer term tuition and accommodation costs. Although he was receiving financial aid, after losing his bursary in the second year, the financial aid office declined to pay for the summer term fee:

And financial aid, they said no, they are not going to pay for that. I think they only pay for it [summer term course] if it stops you from graduating. That's when they pay for summer or winter term. So it meant that I had to pay for it. Ja, I had no other choice so I just thought OK, I have to do this. [Ogone's interview, p. 32]

Secondly, Ogone indicated that his family could not afford to pay for him. Upon reflecting on this predicament, he decided to ask to pay the course fee only, which was approximately R3 000. He decided that he would have to 'survive' without accommodation; he would sleep in open buildings on campus.

Ogone was offered accommodation in a nearby suburb by a man from his church; this was based on an understanding that they would study the bible together. However, he pointed out that the man seemed not to understand the significance of what he needed to accomplish during the summer term. The man was thus not happy with him, because he was spending more time on 'other things' instead of studying the bible with him. Ogone helped out with many things in the house; for example, he always washed the dishes and helped to take care of the man's two-year-old toddler. Moreover, he had to help out more when the man travelled to the UK and left him alone at home, with the toddler and the man's heavily pregnant wife. Realising that this environment was not conducive to studying, Ogone decided that he would spend more time on campus and only returned to his accommodation late at night, after studying. He later decided to sleep on campus, so that he could wake up early to study:

At one point, I took off from his place and told him that OK I have to study the whole night because there is a lot of work. Then from then, that's when I started to take my stuff, like

toothbrush, everything and I came to campus and slept in one of those small rooms in the Resource Centre. I worked on Word Power. In the morning I would wake up early and go and brush my teeth. [Ogone's interview, p. 33]

He slept in the Resource Centre in the Chemical Engineering building for several nights, until his student card was disabled. He could no longer access the building at night and thus decided to sleep on middle campus:

So sometimes I would go to the middle campus to the white thing [the 'Summer House', an old open structure] there. And I would just sit there the whole night. It was hard. So if I didn't sleep properly on middle campus, those trees have chairs; so during the day, after the lecture, that's when I would sit there and sleep… I didn't care what people would think. I just took my bag and made it my pillow (he laughs). [Ogone's interview, p. 33]

Having experienced and survived such constraining circumstances, Ogone indicated that the experience toughened him up:

I think after that, that's where my heart just sunk. I don't think much stuff hurt me anymore because of what I went through in that period. [Ogone's interview, p. 33]

He said that, when he did not have the money to pay for the summer term and when he noticed his impending academic exclusion, he had deliberated about leaving his studies; however, he knew that going back home was not going to make things better:

The thought of just leaving it, the thought of exclusion, of being at home… I knew that if I go home, it means I would have to go to another university. It would mean that I don't have funding, so at home they would have to pay, which is impossible. So if I went home, then that's the end. That's what I thought; that I can't afford to just get home. I mean having gone through this, to just leave it at that? I'd owe lots of money from first year, I wonder how much it comes to but I'm sure it is hundreds of thousands. [Ogone's interview, p. 34]

Ogone's statements suggest that he felt completely trapped; he had no alternative but to complete the degree. He passed the Word Power course and was readmitted to fourth year.

5.5.2 Dyllon: Third year

Dyllon reported that, after having been readmitted on appeal, he started to engage more with the ASPECT chemical engineering students. He realised his 'mistakes' from second year and decided to interact with his classmates:

That's when I started working with Ogone more and Tebogo and the other guys. I just spent most of the time with the chemical engineering people. I knew I needed to work in a group on campus, or there was no way I was going to cope. [Dyllon's interview, p. 19]

Although he interacted with other students, he said that his interaction with Ogone was limited because they had few courses in common; he did work with Tebogo in some courses, but Tebogo generally preferred to work by himself. Dyllon passed all the courses in the first semester, but failed Chemistry 2 as a result of his 'slacking' in completing the laboratory reports. At the end of the second semester, he failed three courses; he attributed this to 'a bad exam timetable'. He said that he had to write three course examinations in one week and that, although he prioritised his studying, in the end he failed all three courses. At the end of that year, Dyllon was excluded again because he had not accumulated sufficient credits to proceed. Although he registered for a summer course and passed it, the credits were still insufficient for him to continue. It was the second consecutive year that Dyllon had been excluded and at that point, he seriously considered going to study at the Cape Peninsula University of Technology (CPUT). He said he struggled to get himself to appeal against the exclusion, but a part of him wanted to return to UCT because he had already been there for three years:

I probably did want to come back because I knew I couldn't do otherwise. The thing that was going on in my mind was, you've already been here for three years, so if you go away with nothing, then what... you just wasted three years of your life? You could have been doing something else. [Dyllon's interview, p. 22]

Dyllon's statement suggests that he also found himself trapped by his circumstances; but leaving his studies at UCT appeared not to be an option. He reflected on his future prospects and concluded that a degree from UCT would be invaluable. He thus appealed against his exclusion and was readmitted, after stating that the death of his aunt during the September holidays had negatively affected his studies.

5.5.3 Tebogo: Third year

Tebogo indicated that the third year was as challenging for him as the second year. He attributed the difficulties he experienced to a combination of things that he himself was responsible for and the external circumstances in which he found himself. It seemed that he had experienced many constraints, both at course level and at the institutional level. At the course level, he acknowledged that his poor time management in the examination, together with not sleeping the night before he wrote an examination, contributed to him failing some of the courses. In other courses, however, he cited a 'bad examination paper' as the reason why he failed. For instance, he failed the Thermodynamics 1 course with a mark of 48 percent. He said he found it difficult to accept the mark and decided to follow up on what had happened:

So that one I tried, I wanted to see my script because I didn't feel like I'd failed it. We wrote the exam this Tuesday, and by Thursday of the next week, the marks were to be out and knowing the lecturer and her marking, she is a very slow person in marking basically. So I was confident that they could find something in my script to give me the marks, but clearly there is nothing they could do about it. [Tebogo's interview, p. 36]

Tebogo then paid R150 for his script to be reviewed in the hope that the lecturer would find additional marks to get him to the pass mark. He was unable to have his script reviewed at that time, however; instead, he was informed that the process of reviewing scripts could only take place in March of the following year:

They [the examination office] said I can come and see my script in March. I said, but no, in March I am already registered for other courses, so you are just telling me to take this and go home? So certain simple privileges like somebody allowing you to see your damn script, simple as that, it is my paper. There can be a process for me to see it, maybe let me see in January if you don't want me to see it in November; let me not pay R150 for these people to come and count the ticks that I already have on the paper. So basically they don't look for marks, they just count! [Tebogo's interview, p. 35]

He pointed out that the review process entailed recounting the marks on the script instead of remarking, a process that he believed was unfair to the students. He acknowledged that it was his responsibility to pass, but he felt that the engineering students were disadvantaged by the

fact that they were not allowed to write supplementary examinations; he indicated that the SRC should intervene in this regard:

I feel like if there was something that the SRC could do is to push for people who are doing engineering to also get supp exams… So what does that say about that day that you wrote a bad exam? How can you judge me on that day when I was writing that exam? [Tebogo's interview, p. 35]

Tebogo further compared the EBE faculty with the Health Sciences faculty and indicated that he found it unfair that UCT allowed medical students, whose studies involved decisions on the life and death of people, to write supplementary examinations but the same privilege was not extended to EBE students. At the end of his third year, Tebogo could have been excluded, however, he averted the potential constraint by taking two elective courses, and accumulating more credits during the winter and summer terms.

5.6 Students' deliberations about the fourth year

5.6.1 Ogone: Fourth year

Ogone indicated that, after experiencing great challenges to avoid exclusion in third year, including 'sleeping outside for days', he decided to approach his studies differently in his fourth year. Firstly, he decided to study on campus, as he felt that being alone in his room was demotivating. Secondly, he decided to ignore other students' perceptions of him and to ask them for help, when he needed it; this was something he had previously found uncomfortable:

If I got stuck, I asked people. I didn't think that OK, what will they think?… Last year when I got stuck, I just thought 'what would they think of me'. But this year [fourth] when I got stuck, then I just go and ask someone to help. [Ogone's interview, p. 42]

Thirdly, unlike in previous years, Ogone added that he was no longer concerned about failing because he knew it was a part of life; he felt motivated that, despite failing, he would make it:

And then the other thing was that I knew from last year that failing is part of life. You can't always do well and there are times when you fail and you have to accept and move on. So I said if I could survive last year, I could survive that, if I could stand it, then it means I still have a chance. [Ogone's interview, p. 35]

The fourth and major change in his approach to the fourth year was that Ogone, Dyllon and David (a student in the mainstream programme) formed a study group and kept each other accountable to their commitments. He said the three of them studied together in all the courses they did in common. He indicated that the good thing about working with other people on campus was that he could access the necessary help immediately when he needed it.

Another enabling factor was that he was motivated when Vincent, his friend and mentor in first year, graduated in chemical engineering:

I knew that OK he did it, so can I. So if you see that…I kept that picture with me. I want to see myself also being happy to complete. That motivates me. Before I didn't have that picture. I was just working and I didn't know where I was going or what was going to happen, I was just working. But now I know that at least I also want to feel the way Vincent felt. I want to experience that. So that's also something that keeps me going. [Ogone's interview, p. 35]

Although he acknowledged that he had experienced some constraints in his fourth year, he believed that 'doing things differently' helped him to cope. Some of the constraints he mentioned included having experienced an unfavourable examination timetable. His examination timetable at the end of the second semester, for example, was such that he had four examinations in three days; two of the examinations were written on the same day. Moreover, three of the examinations were for key chemical engineering courses. He said that, although he approached the programme convenor to report his predicament, nothing came out of it because he was told that 'there is not much he can do about it'. He echoed his frustration about the examination timetable:

After writing an exam today, tomorrow you are writing two. You need that energy to study for the fourth exam. So you fail even the easier stuff because you have not studied them properly. [Ogone's interview, p. 38]

Although Ogone found fourth year challenging, he commented that he felt more positive about the outcomes. His journey had been marked with timetable clashes, challenging examination timetables, concessions and appeals, but he was hopeful that he would eventually finish his studies.

5.6.2 Dyllon: Fourth year

After being excluded from the university for two consecutive years, Dyllon reflected that his fourth year had been much better. Similar to Ogone, he indicated that the biggest change in his approach was when he formed a study group with Ogone and David. He explained that Ogone was always motivated and 'pushy' and that this helped him and David to remain motivated, even when they 'did not feel like it'. Dyllon admitted that he felt the study group benefited him the most, because for the first time in years, he did not have to do everything by himself. He could access the help from his mates when he got stuck:

Ja, you can go to someone and say listen here I don't understand this, can you just explain to me, whereas when you are sitting at home and you get frustrated when you can't do something… So then in a group, I can just go to Ogone and David when we are working together and I can just ask. [Dyllon's interview, p. 24]

Dyllon was the only one of the three who commuted daily from home to campus. His attempt to leave home and move into a flat closer to campus in third year lasted for only one semester. He admitted that he was unable to cope with washing his clothes and cooking for himself and thus decided to move back in with his parents. Thus, although moving to a flat closer to campus reduced his daily commute, which meant that he could spend more time on campus, he chose to return to the familiar home environment.

With regard to the constraints he faced in his fourth year, Dyllon indicated that he had experienced an unfavourable examination timetable. At the end of the year, he wrote seven examinations; four of these were in four days, and three written over two days. He explained how he managed to navigate this constraining situation:

I didn't sleep (he laughs). For the Separation Processes course, I was quite on top of it. I studied Separation Processes and Thermodynamics 1 together in the afternoons. I did that for the first 2 weeks. And in between I was putting Physics 1 and Solids a bit on the weekend. PCS [Professional Communication Studies] I really did it the day before the exam. So that's how I did it, I tried to know what I know for sure and make sure that I understand it well…. [Dyllon's interview, p. 30]

In the advanced stages of his studies, Dyllon was still carrying the first year course, Physics 1. He clarified that his ASPECT chemical engineering curriculum allowed him to do Physics 1 only in second year. However, his timetable became 'complicated' when he failed the course and had to delay it until the fourth year. Being in the fourth year made it difficult for him to give sufficient attention to this first year course.

At the end of the interview, Dyllon spoke with great concern about the experiences of being a student in the chemical engineering department. He said that the department 'don't take students who are not final year students seriously', and that 'everyone else is just a number'. He elaborated on this by stating that lecturers were inconsiderate towards students' workload and expected them to 'just get on with it'. He said that when students complained to the Head of the Department, no action was taken:

This current class has complained to the HoD numerous times about lectures and about our inability to write programmes in 3rd and 4th year, and he's done nothing about it. So it is just like you are just complaining.... [Dyllon's interview, p. 28]

In addition to the constraints experienced by all the students in the programme, Dyllon explained that the ASPECT students experienced further challenges in the department:

If you are from ASPECT, it is like you really don't get accepted into chemeng. I don't even think that they see you as important as a normal chemeng student. But then ASPECT is a good programme, but it's just that the chemeng department just kick us out from the word go. There is just a constant upward battle to just get to be recognised as a normal chemeng student. [Dyllon's interview, p. 29]

Furthermore, according to Dyllon, some of the lecturers in the department had a different attitude towards ASPECT students:

If they hear you are ASPECT, they just have a different kind of attitude to you than they would to any normal mainstream student. That's how I feel. I just think they look past you and they just go on with it. [Dyllon's interview, p. 35]

Another constraint for ASPECT students, he added, was that they could not be class representatives:

If you're from ASPECT, then you cannot be in a class rep position because you are not doing all the subjects in that year. You are neither in second year or whatever year, so in that way, when there are timetable complaints and ASPECT students tell them [class reps] [that] they have a clash, the class reps do not pick up the clash unless ASPECT students speak to them. But then the class reps say no because the clash affects such few people in such a huge class. So just deal with it. Like you don't have an ASPECT class rep that represents the interests of ASPECT students. [Dyllon's interview, p. 35]

Lastly, Dyllon indicated that, although the fourth year had been better than the two previous years, he was looking forward to finishing the degree and working. Given the attitudes he had encountered in the department, he would not consider coming back for postgraduate studies:

It will be hard for me to come back and do masters from the attitude that I've got here. And then if I do come back, it will not be in this department. [Dyllon's interview, p. 35]

5.6.3 Tebogo: Fourth year

Tebogo echoed some of the constraining circumstances that Ogone and Dyllon raised, and elaborated on others. For example, he emphasised the pressure placed on students by courses that had just one class test. He gave an example of one such course, Reactor Design; he had failed the class test so terribly that he was not granted DP. He said the experience left him 'defeated for a while'. Tebogo also highlighted some things that he believed were 'inappropriate' about the course. For example, he indicated that the course DP list was released the day before the examination, something he found unfair, as it meant that many students studied for the examination they were not allowed to write.

He shared some of his experiences as a chemical engineering student and echoed Dyllon's sentiments of being the 'best or nothing' in the department:

The chemeng department is basically where anybody who comes in is supposed to be best or nothing. It is like there is no middle…. [Tebogo's interview, p. 23]

With regard to the broader issues that affect the EBE students, Tebogo felt that the EBE student council lacked the will to promote the students' interests in the university. He believed, for example, that the council was not proactive enough to 'fight for supplementary examinations'. He felt strongly about this issue and indicated that was 'tired of complaining'

and that he would start acting. He planned to join the council so that he could raise the 'real issues' that affected engineering students.

At the end of his fourth year, Tebogo still felt strongly about his dream of becoming a commercial pilot. He indicated that, throughout his undergraduate studies in chemical engineering, he had continued to seek various avenues to get into flight school; this included applying to the Air Force and to the South African Airways (SAA) programme. He intended to keep trying until he reached the age of 28, and that he would abandon his studies in chemical engineering if he was accepted and received funding for flight school:

I'd rather have the training, knowing that I still have a chance to be a pilot at some point, whether I start that at 28 and 29. At least I would have done it because I only live once. Whatever it is that I must do to get to fly, I just want to do it. I want to have my dream before I die. So before I die, I want to tell someone to clear that runway for me. That's just one thing that I want to do. [Tebogo's interview, p. 50]

5.7 Conclusion: Modes of reflexivity

This chapter described the journeys of three chemical engineering students, as they made their way from first year to fourth year (T^2-T^3). The students' backgrounds were briefly described, which was followed by a discussion of their ultimate concerns and projects. It appeared that, although the three students had the same project of completing the chemical engineering degree, they all had different ultimate concerns, which they intended to (fallibly) realise. Whilst Ogone pursued the degree in the belief that it would provide him with the financial resources he needed to realise his ultimate concern of 'being happy', Dyllon envisaged the degree as a way to enable him to realise his dream of living a 'comfortable lifestyle'. Although a chemical engineering degree was a secondary project to Tebogo, he too hoped that, by completing it, he would be able to save money and afford to pay for flight school.

With regard to each student's modes of reflexivity, Ogone's dominant mode while at university appeared to be autonomous reflexivity. He demonstrated independent thought and the ability to complete his complete his deliberations and decide on courses of action. Although his decisions did not always yield the desired results, for example, when he failed the Reactor Design course test and stopped attending lectures, he demonstrated an ability to

take strategic action to deal with constraints, when he registered for an elective course and made sacrifices, including sleeping in buildings on campus, to ensure that he passed it. Upon realising that the approach to his studies was not yielding the desired outcomes, he decided to leave his comfort zone and formed a study group with other students; previously uncomfortable with this approach, it however improved his academic circumstances. He decision to ignore people's thoughts about him enabled him to seek help from others and helped him to improve his performance in his fourth year.

Dyllon's dominant mode appeared to be communicative reflexivity. This was demonstrated by his emphasis on the role of friends in supporting his course, suggesting that he was an 'identifier' and sought others to help him complete his deliberations. Starting in his first year, Dyllon made friends with some local coloured students with whom he could identify. He later realised that these particular friendships were less helpful in completing his deliberations in his second year; this proved to be problematic, as he was unable to make decision that led him to successful outcomes. Furthermore, Dyllon's decision to move back in with his parents, even when staying in a flat closer to campus would have enabled him to have better access to resources and to his peers on campus, suggested that he was unable to leave the familiar home environment successfully. Lastly, the fact that Dyllon reported that the fourth year was his most successful year, largely as a result of the study group that he, Ogone and David had formed, suggests that he coped best when he had others to help him complete his deliberations.

Tebogo's dominant mode while at university appeared to be fractured reflexivity. When he started his studies, chemical engineering was a secondary project, which he found difficult to pursue successfully. Although he demonstrated his ability to work independently and complete his deliberations, which suggests that he was previously an autonomous reflexive, his inability to focus on the current project and the constant desire to abandon chemical engineering for pilot training indicated that he was unable to invest himself fully in his current course of study. He appeared to have lost focus and interest in his project when he lost the support of his friends from first year and since then he had been struggling to overcome the constraints he encountered. Tebogo was uncertain about how he would proceed with the current project and indicated that he would abandon it, as soon as his pilot training plan materialised.

A further analysis of students' modes of reflexivity is presented in Chapter 9. The next chapter describes the journeys of civil engineering students.

Chapter 6 - Civil engineering students

Chapter 5 presented the results for the T^2-T^3 stage of the morphogenetic cycle for the three chemical engineering students who participated in this study. This chapter focuses on the T^2-T^3 stage for three civil engineering students, as they made their way through first year to fourth year, using a similar analytical structure to the previous chapter: The chapter begins with brief introductions of the students' backgrounds, which accounts for the emergence of their primary agency. This is followed by a description of the students' concerns and projects. The subsequent sections describe students' deliberations about the constraints and enablements they encountered, as they made their way through each academic year.

6.1 Students' backgrounds

6.1.1 Nombulelo's background

Nombulelo grew up in Kwamashu, a township outside Durban in KwaZulu-Natal (KZN). She was the only child born of her parents, who were never married. She explained that, although she knew her father, they never spent enough time getting to know each other; he died when she was just ten years old. She grew up in a family of four: herself, her mother, aunt and cousin. Her mother, a nurse, left her in the care of her aunt, who was unemployed, when she went to work. Her aunt taught her 'everything there was to know about being a growing up girl'. When she was 16 years old, her mother married her stepfather and they relocated to a 'better' section of Kwamashu.

She described Kwamashu as a township that had 'many sections', which were divided according to socio-economic status. Furthermore, she described her community as being marked by high alcohol abuse and teenage pregnancy; she said that she deliberately distanced herself from such activities, as she believed that there was more to life. She added that many young people did not attend school, and she believed this was because they lacked the drive to pursue a better life.

In search of better education opportunities, Nombulelo commuted to a Model C high school outside Kwamashu. She said that, although the school had previously been a white school, the majority of the students during her years there were black. She praised the quality of the teachers at the school and claimed that it had some of the 'best teachers in the country'. She moreover enjoyed a 'close' relationship with the career guidance teacher, who was her main

source of information and thus influenced her decision to study engineering. Given her desire to work outdoors, she decided to apply for civil engineering, which she described as 'the most outdoor, practical and visually appealing' of the engineering disciplines.

She applied to UCT and the University of KwaZulu-Natal (UKZN); at both institutions, her first and second career choices were civil engineering and accounting respectively. UKZN offered her a place to study both civil engineering and accounting; however, they only offered her funding for accounting. UCT accepted her to study civil engineering through the ASPECT programme. There were three potential constraints about her acceptance at UCT: Firstly, she explained that although she wanted to choose UCT over UKZN, stating that UCT was the best university in the country, she did not like the idea of studying for five years (as a result of participating in the ASPECT programme). Secondly, she was worried that, after much effort on her part to apply to various companies for funding, she had not yet secured a bursary; however, this potential constraint was overcome when the Study Trust offered her the bursary she needed. Thirdly, she was initially not offered accommodation at UCT and, considering that she was moving to Cape Town, over 1,600 kilometres away from her home, she was worried that this would affect her studies negatively. She indicated that she was fortunate to be offered transit accommodation. She thus decided to accept UCT's offer, although this decision entailed a significant contextual discontinuity away from her natal context.

6.1.2 Thando's background

Thando was the second of three children. He lived with both of his parents until they divorced when he was seven years old. After the divorce, he and his elder sister went to live with his grandparents. Thando did not talk about his father beyond this point; he did, however, talk about the pain he felt when he could not see his mother daily. She could only see them about twice a week after work.

He was born and grew up in Soweto, which he described as 'a very big township with many different types of people living there'. He explained that, because people of many cultural and language backgrounds resided in Soweto, most of its residents were multilingual. He further said that it was difficult to describe Soweto's socio-economic status accurately, as some areas were 'developed', while others were 'underdeveloped'.

Thando described his high school, a DET school, as one of the best public schools in Soweto and said that many learners aspired to attend it. He explained that, because the school upheld 'high standards' and had a 'high calibre' of students, many companies offered enrichment programmes to the learners at the school. He benefited from one such programme, which afforded him an opportunity to attend Star Saturday school. He said that attending the Saturday school, which was held at Wits University campus, also enabled him to attend career fairs at the institution and exposed him to the university environment. The exposure and experience he gained from attending various career fairs helped him to decide to study engineering. In particular, he wanted to study either metallurgy or mining engineering, but he had heard about chemical engineering from his elder sister, who had once applied to study it, but could not secure funding to pursue it.

While in his final year of high school, Thando applied to Wits and UCT. At Wits, he applied for metallurgy and mining engineering as his first and second choices respectively. When he realised that UCT did not offer metallurgy and mining engineering, he applied for chemical engineering and civil engineering respectively. He said that, although Wits had accepted him for metallurgy, he was unable to accept their offer due to two potential constraints: Firstly, Wits had not responded to his application for financial aid and he was thus unsure of whether he would receive funding. Secondly, Wits required a mandatory R5,000 registration fee, which he could not afford to pay. Unlike Wits, UCT responded quickly, and offered him the financial aid he needed, and he was not required to pay a registration fee. Although the financial circumstances at UCT were more enabling than they had been for Wits, he was only accepted for his second choice, civil engineering, and only through the ASPECT programme. He said that he was 'OK with it [civil engineering]' because he had been informed that he could change to chemical engineering in his second year, a switch he later understood to be 'nearly impossible'. With regard to his acceptance to ASPECT, he initially felt that the extra year was going to be 'a waste of time', but his mother encouraged him to do it.

Thando described his journey to Cape Town, a city over 1,400 kilometres from his natal context, and his arrival at UCT as 'positive'. Firstly, he had a friend who had also been accepted at UCT; they booked the same flight and travelled together. Secondly, upon his arrival at his residence, he recognised some familiar faces of students he had met at the Saturday school and he said that this enabled him to feel comfortable. However, his experience at the first ASPECT meeting made him ask himself questions, such as 'why is it only black

people here? Is it because we are black and maybe from disadvantaged backgrounds that maybe they think we don't have the capability to enter the mainstream programme?' He said that the he found the racial mixture of the ASPECT class 'depressing'; it made him feel that his thinking capacity was 'not sharp'.

6.1.3 Eric's background

Eric was the second born of three children. His family was originally from Kenya; they relocated to Cape Town when he was ten years old. His mother was a teacher and his father was a businessman. His elder sister studied at Varsity College and his younger brother was studying towards a BComm degree at UCT. When the family relocated to South Africa, they first lived in Langa township, where they rented a backroom. He said that, when they lived in Langa, they felt like outsiders, because their parents were very protective and did not let them walk about in the streets, as they perceived the area to be unsafe. Eric and his family did not speak the Xhosa language that was spoken in Langa and he felt this was the main reason why he was unable to communicate with the children in the community and thus felt like an outsider. The family eventually relocated from Langa to the more culturally and linguistically diverse suburb of Gardens near the city centre, a move that he felt had 'robbed' him of the opportunity to have the kind of 'African experience' he wished for.

Eric attended a former House of Representative (HoRep) high school close to his home in Gardens; he described the learners at the school as predominantly coloured and Muslim. He mentioned that many learners engaged in 'mischievous' activities, such as smoking and drinking. He was not immune to such activities; he admitted to having defied his parents and 'tried them out', before realising that he did not enjoy them.

With regard to studying further, it had always been Eric's dream to study at UCT, though he was less concerned about what exactly he would study. He said that his decision to study engineering was influenced by two factors: Firstly, he wanted to study something for which he was likely to receive funding; as he was not a South African, Eric could not apply for financial aid. Secondly, he applied to engineering because his parents perceived it as a worthwhile career for a man.

He applied to UCT and chose civil engineering and accounting as his first and second choices respectively. However, he was dismayed to find that his final grade 12 marks were not good

enough to get him into the mainstream programme. He was advised to talk to the ASPECT coordinator, after which he was offered a place in the programme. He indicated that, although he realised that ASPECT was his only route to studying engineering at UCT, he did not like the idea of taking five years, stating that he was very eager to complete his studies. Eric was also offered a place at a UCT residence, which he acknowledged as an enablement, considering that the commuting distance from his home to UCT was 10 kilometres.

6.2 Students' concerns and projects

Nombulelo indicated that she had always dreamt of building a bigger house and providing a better life for her family. In addition, she loved helping people and wanted to add value to her community and her country. Her ultimate concerns were thus articulated as 'seeking a better life' and 'adding value'. Her project was to obtain an engineering degree, in the belief that it would help her to realise her concerns:

Once you get an engineering degree, many companies are interested in you… So I just want to get the skills that will make my country progress. I know that people tend to study and once they finish, they tend to leave because they have just lost hope in Africa, particularly when you look at South Africa and the way things are going right now. So I want to use my skills to actually make a difference. [Nombulelo's interview, p. 17]

Thando's ultimate concern was to lead 'a good, perfect and successful life', which he described as follows:

From my [family] background the good life would include a good family life. A good family life will mean having a good job, a good paying job. [Thando's interview, p. 8]

With regard to 'the good life', he emphasised the importance of keeping a balance between family, friends and a career. Moreover, 'a good job' must afford him the opportunity to have a positive impact on other people's lives. His project was thus to pursue an engineering degree in the hope that it would help him to have a successful life and enable him to have a positive impact on other people's lives.

One reason I thought of going to engineering was that they told me that you work with people and you help people; you work with communities to solve problems and you do it for the

people. So I thought it is a good degree because I also want to make a difference, so I went for engineering. [Thando's interview, p. 8]

Like Nombulelo and Thando, Eric's ultimate concern entailed leading 'a good life', and he believed that completing a degree at UCT was the best way in which he could achieve this:

I wanted a good life and somehow a good life to me seemed like I had to go through varsity. So that was the one reason for me. Secondly, my parents always spoke about UCT like it was heaven (laughs), and that was where they always wanted us to end up. [Eric's interview, p. 8]

Apart from wanting a good life, Eric's other concern was to make his parents proud. He said that, after he had been troublesome in his teenage years, he wanted to show them that 'something can come out of nothing'. His project was articulated as obtaining a degree from UCT.

6.3 Students' deliberations about the first year

6.3.1 Nombulelo: First year

Nombulelo had not been offered a room at a residence and thus stayed at the university transit accommodation. She said although it was a challenge at first to share a room with five other girls, the arrangement enabled her to meet and make friends easily and that the friends she made during that time were still her friends. On the contrary, she indicated that she found it difficult to relate and make friends with students in ASPECT, stating two reasons for this. Firstly, she said the fact that she 'hated the idea' of being in the programme, specifically because she thought she had met the minimum requirements for the mainstream programme, affected how she related to ASPECT students in general. Secondly, she indicated that she was not 'a work in a group' person and as such, she struggled to interact with other students in the programme. She did however refer to one friend with whom she was close; they had met in transit accommodation and later realised that they were both in ASPECT. She expressed deep sadness that her friend died in a tragic car accident at the end of second year.

With regard to her studies, Nombulelo identified two constraints to her project. Firstly, upon struggling to learn the computer programs in the CivEng 1 course and seeing some mainstream students 'getting the hang of things' easily, she felt that her school had not prepared her adequately. She said that, although the EBE faculty ran a computer competency

course at the beginning of first year, it did not prepare students for the specific programs required in CivEng 1 course:

They don't really have those special computer programs in the computer competency course. I think that makes you not perform [in the course] because within a week you are expected to understand that [computer] program.... [Nombulelo's interview, p. 29]

She felt that lecturers spent limited time teaching the computer programs and that she found it unfair that the students were expected to master the programmes without extra support:

They'd dedicate one day where the lecturer demonstrates how to use it and for me, I felt that wasn't enough, that one day was not enough. Maybe they should have said that for those who still don't understand they would offer extra classes. [Nombulelo's interview, p. 29]

The second constraint was that Nombulelo felt undermined by mainstream students in the CivEng 1 course; she felt that they disregarded her input and made her feel stupid:

There was a lot of undermining where you'll say something and they'll be like OK, let's continue; it doesn't really matter what you say. I guess that will make you feel stupid because I remember I felt stupid. I used to hate the group work; I hated it because when you're brainstorming, and the whole idea of brainstorming is not to say your idea is the best. But she writes down all the ideas that everybody has said and it was as if they just shut down my ideas and like OK, you are in ASPECT, remember? Well, they didn't say that, but that's what it felt like. I felt excluded. [Nombulelo's interview, p.28]

Nombulelo's remarks suggest that being labelled 'ASPECT' was constraining, as it positioned her unfavourably in her group. However, there were some enabling experiences in the courses she did in ASPECT. For example, she noted that, although the Mathematics 1 and the Physics 1 courses were challenging and required her to apply herself more than had been necessary in high school, she was able to manage them, because of the constant assessments and feedback from the ASPECT staff. At the end of her first year, Nombulelo passed all her courses with marks ranging from 60 to 73 percent.

6.3.2 Thando: First year

Thando explained that, before he came to UCT, he had met people who had already warned him about the demands of university studies and about the kinds of friends one kept while at university. Thando took these warnings seriously and decided that he would avoid making friends with students who were not studying engineering. He rationalised this by telling himself that students in different fields of study required different study times, and that he was not prepared to compromise his study time for friends who would not understand the demands of engineering studies:

So that's when it became important to choose friends. Some people are doing engineering and some are doing humanities. Those doing humanities tend to do other things more than you. So when you try to study, they might come and disturb [you]. Such things can be a bit of a problem for us [engineering students]. [Thando's interview, p. 22]

Nonetheless, although he was studying civil engineering, Thando became friends with mechanical engineering students in the ASPECT class; he said that this was partly because there were more mechanical engineering students in the class than civil engineering students, of whom there were only a few. He said that he was not concerned about not having friends who studied civil engineering, as he generally preferred to study independently.

With regard to his studies, Thando stated that the CivEng 1 course was 'the most interesting course' in his first year. However, he then raised the same constraints that Nombulelo had mentioned about the group dynamics in the course, stating that working with students of different races resulted in the white mainstream students undermining the ASPECT students:

Most of the mainstream students are white; they undermine your ability to do things or they question how you do things. I think if they didn't know that I was from ASPECT, they wouldn't. We changed groups in every project; some groups were just black and with other mainstream Black students and things were normal. But the problem is that the white students will question you… That is the only thing that really bothered me, that because I am from ASPECT, I am questioned. [Thando's interview, p.32]

It might well have been the case that the majority of the students in the class were white, which could have exacerbated his sense that they were taking over. In contrast to his

experience of the CivEng 1 course, he described his experience in Mathematics 1 and Physics 1 (both of which were ASPECT courses) as positive: he found that the ASPECT lecturers made themselves available for students, unlike the lecturers in the mainstream programme:

The nice thing about ASPECT is that you would sit there and the lecturer would explain in every way, until you would understand. And you were allowed to go and consult anytime, and he would sit down with you and explain. So that was the nice thing about ASPECT, that you were given enough support. [Thando's interview, p. 22]

At the end of his first year, however, Thando found himself in a potentially constraining situation, when he failed the Mathematics 1 course. Although he was granted an opportunity to write a supplementary examination, he had already left for home when he received the results and thus could not access his books to prepare for it. Upon deliberating on his situation, Thando decided to borrow a mathematics textbook from his neighbour, who was a first year engineering student at Wits. He also downloaded course material from the course website. He said that, when he returned to UCT for the supplementary examination, the ASPECT lecturers were already available to consult with students. He passed the supplementary examination, which enabled him to proceed to second year.

6.3.3 Eric: First year

Eric was happy that moving out of his parents' home would enable him to redefine himself from 'the shy guy' he had been in high school and help him to get out of his 'social rut'. He was also happy to have a personal space at last, something that his parents could not afford to provide for him at home. He said that he made the best of orientation week, including attending parties every night, and consequently he made many friends during that period. He did not limit himself to friendships with engineering students; however, like Nombulelo, he did not make friends with ASPECT students, stating that, although he understood the reasons why he was in ASPECT, he did not identify with it.

Eric mentioned several constraints and frustrations about being in ASPECT. Firstly, he felt that the fragmented curriculum disadvantaged ASPECT students and gave the mainstream students 'an edge' because of some concepts that they learned and that ASPECT students had not learned. For example, he cited the concept of significant figures; mainstream students had

already learned about the concept in chemistry, whereas ASPECT students had not yet learned about it:

For example, we'd be expected to know significant figures, which is a topic that a lot of people struggled with. To them [mainstream students], it is a small thing but to us [ASPECT students], we didn't know how to do them. We didn't understand it because we weren't taught them until we did chemistry in second year, and the mainstream students did it in first year. So it was small things like that, but it affected me because my marks went down clearly because of things like significant figures. [Eric's interview, p. 28]

Secondly, Eric felt that the mainstream departments treated ASPECT students as if they were 'handicapped'. For example, he said that in the Physics 1 practical, ASPECT students were separated from the mainstream students and given their 'own little practical day', which he did not appreciate. Although some of the students in this study were happy that ASPECT students were allowed to do their separate physics practical, Eric found the separation to be an 'insult':

We [I] felt like that was an insult, we didn't want that. It became so bad that they said, instead of doing your practical and handing in on the day, you get the whole weekend to hand in your practical. Again I saw that as in insult. For me, I didn't like it. [Eric's interview, p. 27]

Eric seemed to be critical of the very interventions and allowances that other students perceived as advantages of being in ASPECT. For example, although some students in this study indicated that the workload in first year had enabled them to adjust to university, he believed that it helped him to 'cultivate laziness' because he knew that he could catch up with the work even when he fell behind. He later said that his 'laziness' caught up with him and negatively affected his marks.

Thirdly, Eric criticized the relationship between ASPECT and mainstream departments when it came to what was best for the students. He referred to a particular incident in first year, in which the ASPECT chemical engineering students had a difficult examination timetable; this happened to be the incident that Tebogo had referred to earlier: Eric explained that, owing to the disagreements between ASPECT and the chemical engineering department, the ASPECT students were adversely affected by the examination timetable. The situation thus

discouraged him, as it indicated a lack of regard for the best interests of ASPECT students. Despite his frustrations about the programme and the challenges of the examination timetable, Eric passed all his courses with marks ranging between 63 and 84 percent.

6.4 Students' deliberations about the second year

6.4.1 Nombulelo: Second year

Nombulelo reported that the second year was her most difficult year. Upon reflecting on the reasons, she firstly explained that in the first year of the ASPECT programme, all her courses were whole-year courses, and she thus struggled to adjust to the time-pressured demands of semester courses.

But I didn't realise that my courses were [now] semester courses and that you don't really have time to fool around with semester courses. [Nombulelo's interview, p. 35]

She acknowledged that her 'chilled spirit' during the first semester prevented her from treating the semester courses with the urgency they required and, as result, she allowed the work to 'pile up':

I learned the hard way that, as people normally say, when you have free time, just read over some of what you did in class today. I said, no I understood in class, I don't need to go read over that. It started to pile up (we both laugh at her) until it was time for tests. [Nombulelo's interview, p. 18]

Allowing the work to pile up became a constraint later in the semester; she indicated that she found it very difficult to prepare adequately for tests, and later for examinations, and thus failed.

Secondly, she believed that the reason why she found the second year challenging was that, like the first year, she continued to study by herself rather than seeking help from other students:

I always preferred to work as an individual. And then I carried that in my first year and it seemed to work perfectly. So I thought I could carry that tactic of studying the way I used to study in my second year. But I guess I didn't realise that I had to make changes to how I

study, where I needed to try and involve group discussions because that actually saves time with others. [Nombulelo's interview, p. 19]

Nombulelo revealed that, upon deliberating on her poor performance at the end of the first semester, she decided that she no longer wanted to study engineering. She intended to change to accounting in the commerce faculty, stating her reason for change as not wanting to be a failure:

For me, I guess it's because I am a perfectionist, so when I see failure, I get crushed and I don't waste time; my first instinct is to go do something where I can actually be perfect at it. [Nombulelo's interview, p. 17]

She approached the career office for guidance and was advised to continue with engineering until the end of that year, before changing to another faculty. During the second semester, however, she spoke with several senior civil engineering students who shared their experiences with her and helped her to realise that the challenges were part of the journey. She said it was then that she realised that her struggles were not unique and that she was encouraged not to give up her studies in engineering.

At the end of the year, she had failed four of the eight courses, but because ASPECT students had different requirements for readmission, she was able to avoid exclusion; she said it was then that she appreciated the 'whole ASPECT thing' that 'saved' her. She explained that, until that point, she had never failed anything in her life and she did not know how she would have coped with exclusion. Thus she was grateful that the ASPECT programme had enabled her to proceed with her project.

6.4.2 Thando: Second year

Thando also regarded his second year as his most difficult year. Upon deliberating on the reasons, he identified two constraints. Firstly, he stated that he was 'shocked' by the sudden lack of support in the mainstream programme compared to the level of support he had received during his first year in ASPECT. Secondly, he indicated that he struggled with the increased number of courses, most of which covered completely new content. He found the courses generally challenging and, although he tried to keep up with all of them at the same time, he was unsuccessful:

Trying to make sure that all the courses are pushed the same amount, but you find out that there are some that you need to pay more attention to. And time management again, it was maybe one thing, which let me down. [Thando's interview, p. 18]

At the end of the first semester, when he reflected on his poor performance, he started to ask himself questions:

You're first thinking, OK, now it's first semester, is there a chance for me to come back next year? And you think now there is a bursary and money involved. And you are thinking that you are in one of those higher education institutions (UCT, you know). Even [in] your social life back home, people know that you are at UCT. Wow you were this brilliant guy, but now they find out that you've failed and then they will ask questions. There is also family depending on you: We're trusting in you and we think you will make a difference but now you are failing just in second year...[Thando's interview, p. 19]

Thando deliberated on his situation and decided that his only option was to motivate himself to do better in the second semester. He added that, in retrospect, his failure in the first semester was 'a good thing':

I think it was a good thing that I failed in the first semester because I was able to push myself more; I know my potential, I can do better than I did. That's when I said OK, I failed but I have to do it better. I will not let myself and other people down. So me not getting it right the first time encouraged me to try more. [Thando's interview, p. 20]

To motivate himself, Thando drew on the knowledge that he was capable of succeeding, even though things were not going his way at that time. In order to improve his situation, he decided to use the June break to prepare himself for the second semester:

That's when I learned that the June vac was too long. That's when I tried getting resources from other people who went before me and tried to have some ideas of what I will be up to in the second semester. They told me that I can reduce the workload for the second semester if I prepared for it. [Thando's interview, p. 20]

Thando's strategic action in preparing for the second semester enabled him to avoid similar challenges as those he had encountered in the first semester. As a result, he felt more

prepared and thus coped better in the second semester courses. At the end of the year, he had passed seven out of nine courses and was able to proceed to third year.

6.4.3 Eric: Second year

Eric indicated that, although he did not find it difficult to adjust to second year, the 'laziness' he felt was cultivated in the first year of ASPECT persisted in the second year. He said that, even though he was aware of the increased workload, he continued to 'shelve' the work until it was time for tests. However, he was unable to catch up as easily as he had done in first year and, as a result, he failed tests. Ironically, though, failing the tests did not encourage him to work harder; instead, he continued to pretend that everything was progressing well. He explained that the fact that he had passed all the courses at the end of the first semester fuelled his desire to appear to his mates as someone who 'passed without much effort'. He said it was important for him to brag to others and to make things appear easier than they were:

I used to be like 'come guys, this stuff is easy'; I'd brag about it and it became me. It started to define me, that Eric is the guy who put minimum effort into his work, yet somehow passes… It is just that I told people that I was not putting in much effort, to the point where I actually started believing that I didn't put in effort; I actually started not to put in much effort. [Eric's interview, p. 22]

It later emerged that Eric's need to appear as though he was not working hard – and not needing to work hard to do well academically – was influenced by his experiences in high school. He explained that in high school other learners used to refer to him as a 'nerd' and he said he did not want to appear as such at UCT. Although he managed to pass all his courses in second year, he acknowledged that he could have performed better, if he had put more effort into his courses.

6.5 Students' deliberations about the third year

6.5.1 Nombulelo: Third year

Nombulelo indicated that her third year had been better than her second year, after she had reflected on and changed her approach to her studies:

I reflected on how I'd actually been performing throughout second year. I reflected on my study strategies. I realised that clearly they were not working; I tried in the first semester and it didn't work. But I was still stubborn enough to try it in the second semester and it still didn't work (laughs). So I knew that I am choosing to continue, but in choosing to continue, I must be willing to open up and be willing to change…. [Nombulelo's interview, p. 26]

She decided to make two main changes that she believed enabled her to succeed. Firstly, she decided that, instead of 'doing everything' by herself, she would start to study with other students. She said that she found it helpful, as she was able to resolve problems quickly. She added that working with other students also enabled her to realise that they experienced similar challenges, and as such, hers were not unique. Secondly, she decided to start approaching top performers in all her courses and asked for help when she got stuck, although this decision took her out of her comfort zone. She mentioned that the top performers were often students of other race groups but that she had to look beyond people of her race to seek the help she needed to succeed.

Although she described her overall experience of third year as 'positive', she alluded to several constraining circumstances: Firstly, the examination timetables were a 'big problem'. Once the civil engineering provisional examination timetable had been published, Nombulelo knew that the chances of it being changed were very slim; as a result, she often found herself writing three examinations in three consecutive days. She said that she felt helpless because most of the time class representatives were unable to get the timetable changed:

Like from my experience, class reps have tried to change them so that maybe we have a day in between all the exams; they never change basically. So it's more like OK, this is how it is, you have to find a way to deal with it and cope. It just never changes; the system is never really willing to change. [Nombulelo's interview, p. 27]

Secondly, she indicated that, owing to their small number compared to mainstream students, ASPECT students were often more affected by the unfavourable examination timetables, as it was mostly set to suit the majority:

You'll find that even in class, there are 8 ASPECT students, and the rest are mainstream students; they will be like, there are 8 students who want the timetable to change and there are 28 who are happy with it. So if you weigh that out the majority is 28, so we can't change it. So I don't think they take us into account. I don't think the mainstream programme tries to accommodate the ASPECT students.... [Nombulelo's interview, p. 27]

At the end of her third year, Nombulelo had passed nine out of the ten courses for which she was registered. Although she was unhappy that she had failed a course, she was nonetheless happy to proceed to fourth year and feeling confident about her ability to succeed.

6.5.2 Thando: Third year

Thando indicated that, although he was happy to be in his third year, the fact that he had failed two courses in second year introduced some constraints to his project. Firstly, he reported that failing complicated his already fragmented ASPECT curriculum:

For example, I did the Drawing course last year and I left it when I entered the second semester because there was problems with my timetable in the second semester. I thought if I continued with Drawing, it would cause some clashes with tutorials, but most of the time, if you failed one course, it messed up your programme. [Thando's interview, p. 27]

Secondly, the complicated curriculum exacerbated the unfavourable examination timetables to which Nombulelo had alluded. He believed that the examination timetables, which did not give him time to rest between the examinations, subsequently led him to fail one of the courses:

The Structures 1 course is one of the courses that I knew how to do, I prepared for it. When I go to an exam, I make sure that I prepare very well. But it is one of those incidents where you couldn't get enough rest and then you go to the exam, you check the paper, you know what to do, but you can't recall how to do it and it is just not coming, even if you know the concept, [because] you didn't have enough rest. [Thando's interview, p. 25]

He explained that he could not get 'enough rest' before the Structures 1 course examination because he was writing five examinations that week:

They'd put one at 8am today, 12pm tomorrow, 5pm the following day. So sometimes you are thinking 'I can't prepare for the last exam, I must focus on this one that I'm going to write very soon'. [Thando's interview, p.25]

Thando further explained that he could not have started preparing for his examinations earlier, as he was writing class tests the week before the examinations. Under what seemed to be constrained circumstances, he indicated that he had to 'gamble' to cope with the demands:

For courses that were so close to each other it was like a gamble, which ones I can leave and what the costs and effects of leaving them would be. I also had to look at what will happen if other courses didn't go well. But it happened that of the five courses, the Structure 1 courses did not go well. [Thando's interview, p. 26]

He explained that the first part of his 'gamble' was to check his averages before the examinations and to calculate the marks that he needed from the examination paper to pass with 50 percent. He then decided on the effort he needed to put into each course. He elaborated on the 'gamble' as follows:

Secondly, I check, if ever it happens that I fail that course, how will it affect my degree? Will I add another year or what? Like there are 3 courses I couldn't fail: it was Transport Planning [course 1]; if I failed it, I wouldn't do Urban Engineering 3 [course 2]. I wouldn't be able to do Hydraulics 3 [course 3]. Those two would mean I [would] have to add a year. So those are the kind of things I use, if ever this is a last resort. [Thando's interview, p. 26]

Thando expressed similar sentiments as Nombulelo with regard to the difficulties that they experienced when asking for examination timetables to be changed, suggesting that the class representatives tried but failed:

Yes, they [class reps] complained and they tried to negotiate and they were told that it is not the faculty who makes the decision. The faculty sends the number of students who write the course to the examination office. They draw up the exam timetable based on the numbers of students who are writing. [Thando's interview, p. 26]

At the end of his third year, Thando passed six of the nine courses and was able to proceed to fourth year. However, having failed the courses in second and third year resulted in the extension of his studies from five to six years.

6.5.3 Eric: Third year

Eric considered the third year his most difficult and blamed himself for his experiences, explaining this as follows: Firstly, he explained that, because he had been passing the courses with minimum effort until then, he had developed a 'bad habit' of putting in the minimum effort, even though his courses in fact required more commitment than they had before. Secondly, he believed that, having taken on the role of sub-warden at his residence exacerbated his situation by increasing his non-academic responsibilities and introducing him to more friends, resulting in taking more time away from his studies:

So I would have a lot of my friends, like newfound friends, they'd always be in my room. We'd always be hanging out so I'd always have to entertain them, so I never took my studies seriously, because I was always entertaining people. [Eric's interview, p. 18]

When asked whether he did not realise that the 'wheels were coming off', he indicated that he did not see it coming:

I never actually saw the wheels coming off (we both laugh). I guess I was just enjoying the ride. I knew what was happening, I could see what was happening, but it never occurred to me that this could happen to me and it never came as a shock. There was a time when I sat myself down and I said I deserve anything that happens, if I fail anything, I deserve it. [Eric's interview, p. 20]

Thirdly, Eric added that, while he was 'enjoying the ride' of his thriving social life, he did not deliberate on the financial implications of failing and the possibility of losing his bursary. At the end of the year, the consequences of his decisions cost him R15,000, which he had to pay for the failed courses:

To me, it cost me financially to repeat those courses. Money is something that I really value, so it is not something to just play around with…. [Eric's interview, p. 18]

When asked to reflect on why he was choosing not to care even when he realised that things were going wrong, he said that that over time he had let himself block things out. He was pretending that things were not going wrong and chose to not stress about this. Moreover, he said that unlike many students, he knew the reasons for his failure:

I knew exactly why I was failing. I knew it was because I wasn't putting [in] the time. I remember this one time I wrote two tests and I failed them, I got DPR for one of the courses. The night before the test I just gave up on it. [Eric's interview, p. 18]

Eric had failed three courses at the end of third year; however, he indicated that the combination of registering for repeat courses and being offered the opportunity to register for a summer term course enabled him to evade the possibility of adding an extra year to his studies:

The one course was Mathematics 2; I did it in the first semester and when I failed it, I repeated it in the second semester, and then I passed. The second course was Civil Mechanics; I did it in the first semester and when I failed it, I was supposed to add a year, but then the department offered it as a summer term course. I did it during the summer, so I didn't have to add a year. The other course was Water Treatment; I repeated that during the first semester this year and I passed it. So I don't have to add a year; I was very lucky…. [Eric's interview, p. 18]

Eric was thus able to proceed to fourth year without any negative consequences.

6.6 Students' deliberations about the fourth year

6.6.1 Nombulelo: Fourth year

Nombulelo indicated that her performance in third year had boosted her confidence and made her believe that she had the potential to pass in fourth year. A further enablement for her project was that she received an email from the civil engineering department to congratulate her as 'the most improved student' in the previous year. She added that knowing that someone cared enough to send her the email encouraged her to continue the good work that she started in third year. With regard to her approach in fourth year, she explained that she continued with the strategies she had used in third year; furthermore, she indicated that, although many of her classmates preferred to group themselves according to racial groups,

she decided not to limit herself to that and instead formed working relationships with anyone whom she believed benefited her studies, regardless of race:

I do all sorts of groups; I don't see it as a black and white thing. I just see it as OK, I am stuck and I need help, where do I go? If see them [groups] from that point of view, I'll actually lose focus and it will delay me. It will just bring complications and drama, so I don't look at things that way. [Nombulelo's interview, p. 34]

She found that students of other races often had more resources; they often had past test papers with solutions, resources she believed other black students in her group could benefit from, if they decided to overcome the racial barriers they set themselves:

I also encourage them to do the same and they will be like, no, we'll figure this out. So when they say, they will figure it out and I see that they are not figuring it out, I go and get whatever the understanding is and bring it back to them and say OK, guys, this is how you do it. But they don't really like it. [Nombulelo's interview, p. 33]

With regard to her approach towards her examinations, she indicated that she made two main changes: Firstly, she bought a wristwatch, which he had never owned before, and started to time herself, as she prepared for an examination. She explained that students tended to spend far too much time on a question while preparing for an examination and that they forgot that it was timed. Furthermore, she indicated that the wristwatch was helpful during the examinations, as some venues did not have a clock on the wall to indicate the elapsed time.

Secondly, she decided that, in an examination situation, she would always start with the question she could answer best:

My aim was to tackle what I know and end with what I don't know and try to hassle my may out of it. So my exams were OK. [Nombulelo's interview, p. 31]

Nombulelo passed all her courses at the end of the first semester and scored in the 80s for two of the courses. She was very excited that she had only one year left before completing her studies.

6.6.2 Thando: Fourth year

Thando acknowledged that the fourth year had been challenging for him and highlighted three aspects of his life that enabled him to cope with these challenges. Firstly, he indicated that he drew strength from his spiritual life, stating that God's grace assisted him:

I think it is about, if you still have the spirit of fighting, that's why for me I think it is the grace of God. It is what has kept me here. [Thando's interview, p. 28]

Secondly, he was helped by the support he received from his mother and from his bursary company:

My bursary, if I don't understand anything about the courses I am doing, I can go to them and they would show me. [Thando's interview, p. 28]

Thirdly, he said he always reminded himself of the reasons why he came to UCT, stating that many students tended to lose focus of this. He believed that it was the loss of focus that led many students to exclusion.

With regard to his approach towards the courses, he still preferred to work by himself and only to consult with other students when he did not understand. However, he indicated that he had started to spend more time in the tutorials sessions, where he could ask question more frequently.

With regard to the examination timetables, these continued to be a constraint for him, more so than had been the case in previous years. He believed that the unfavourable examination timetables were the result of straddling courses at different levels of study, a situation he believed was created by following the fragmented ASPECT curriculum:

Well yes, the problem is that we have people in 4th year doing some of the 3rd year courses and some people are doing second year, so maybe they weigh the probability of how many people are doing the course. [Thando's interview, p.27]

Although Thando's studies had been extended to six years, he was hopeful that he would eventually succeed and graduate.

6.6.3 Eric: Fourth year

At the beginning of fourth year, Eric said that he deliberated on his approach to his studies in previous years and decided that he needed to change his attitude and focus. He decided to set himself a new target of graduating with honours:

I looked back and I started realising that, as much as I particularly did not like what I was studying, at least I might as well try and be good at it. And one of those things was that I was aiming to get to the honours class. Now to get into the honours class, I need to get a specific percentage, which is 65% GPA. And I started going through my marks and I saw that I had a 70 something GPA first year, a 60 something in second year, and towards the end of third year, I am sitting at 58, which means 6% out of getting out of honours and I realised that, as much as I didn't like civil engineering,… I kept telling myself that I might as well try and be good at it. [Eric's interview, p. 25]

He said that he started to work on his new goal and at the end of the first semester, he managed to improve his GPA by two percent. He also approached a few other students and together they decided that they would encourage each other and work towards graduating with honours:

We started working together and I realised that, even though we were having fun at the end of the day, we all had a common goal and that was to graduate and to do it well… For now that's the drive to at least the point. I don't see myself as an engineer for a very long time but I can try to finish it well. [Eric's interview, p. 26]

As much as he had enjoyed some of the civil engineering courses, he struggled to embrace the idea of working as an engineer, indicating that he did not see himself working for someone else.

Eric passed all his examinations at the end of the first semester and he was confident that he did well in the recent second semester examinations. He believed that, if he put his mind to it, he would graduate the following year with honours. He admitted jokingly that, when he came to UCT, he wanted to finish his studies and go to work, but that the life he had had made him want to stay longer. He had been happy with the human contact at UCT and built

relationships with friends whom he believed understood him, and this more than anything else, made his life at UCT worthwhile.

6.7 Conclusion: Modes of reflexivity

This chapter described the journeys of the three civil engineering students who participated in this study, as they made their way from first year to fourth year during the socio-cultural stage (T^2-T^3). The students' backgrounds were briefly described, which was followed by an introduction of their ultimate concerns and projects. Furthermore, students' deliberations about their experiences as they progressed through the years were detailed. Although the three students were pursing the same project of obtaining a degree in civil engineering, they were all hoping to realise different ultimate concerns. Nombulelo hoped that completing the degree would enable her to afford to provide a better life for her family, including building them a 'big house'. Moreover, she hoped that the degree would equip her with the skills to have a positive impact on the lives of people in her country. Expressing similar concerns, Thando hoped that the degree would help him to realise his ultimate concern of a 'good and successful life' and equip him with the skills to affect other people's lives positively. It was noteworthy that both Nombulelo and Thando expressed the concerns of affecting other people's lives, something that none of the chemical engineering students in Chapter 5 had mentioned. Eric's ultimate concerns included wanting a 'good life' and making his parents proud, and he thus hoped that a degree from UCT would enable him to realise these concerns.

With regard to each student's mode of reflexivity, Nombulelo's dominant mode appeared to be autonomous reflexivity. She demonstrated independence in completing her deliberations, even when this did not always yield positive results. She demonstrated an ability to take strategic action to overcome potential and actual constraints when she decided to consult with the career office to evaluate her options about a career change; although she was advised to change her career at the end of the year, she then reassessed her options, before making a decision to continue with engineering. Nombulelo demonstrated that, in deciding to continue with her studies in engineering, she understood that she needed to take strategic action to overcome potential constraints. For example, although she indicated that students in her class tended to stick to their racial groups, she decided to look beyond race and asked for help from whoever could assist her, even if this mostly entailed having to ask students of other races. In dealing with some constraints in examinations, she took strategic action and bought herself a

wristwatch, realising that it would help her to be better prepared. She demonstrated that she was willing to overcome personal limitations to pursue her project successfully.

Thando's dominant mode appeared to be autonomous reflexivity. He demonstrated the ability to complete inner thoughts and to come up with solutions to his problems. For example, he was strategic in his choices of friends, and did not want to associate with those who would interfere with his engineering studies. He also demonstrated positive self-talk to encourage himself in his second year, after he had failed some courses in the first semester. He took strategic action to overcome constraints in the second semester, when he decided to prepare himself for the second semester courses. In the later years, Thando realised that it was beneficial to spend more time with other students and he thus decided to spend more time in tutorial sessions and to access the help he needed. Although his actions have not always yielded the desired outcomes (for example, he failed courses and was consequently on a six-year journey), he believed in his ability to overcome constraints and to realise his ultimate concerns.

Like Nombulelo and Thando, Eric's dominant mode also appeared to be autonomous reflexivity. Although his narrative was strikingly different from other students (for example, by embarking on a mission to improve his social life and viewing the potential enablements of ASPECT as constraints), he demonstrated great independence in his studies. He did not need his friendships to complete his deliberations; instead, he used them to 'show off' his ability to succeed with minimum effort. But more importantly, he demonstrated his ability to complete his deliberations, when he set himself a goal to graduate with honours. Once he had set himself this goal, he then deliberately approached others and encouraged them to set themselves the same goal, in the belief that this would hold him accountable to his goal. Although he indicated that he might leave the field of engineering once he had graduated, he nonetheless took strategic action to ensure that he succeeded in the current project with good marks.

A further analysis of students' mode of reflexivity is presented in Chapter 9.

Chapter 7 - Electrical engineering students

This chapter focuses on the T^2-T^3 stage for the next group of students, the three electrical engineering students, as they made their way through first year to fourth year. As previously, the chapter begins with brief introductions of the three students' backgrounds, as these account for the emergence of their primary agency. The introductions are followed by an outline of students' concerns and projects. The subsequent sections describe students' deliberations about the constraints and enablements they encountered, as they made their way through each academic year.

7.1 Students' backgrounds

7.1.1 Katlego's background

Katlego came from Zebediela, a village in the Limpopo province. She was the fifth in a family of eight children. Her mother was a teacher, while her father had recently retired from being a police officer. All her siblings, except the youngest two who were still at school, had completed grade 12 and had studied further at either higher education or further education institutions. She was the third of her siblings to study engineering. Her eldest brother, who tragically died in a car accident during her first year at UCT, was the first to complete an electrical engineering degree. She described her family as 'close' and 'supportive'. She said that her parents, although not wealthy, had made sacrifices to save money through education policies to cover some of their educational costs.

Katlego described Zebediela as 'very rural', as many households cooked on open fires outdoors. She loved her community for its simple life and, although she was the first one to study so far away from home, approximately 1,800 kilometres away, she nonetheless fitted in when she visited her home during the holidays.

She described her high school as 'under-resourced', as it did not have computer and science laboratories. Nonetheless, she commended the school for its good teachers and, in particular, she praised her mathematics and English teachers. She also praised the school's alumni for their efforts to encourage others learners to study further, and for bringing application forms from their respective universities; she too brought application forms for learners at the school and assisted them with the application process. She indicated that every year the school arranged for learners to attend open days at Wits and at the University of Johannesburg; as a

result, the majority of those who made it to university tended to go to those two institutions. She was the first one who had decided to leave her familiar environment and to study in Cape Town. She explained that, unlike many students from her school, she decided not to apply to Wits or the University of Johannesburg because she wanted 'change' and to 'grow out' of her community, which was an indication that she was independent and ready for contextual discontinuity.

With regard to her career choice, she chose to study electrical engineering because she wanted a degree that would offer her many opportunities and challenge her. She was accepted to study electrical engineering through ASPECT; it did not bother her that this meant she would take five years to complete her studies, rather than the four years it would take through the mainstream programme.

7.1.2 Pitso's background

Pitso came from a small town of Villiers in the northern Free State. He was the eighth of nine children. After his parents divorced, he lived with his mother and stepfather and continued to have a good relationship with his biological father. Owing to the lack of employment opportunities at Villiers, Pitso's parents relocated with him and his younger sister to Johannesburg in search of better employment prospects. As a result, Pitso lived in Johannesburg from when he was in primary school until high school. When he was in grade 10, however, his stepfather died, and Pitso saw this as an opportunity for him to return to Villiers to live with his brother. He acknowledged that he did not like living in Johannesburg, but that he had stayed, because his stepfather, with whom he had had a good relationship, had insisted. Later that year, his mother and his younger sister also returned to Villiers. Shortly after returning from Johannesburg, his mother also died. Pitso's eldest brother took over as his guardian.

Pitso described Villiers as lacking employment opportunities, and affected by a high crime rate and high alcohol consumption. Moreover, the community lacked recreational facilities, leaving the youth with little to do, besides the activities offered at schools. Although he painted a bleak picture and did not identify with many of the activities there, he admitted that that he preferred it over living in Johannesburg.

After relocating from Johannesburg to Villiers, he was accepted in a new high school that he described as 'good and disciplined'. He said that the school had good teachers and resources; it had a computer laboratory with access to the internet, and this enabled him to explore computers with his friends, an activity he said he enjoyed greatly.

Pitso revealed that he enjoyed problem solving and was passionate about computer programming. He had initially wanted to study computer science; however, he later learned that an engineering career could get him to do both computer programming and problem solving. With regard to the engineering disciplines, he had initially wanted to study chemical engineering because he heard that it was the most challenging, and he wanted to challenge himself.

Pitso applied to Wits and UCT. At Wits, he applied for chemical engineering and computer science as his first and second choices respectively. At UCT, he applied for chemical engineering and electrical engineering as his first and second choices respectively. Wits rejected his application for both chemical engineering and computer science, but offered him a bridging stream in science. UCT rejected his application for chemical engineering, but offered him the opportunity to study electrical engineering through the ASPECT programme. He was not concerned that UCT had accepted him for his second choice because he said he was informed that he could switch disciplines after the first year. He chose to study electrical engineering at UCT and later disclosed that his unpleasant experiences in Johannesburg influenced his decision to move to Cape Town. He had already secured financial aid at UCT, and was also offered accommodation at one of UCT's residences.

7.1.3 Zingiwe's background

Zingiwe's family was originally from King William's Town in the Eastern Cape; however, they relocated to George in the Western Cape so that her mother, a street vendor, could have better opportunities to sell her merchandise. The family moved to an informal settlement in George, which did not have basic services, such as running water and sanitation. She was the second of five children; her elder brother was unemployed and did not complete high school. Her younger sister had recently failed grade 12 and this made her the only one who had finished high school. The two younger brothers were still in school. Later, while they were living in George, her mother's business experienced difficulties that prompted her to move to Port Elizabeth in search of better opportunities. The rest of the family remained in George and

her mother came home regularly to visit. Her biological father died when she was ten years old and thus they lived with their stepfather.

Zingiwe described herself as 'always different' from her siblings; she was intelligent and hardworking. Although this gained her respect and admiration from teachers at school and the community at large, she indicated that some children and community members scolded her; as a result of such experiences, she felt unable to perform to her full potential. She indicated that many teachers were good to her, she particularly acknowledged her mathematics and biology teachers for guiding her and eventually advising her to apply to UCT.

She applied to UCT only and for medicine and electrical engineering as her first and second choices respectively. She explained that, although she did not like medicine, she was doing it for her late father who always referred to her as 'Dr'. She applied for electrical engineering because she thought electricity was 'cleaner' than machines and bridges. She said that she was thrilled to be accepted for electrical engineering through ASPECT and the length of her programme did not matter to her. A potential constraint, however, was that UCT had not offered her accommodation; as a result, she moved to Khayelitsha, a township in Cape Town, and stayed with a relative of her brother's friend.

7.2 Students' concerns and projects

Katlego's ultimate concern was that she wanted to live a more comfortable and successful life than her parents had done. She was aware that she needed money to afford such a comfortable and successful life:

I want to be successful in life and I need money to live a comfortable and great life. I mean coming from Zebediela and you end up staying in Sandton, you want to live a better life and make sure that your kids go a different route…. [Katlego's interview, p. 5]

Katlego indicated that career success was important to her and she believed that getting an engineering degree was the first step to many opportunities in her future career. Her project was thus articulated as getting the degree.

So I am getting there, I'm getting this degree! [Katlego's interview, p. 5]

Pitso's ultimate concern entailed a successful career and family life, and he felt that these two aspects were intertwined. His project was articulated as getting a 'flexible' degree that would ensure continuous growth and he believed engineering degree was the career that offered him the most flexibility:

I am only doing engineering because I know it is one of those fields that you can do more. It is not like you can go there and be in a strict or be based on one thing. It's more open, you can end up doing marketing or whatever, but you've started in engineering. [Pitso's interview, p.17]

Zingiwe's ultimate concern entailed 'a better life', which she explained as building a house for her mother and helping her family out of poverty:

I am the first and the only one to make it to university. So I feel like it is my responsibility to study so that I can be the one who will take care of the family. I also want to show people back home that, despite your background and your circumstances, you can do it. If only you believe in yourself and believe that God has a purpose for your life, then you can do it. [Zingiwe's interview, p. 11]

She also wanted to be a role model to encourage others to pursue their dreams. Her project was articulated as getting a degree, in the belief that it would enable her to realise her ultimate concerns.

I need to get the degree, that's all. I just want this degree. [Zingiwe's interview, p. 29]

7.3 Students' deliberations about the first year

7.3.1 Katlego: First year

Katlego described her first few days at UCT as 'very difficult', stating that it was 'a completely new world' for which she was ill-prepared. She said that, although she knew that UCT would be a multi-racial and multi-national institution, she was not prepared for the actual experience. She recalled that, while many students stood in queues with their parents for registration at her residence, she had no one holding her hand and she thus realised that she and the other students in the queue came from 'completely different worlds'. However, although things were difficult at first, she consoled herself with the realisation that there were students who were in worse situations than she was:

It was bad, like it was really bad. But as time went on, I made friends and I think that is the most important thing because I get to know that other students were in worse situations than me sometimes. Then I consoled myself that I am not alone… [Katlego's interview, p. 14]

Although she acknowledged that she found the university atmosphere challenging at first, she indicated that being in ASPECT enabled her to adjust easily. With regard to her studies, she indicated that senior ASPECT students had advised her to always keep up with her work. She was mindful of the fact that in high school she was better at mathematics than physics and that she would need more help with the latter. She was thus able to do well in the Mathematics 1 course, as the frequent assessments enabled her to keep up. She sought help from other students in the Physics 1 course, and they helped her to pass it. She found the ElecEng 1 course difficult, citing two constraints to the course. Firstly, she cited the pace of the lectures and her inadequate knowledge of the topic of circuits as the reasons why she found it challenging. Secondly, the attitude of mainstream students towards ASPECT students often made things more difficult for them:

The problem is that they think they are smart and that makes them talk a lot of rubbish. They undermine, they discourage you and they think you are not smart. They come with that mentality of high school that they were top, so they think you don't know anything. They wouldn't even talk to you when we did the labs for the ElecEng 1 course. You'd do it with another ASPECT student because you are not even friends with them. They don't open up to you; they judge you. That's how it is. [Katlego's interview, p. 11]

Katlego became a class representative for the ASPECT students in the ElecEng 1 course. She said that, although it was a good thing to be chosen, it put pressure on her to perform in the course. At the end of the academic year, Katlego passed all her courses; she scored her lowest mark of 56 in Physics 1.

7.3.2 Pitso: First year

Pitso indicated that he made friends quickly with some electrical engineering students at his residence; however, his friends were in the mainstream programme. He explained that at first he did not know the difference between the two programmes but, owing to the negative comments that other students made about ASPECT, he quickly learned that it was not a 'fun' programme:

It sounded like it [ASPECT] was not really a fun programme to be in because when I got here I made friends who were in the mainstream programme and who were best learners from their schools and they are still best even now; they are always on the dean's merit list (which I'm not) and I'm in ASPECT, so they'd normally pass around those criticisms about ASPECT. [Pitso's interview, p. 14]

He said that, although he felt uncomfortable at first, he became comfortable in ASPECT when he realised that other ASPECT students had similar admission points as he did.

With regard to his studies, he mentioned several constraints that made the early weeks difficult for him. Firstly, he found it difficult to get used to how things worked at UCT:

I think the difficulty was getting used to the way things work, getting used to the times, the way everything had to be done. Just getting used to the UCT system and how things work was challenging. Having to check Vula, emails, and having to make time to study and make time to consult and ask people. That was a struggle. [Pitso's interview, p. 22]

Secondly, he explained that, owing to his poor background in physics at school, he was reluctant to approach others, because he did not want to appear as 'not being smart'. After failing the first Physics 1 test, however, Pitso decided to change his approach, and joined a group of ASPECT students who worked together on the course. He explained some of the reasons why he joined the group:

I it did because I realised that when I was working on my own, when I was preparing for the test, I got stuck in most of the things. There were some of the things that I didn't really understand. I knew how to solve a couple of problems, but I didn't really understand why we were doing that, or what method we are supposed to apply. So I started asking for help. That's why we started forming groups, because I started realising that I am not the only one who doesn't really understand. [Pitso's interview, p. 21]

Pitso described the study group as 'progressive' because they covered more work, addressed problems, and consulted lecturers together when they had problems.

With regard to other courses, he said that he found Mathematics 1 'easy' and passed most of the assessments well. He found the ElecEng 1 course 'easy' and stated that it was his

favourite course. At the end of the year, he passed all his courses, and his marks ranged between 62 and 79 percent.

7.3.3 Zingiwe: First year

Zingiwe pointed out several constraining circumstances in which she found herself in first year. Firstly, she indicated that staying off-campus and under extremely unfavourable conditions and having to commute to campus made here feel like she was not a 'real student':

There were times where I felt like just giving up. There were times where I thought, maybe places like UCT are not for people like me. I started thinking like that because sometimes I would feel as if I am not like other students. [Zingiwe's interview, p. 15]

She spoke with sadness about her difficult living conditions in Khayelitsha. She stayed in a two-bedroomed house, in which eleven people shared the living space; she became the twelfth. Her living conditions were thus challenging, particularly because she did not have a place to study, as she shared a room with five family members. Moreover, as the adults in the family were unemployed, she felt that she was adding to the already constrained family circumstances. She then had to commute to UCT and make it to the eight o-clock lecture. Moreover, owing to the levels of crime in that section of Khayelitsha, she often feared for her safety. At that time Zingiwe could not rent a room closer to campus because financial aid took three months to sort out her funding. She depended on her mother for transport money and she said that it was sometimes not enough.

Secondly, with regard to her studies, she stated that, owing to a lack of resources, she was unable to buy books and this resulted in her failing:

I was just failing (she laughs). I was failing dismally. It was just terrible. First of all, I didn't have textbooks. I had nothing, no stationery, nothing. My mom had to send me money for pens, ruler and stuff like that so I only had the very basic stuff. I didn't have textbooks. So if we were given a tutorial or homework and told it is on page so and so, I couldn't do it because I didn't have the textbooks [Zingiwe's interview, p 17]

She said she had to rely on notes that she gathered in class, however, the notes were often incomplete, because she initially found it difficult to listen to the lecturers and write at the

same time. Moreover, she found the library unhelpful, as other students always loaned out the textbooks she needed. She shared her experience of failing her first Physics 1 class test:

I remember for my first physics test I got one out of 20. But I wasn't the only one; at least that made me feel better (laughs). But I was broken. I remember that day when I got the test results, I couldn't eat, I couldn't... I found it hard to accept; I was depressed basically. I couldn't accept the fact that I got that mark. I wept. I was depressed for days. [Zingiwe's interview, p 17]

She also struggled in the ElecEng 1 course, particularly with using the computer; she said she had not been exposed to computers before:

I remember that I struggled a lot (both laugh); I was not computer literate at that time, so I struggled. I was also doing ElecEng 1 and I remember Prof Adams used to ask us to submit things on Vula. There was this one time where I had to submit a typed report and I had to ask a friend to actually help me with the typing; I was very slow, it was embarrassing. [Zingiwe's interview, p. 27]

At the end of the first semester, Zingiwe had performed poorly in both Mathematics 1 and Physics 1 and she was advised to register for the 'decant[8]' courses. Although it was difficult for her to accept that she was failing, she said she needed to be realistic about her chances of passing at the end of the year:

I had to be realistic and see that if I failed like this in the first semester, this is what I needed to make up and for me it looked impossible because I needed 80s and 90s for me to get a 50, because first semester was just terrible. So I had to come to terms with the fact that it was either I was 'decanting' or it was over for me. So I couldn't take that risk and I knew that I had to work harder, but it was really difficult. [Zingiwe's interview, p. 19]

Zingiwe revealed that her circumstances improved in the second semester when she found accommodation near the city centre and this enabled her to travel to campus more easily. However, her earlier circumstances had already had a negative impact on her studies.

[8] The 'decant' courses were 'repeat courses' introduced in the EBE faculty for students who were not coping with the first semester of Mathematics 1 and Physics 1 in first year.

Although she 'decanted' Mathematics 1 and Physics 1 and improved her performance in them, she struggled to recover in ElecEng 1 and subsequently failed the course. Owing to the different readmission criteria for ASPECT students, particularly in relation to students who had 'decanted' courses, she was academically excluded. She was successfully able to appeal against her exclusion and said that this was as a result of her mother's encouragement and the support she received from the ASPECT staff. She was thus able to proceed to second year.

7.4 Students' deliberations about the second year

7.4.1 Katlego: Second year

Katlego indicated that, in general, she found it easier to adjust at the beginning of second year, because she was now familiar with the university rules and what she needed to do to succeed. She also became a mentor to some first year ASPECT students and that was her way of helping others to settle in at the university.

Although Katlego seemed to managed the transition from first year to second year without major problems, she did mention one constraint: she indicated that the second year electrical engineering curriculum for ASPECT students was very constraining compared to other disciplines, and she said this was because they registered for more courses than did ASPECT students in other disciplines. She believed that this was partly the reason why many of her peers failed.

One of the early ways in which Katlego and Pitso mediated the constraints of the electrical engineering curriculum was that they decided to start applying for concessions to register for some courses for which they did not have prerequisites. This strategic way of avoiding the potential constraints of the curriculum became more pronounced towards the end of the second year. Prior to that, however, Katlego and Pitso seemed to have influenced each other's decisions, drawn on each other's strengths and challenged each other to perform well in their courses. According to Katlego, the two became the most advanced ASPECT electrical engineering students in their cohort and this was partly because they seemed to have avoided a potentially constraining curriculum.

7.4.2 Pitso: Second year

Pitso too pointed out several issues that made second year challenging for him. Firstly, he indicated that, because ASPECT students were straddling first year and second year courses in their second year, he experienced timetable clashes:

It was a problem because most of the things clashed; let's say you had a first year tutorial today and then you were going to have a second year course tutorial that was scheduled for that day. So you had to skip something in order to attend something, which was bad when it came to exams. [Pitso's interview, p. 23]

Secondly, he said that he found the significantly increased workload in second year 'problematic', an issue that Katlego had also raised about the increased number of courses in second year. Pitso raised a similar issue as Katlego, i.e. that some students could not cope with the load:

That is the problem and people don't really cope with that load; that's why many people fail some courses. I think that [increased load] is the university's challenge on the whole APSECT and other extended progammes. The sharp increase in the workload is something that others can't cope with. [Pitso's interview, p. 32]

Thirdly, Pitso indicated that, because he was following the ASPECT curriculum, and thus straddling two different years, he found it difficult to identify with and 'belong' to a specific mainstream cohort:

I think the challenge is that you don't really know which group you belong to because you are doing some courses with first years, and some with second years. So you are being pulled in different directions and have to make more friends in order for you to adapt and get more information quickly. [Pitso's interview, p. 23]

With regard to some of the enablements, Pitso stated that he drew on the support from Katlego and some of the friends in the mainstream programme whom he had met in first year. With regard to matters that affected the ASPECT students, he said Katlego was a great source of support and helped him to push himself in order to perform well.

7.4.3 Zingiwe: Second year

Zingiwe reported that, after experiencing a very challenging first year, she found second year better; she alluded to some enablements in this regard. Firstly, she said that she now lived within walking distance to campus and was able to access the facilities and resources. Secondly, because she was living close to campus, she was also able to study with her friends who were staying on campus and found them a great source of support.

As she had failed the ElecEng 1 course in first year, however, she was mainly completing first year courses in her second year and, as such, she was unable to register for the second year electrical engineering courses. Nonetheless, she passed all her courses that year and used her results to apply for a bursary for subsequent years, which was a financially significant enablement for her project.

7.5 Students' deliberations about the third year

7.5.1 Katlego: Third year

It was indicated in the previous section that Katlego and Pitso influenced each other's decisions to apply for concessions. Although Pitso had passed all his courses, Katlego had failed some and thus had to be more strategic in negotiating her way through third year. Firstly, she applied for a concession to register for the Digital Electronics course, despite the fact that she had failed a prerequisite course. She argued her case as follows:

I applied for a concession and when I applied, I just told them that I failed Fundamentals of Electronics with 49. I just said that it was my last exam, I feel I was tired, not that I don't know the work. I got 49, so clearly it is almost got 50, so can I please be allowed to do Digital Electronics. The concession was approved. [Katlego's interview, p. 26]

When she was asked why she insisted on registering for the Digital Electronics course, she gave two reasons. Firstly, she wanted to keep up with Pitso. Secondly, and most importantly, owing to the structure of the ASPECT curriculum, she fell short of the minimum credits for which she was required to register. She believed that, owing to the 'lack of credits' argument, several of her concessions were granted. The granting of concessions, however, led to many timetable clashes. However, this did not worry her, as she believed she could skip some of the course lectures and learn them on her own. In some of the courses, she was expected to

attend labs and practicals, but she mediated this potential constraint by negotiating that she be exempted from them. In one course, for example, when the lecturer refused to exempt her from attending labs, she approached the Head of Department and pleaded her case:

He [course lecturer] refused. I then went to the HoD he said 'your class record looks good so let's just exempt you from everything'. The HoD then emailed the lecturer and told him to exempt me from everything [except the exam] so that I can save time and do other things. This was so that I can finish on time next year. [Katlego's interview, p. 24]

Secondly, Katlego seemed to have been strategic and persistent in that, in some cases, she negotiated for marks to pass a course she had failed. For example, at the end of the first semester, she had failed the Signals 1 course and negotiated with the lecturer:

For Signals 1, I got 48. Funny enough I didn't want to go to the lecturer, but I went there and do you know what he said to me? He is OK, the June results are actually not official, if you go and pass everything in the second semester, then you can come back and maybe 50% we can talk about it. He actually took out my script and put it on the table, and we looked at my script because he is like OK, I actually looked for you, but it was difficult for me to find 2%... It took us 3 hours to discuss this fighting for 2%. [Katlego's interview, p. 26]

Although she did eventually fail the course, she wanted the lecturer to know that she had passed more difficult courses than Signals 1 and that, as such, she deserved to pass it.

Thirdly, Katlego also took strategic action against potentially constraining examination timetables. She gave an example of one such incident in which the timetable was unfavourable for her; she, together with Pitso and two other students, decided to email the examination office to query it. The examination office informed them that the timetable could not be changed, as their query affected only a small number of students. Katlego did not let that unfavourable response deter her; instead, she approached the ASPECT coordinator and asked him to intervene. The examination timetable was subsequently changed to accommodate them.

At the end of third year, Katlego passed seven of her eight courses and was able to proceed to fourth year.

7.5.2 Pitso: Third year

Pitso had passed all his courses from the previous year and as such, he faced slightly different constraints to Katlego. Firstly, he explained that the electrical engineering curriculum for ASPECT students became ambiguous for someone in his position:

So if you pass everything, then the following year, everything is open for you. And if you fail one of them then, nothing is open for you and you have to come back for those and maybe one of the ones from the next level. [Pitso's interview, p. 24]

Students like Pitso, who had not failed any course, could select certain courses as a result of receiving concessions. He thus sometimes applied for courses for which he did not have prerequisites. He and Katlego had agreed to use the 'minimum credits' argument and the concessions were always granted. He said that, although he found it frustrating that there was no specific set curriculum for him, in the end, this vagueness enabled him to choose his courses and he was thus able to select courses, which he could do with his friends in the mainstream programme, something that he felt benefited him:

And then with me, it allowed me to [study] with my mainstream friends and, since they had done some prerequisite courses, I learned that from them and they helped me whenever I needed the help. [Pitso's interview, p. 28]

He explained that, as a result of the granted concessions, in many instances he was unable to attend lectures and tutorials because of timetable clashes and as such, he had to do most of the studying outside class, without attending lectures and tutorials. Pitso revealed that he and Katlego had a simple strategy; they ensured that they passed the courses that were perceived as difficult, and once they had achieved this, it enabled them to apply for more courses. He explained the logic behind applying for concessions to do difficult courses and said that it was done so that, should they have failed, they could repeat the courses without adding an extra year to their curriculum.

7.5.3 Zingiwe: Third year

Zingiwe spoke about some of the constraining circumstances that made her third year a challenging one for her. Although she had secured a bursary at the end of her second year,

she received the funds only in the second semester; this created problems for her in the first semester:

I kind of went back to square one, like I was in first year. I did not have money to pay for rent and things like that. So I was forced to stay in the Pinelands residence because I had no other option. [Zingiwe's interview, p. 21]

Thus, firstly, she could no longer afford to pay the rent for the flat she had rented in second year. As a result, she moved into a UCT residence in Pinelands, where she was not required to pay upfront. Although her circumstances at the residence in Pinelands were not as ideal as they had been in the second year, she was nonetheless grateful that things were not as bad as when she stayed in Khayelitsha. However, a constraint about living in Pinelands was that transport to campus was limited.

Secondly, she explained that she ran out of food and had to borrow money from some students. She said that borrowing money affected her friendships, as she was unable to pay it back when they asked for it. She said that she had approached the financial aid office for assistance but was informed that they could not help her because she had a bursary. She said that, whenever she contacted her bursary company to ask for funds, they often had a bad attitude towards her:

They don't understand that for students, first of all we need food and books, you need such things and they just take forever. And when they pay it is as if it is the first time that they ever had bursaries. So I was really frustrated and now I had to get my mom to send me money again. [Zingiwe's interview, p. 30]

She said that the bursary company did not understand that there were negative consequences for the student to receive their money in the second semester when they were registered for first semester courses. Because she did not have money, she was unable to purchase books and subsequently failed four of the eight courses for which she was registered. She said that she was just grateful that, after failing four courses, she had not been excluded.

7.6 Students deliberations about the fourth year

7.6.1 Katlego: Fourth year

Katlego continued to take strategic action to overcome constraints in her fourth year. For example, during the third term, she had an accident in which, without noticing, she walked through a glass door and smashed it, such that glass penetrated her scalp; she was badly injured and had to be hospitalised. Prior to the accident, she had been studying for an examination that she was due to write at the end of the term. She expressed the hardship that resulted from the accident:

It was bad you know. I missed two weeks of lectures, so clearly I had to catch up. I think I got depressed at some point. I felt helpless. I think I told my friends that when we talk about hardships of life, I would say this is the one that stood out more than anything else I've experienced in my life… [Katlego's interview, p. 37]

Katlego said that when she tried to apply for a deferred examination, the doctor refused to sign her form, stating that she was mentally fit to write, even though she was physically injured. Katlego did not let this constrain her; instead she decided to approach the Head of the Department:

I decided to go tell the HoD; he gave me a letter, he was really pissed off about what the doctor said. He helped me and he said he fully supported that I must get a deferred exam. [Katlego's interview, 24]

In another potentially constraining situation, Katlego decided to challenge the Project Management examination, suggesting that it had not been set properly and was overly riddled with errors. After the examination, she approached the class representatives and asked them to raise her concerns about it. She, together with them, wrote a letter to the department of mechanical engineering and the dean of EBE to complain. When asked why she felt the need to write the letter, she explained:

Sometimes as students we mumble without action. So Seps and I typed the letter at the Blue lab immediately after writing; we sent it to the class rep to get input from them and indeed that was done. Then we submitted it to the mechanical engineering department. Then we got feedback from the HoD of mechanical engineering. Then they said they are looking into it.

We told them that this would cause a problem with ECSA. We also told them that we are not prepared to repeat the course…. [Katlego's interview, p. 32]

Katlego's action suggest that she was deliberate about addressing constraints and often organised collective action to be taken to ensure that her concerns were addressed.

At the end of the interview, Katlego indicated that she was still scheduled to complete her studies in the fifth year:

I'm finishing next year. Every time I look back, I look back with a smile. I think I am very strong. I look at my background, where I come from and where I am now. I did really well. I always look back with a smile because considering that ASPECT students, most of them... I am sure it is just me and Pitso who will finish in electrical [engineering] in record time. [Katlego's interview, p. 39]

Katlego was looking forward to graduating; thereafter she planned to meet her work obligations with her bursary company, and later move to investment banking.

7.6.2 Pitso: Fourth year

Pitso continued to apply for concessions for courses for which he had not completed prerequisite courses in his fourth year and indicated that having passed the so-called 'difficult' courses in third year made things easy for him. When asked how he managed the fourth year level courses that clashed with some of his third year level courses, he explained that his strategy entailed attending lectures for the 'difficult' courses and covering the work for other courses over weekends. His strategy of exploiting the 'loopholes' in the curriculum put him in a position, where he could complete the degree in four-and-a-half years, something that was rare but possible with the electrical engineering ASPECT curriculum.

With regard to some enablements, he indicated that his friends continued to be a useful resource; they gave him their study material for the courses that they had completed and helped him when he had difficulties. He then indicated that the main constraint to his approach to curriculum was that he mostly ended up with unfavourable examination timetables. He said that the examination timetables mostly did not account for the fact that the ASPECT curriculum, by its design, was such that students straddled courses at different levels of study. He said that he was fortunate that he had not written two examinations in one

day, however, there were times when he wrote one examination at five in the afternoon and another at eight the next morning. He said that, in such cases, he had to compromise:

It was more of a compromise, you compromise what you think you will do best at for something that you think you might fail. That's how I managed my exam time… so I am saying that if the timetable was more friendly I think most of the ASPECT students would actually ace some of the courses. [Pitso's interview, p. 31]

Pitso was on schedule to graduate in the fifth year; he indicated that, whilst it was possible for him to finish in four-and-a-half years, he had decided to wait and use the time to improve his curriculum vitae through participation in the mentorship programme and in the engineering student council. He also indicated that, upon completion, he intended to register for a Master's degree.

7.6.3 Zingiwe: Fourth year

Zingiwe explained that, after experiencing a financially difficult first semester in her third year, she had prepared herself to minimise the potential challenges in her fourth year. Thus, when her bursary eventually paid the money in the second semester of third year, she saved most of the money to pay for accommodation closer to campus:

I knew the struggle that I went through in third year, so I was like, I'm going to keep this money and I'm going to use it for the time being. So when the bursary paid this year, I was still not in need for cash. I even lent money to some of my friends because I just had enough saved. [Zingiwe's interview, p. 31]

She then referred to some of the potentially constraining circumstances she had encountered, most of which were in relation to the examinations. Firstly, she expressed her discontent with the difficulty of her recent examinations, stating that she believed UCT used examinations to exclude students. She referred to the Project Management examination, which Katlego had also mentioned earlier, and described it as 'a mess'. Furthermore, she was frustrated, as this course examination was her first examination:

You can imagine having that as your first exam. There was no way you could be able to study for other exams after that one. It was just depressing. [Zingiwe's interview, p.35]

Secondly, she indicated that the examination timetable was so unfavourable that she often did not have time to rest:

It has been extremely difficult because here you are studying, but sometimes you feel like you are not doing anything. I remember this one time I was so frustrated I had to sleep because I couldn't get anything in my head because I had not slept. There was so much that still needed to be covered. I was just trying to study but I couldn't. So I just lay there in my bed for 30 minutes with my eyes closed. I was trying to sleep but my mind was busy. I feel like I was wasting time; I just didn't know what to do. I cried; I didn't know what to do anymore. [Zingiwe's interview, p. 35]

She added that she was thus unable to prepare adequately for the examination, as she was exhausted. Although she was frustrated, she was nonetheless proud of her achievements in the past four years:

When I look at myself in the mirror, I am proud. I know that there are people who would have given up a long time ago if they were in my shoes. They would have looked down on themselves and said 'oh I don't belong here'. But for me, I just said I will keep fighting until I make it. I'd say that a part of me feels like these experiences happened for a reason. I think I'm now a stronger person. If I didn't go through these, I wouldn't know that I had so much strength. So in a way I am grateful for what happened and I've learned a lot from it. [Zingiwe's interview, p. 35]

Although her programme had already been extended to six years, mainly as a result of failing the courses in third year, she was positive that she would eventually succeed and obtain her degree.

7.7 Conclusion: Modes of reflexivity

This chapter described the journeys of the three electrical engineering students, as they made their way from first year to fourth year during T^2-T^3. The students' backgrounds were described, which was followed by a discussion of their ultimate concerns and projects. The three students introduced in this chapter were pursuing the same project of completing the electrical engineering degree, in the belief that it would help them to realise their ultimate concerns and meet their life goals. Katlego's ultimate concern entailed living a 'comfortable'

and ‘successful’ life and having a ‘flexible’ career, while Pitso’s ultimate concern entailed a successful career and family life. Zingiwe’s ultimate concern entailed a dream for a ‘better life’ and to help her family out of poverty.

With regard to their modes of reflexivity, Katlego’s dominant mode while at university appeared to be autonomous reflexivity. She demonstrated independent thought and the ability to complete her deliberations. For example, she decided to negotiate with lecturers to be exempted from labs and tutorials and, when things did not go her way, she approached the Head of the Department. Having realised the vulnerabilities of the electrical engineering curriculum for ASPECT students, she was able to take strategic action to overcome the limitations of the curriculum and exploited them by applying for concessions. She also demonstrated great initiative in mobilising for collective action, for example, when she and other students wrote to the examination office to query an unfavourable examination timetable; in these ways, she demonstrated that she was a student who could made things happen.

Pitso’s dominant mode, like Katlego’s, appeared to be autonomous reflexivity. He was able to complete his deliberations and decide on the courses of action that best promoted the pursuit of his project. For example, as he realised that his background knowledge of physics was poor, he decided to join a study group, through which he mediated the constraints of failing the course. Pitso was also strategic in choosing his courses, and hoped that through registering for the ‘difficult’ courses first, he could draw on the resources from his friends in the mainstream programme. He also demonstrated an ability to work independently when, upon being constrained by timetable clashed, he decided to study some courses without attending lectures and tutorials. He and Katlego influenced each other and together they made decisions that helped them to mediate the potentially constraining ASPECT curriculum.

Zingiwe’s dominant mode too appeared to be autonomous reflexivity. She demonstrated great strength and overcame many constraints to her project. For example, she learned to use very limited financial resources to commute from Khayelitsha to campus and to ensure that the money covered her basic needs. She had to keep going during the first semester, even though she did not have the required textbooks. Later that year, when she was academically excluded, she did not give up on her project; instead she appealed against the exclusion, and was able to continue. To minimise the potential constraints in second year, she decided to find accommodation close to campus, so that she could access the resources she needed and

so that she could be close to the friends who studied with her. Upon realising that the bursary gave her the money late in third year, she decided to save a portion of the money so as to avoid not having money for accommodation and books at the start of the fourth year. Although she had moments, where she considered giving up, she continued to reflect on her circumstances and believed that the only way in which she could realise her concerns and her dreams was by completing her degree.

A further analysis of students' modes of reflexivity is presented in Chapter 9. The next chapter describes the journeys of civil engineering students.

Chapter 8 - Mechanical engineering students

This chapter presents the results of the T^2-T^3 stage for the final group of students, the mechanical engineering students, as they made their way through first year to fourth year. As previously, it begins by briefly introducing the backgrounds of the three students who participated in the study in order to account for their primary agency; this is followed by an outline of their concerns and projects. The subsequent sections describe the various students' deliberations about the constraints and enablements they had to overcome, as they made their way through each academic year.

8.1 Students' backgrounds

8.1.1 Nkanyi's background

Nkanyi came from Kwamashu township in KZN. She was the second of five children and the eldest girl, and as such, she had to look after her siblings when her mother went to work. Her parents had recently undergone what she described as a 'painful' divorce, which she attributed to her father's misuse of alcohol and his abusive behaviour towards her mother. She said that she was often a victim of his abuse. She described her relationship with her parents as 'distant', but indicated that, since the divorce, her relationship with her mother had improved. Her elder brother was unemployed and her three younger siblings were still in school.

Nkanyi described herself as 'withdrawn' from the activities in her community, stating that she did not participate in common activities, such as drinking alcohol and partying. She said that, despite many opportunities available to young people in the new South Africa, those living in the township seemed oblivious of them. She attended a HoDel high school outside Kwamashu because her parents believed that Indian schools were better than the local township schools; contrary to this belief, she found the teachers at the school unhelpful and sometimes demotivating. For example, she said that one of the teachers had discouraged her from applying to UCT, stating that she was 'not good enough'.

With regard to her choice of career, she indicated that she wanted to study something through which she could live out her dream of serving people. Her boyfriend at that time, who was studying engineering at UKZN, influenced her to study engineering. She decided to study mechanical engineering because she thought that through it she would be involved in

designing prosthetic limbs for war victims, something she became interested in when she read about this in magazines when she was still a child. She first applied to UKZN for mechanical engineering and geology and was accepted for geology. She then applied to UCT for mechanical engineering and medicine respectively, and was accepted for mechanical engineering through ASPECT.

She said that, owing to the unpleasant circumstances at home, she decided to accept the offer at UCT, as it meant that she would be more than 1,600 kilometres away from home. She indicated that she was happy to be accepted into ASPECT and was not worried that it would take her five years to complete her studies; instead, she regarded her acceptance as a blessing, as she had not met the minimum requirements for the mainstream programme.

8.1.2 Bonang's background

Bonang came from a small town of Mohale's Hoek in Lesotho. He described Mohale's Hoek as 'lacking infrastructure', something he indicated was common to many small towns in Lesotho. He was the second of two children. His family was generally educated; his father had a degree in Education, his mother a degree in Pharmacy and his sister a BComm degree from UCT. He described his family lifestyle as 'comfortable but not extravagant', as they had 'always been able to afford' to meet their needs. Bonang's father worked as a subject advisor in South Africa for many years; as a result, he managed to secure permanent resident status. Consequently, both he and his sister were also South African permanent residents.

Bonang described his grades in high school as 'average' and indicated that his performance did not suggest that he would one day study engineering at a prestigious university. According to Bonang, the 'big change' in his education happened when the family decided to send him to South Africa for part of his high schooling. His parents thought that, instead of following the A-level route, he would stand a better chance of getting into a South African university, if he completed his high school career in South Africa. He was thus sent to a boarding school, a move he believed was good, as it helped him to develop the habit of studying. Although his performance was near the top of his class, he believed that good competition in class might have encouraged him to do better. Bonang indicated that his spiritual life, which he referred to in detail during the three interviews, developed while he was at boarding school.

Bonang was interested in mechanical engineering for two reasons: firstly, designing cars fascinated him; secondly, he was interested in designing and manufacturing agricultural machinery for Lesotho. He applied to UCT and upon realising that his grades were not good enough for engineering, he decided to apply for architecture and mechanical engineering as his first and second choice respectively. His application was declined for both; however, through the intervention of his sister's friend, he secured a place in ASPECT. He was relieved that UCT had accepted him and not concerned that it would take five years to complete his studies.

8.1.3 Thebe's background

Thebe came from Mamelodi township in Pretoria. He was the last born of four children, and had two sisters and a brother. His father was a driver for a delivery company and was thus away from home most of the time. His mother was a tollgate cashier and this worried him, particularly because he felt that she was old and often had to work 'awkward hours'. He was also concerned that his father spent too much time on the road. He appeared to take many of the family's worries on his shoulders, indicating that he was the last hope to improve his parents' lifestyles.

Thebe's dream had been to become a pilot; however, since he could not afford pilot training, he decided to defer that dream and study mechanical engineering instead. He was accepted at both UCT and at Wits. He accepted the offer at UCT for three reasons: firstly, UCT had offered him accommodation, while Wits had not. Secondly, UCT had offered him financial aid, while Wits was yet to respond. Thirdly, he wanted to study in Cape Town so that he could start afresh, far away from his former high school lifestyle.

It was only when he arrived at UCT that he realized that he had in fact not been offered accommodation. He explained that the letter he had received from UCT had indicated that he was offered accommodation at one of the residences. Upon his arrival, however, he was informed that his application for accommodation had been rejected. For the next two weeks, he persisted and pleaded with the residence to accommodate him, until they converted a storage room to accommodate him and another student in a similar situation. As a result of these challenges, he remembered very little about orientation week.

8.2 Students' concerns and projects

Nkanyi revealed that her passion was to serve helpless people and to be part of the solution to the world's problems. As such, her ultimate concern entailed being a problem solver who could effect change:

I know that definitely I want to be a problem solver; that is definitely one of my dreams, to be a problem solver and effect change. I want to be part of a team that does something tangible and is accountable. I want to be part of people whose task it is to alleviate problems. [Nkanyi's interview, p. 14]

Her project was thus articulated as wanting 'to graduate' with the degree that she hoped would enable her to realise her ultimate concern.

One of Bonang's concerns was that he was the only one in the family who did not have a degree. Thus he hoped that a 'respectable' degree from a reputable university would ease the pressure on him and his family. However, his ultimate concern entailed improving his spiritual life and growing spiritually:

The most important thing is my Christian life; that comes first and everything else comes second. [Bonang's interview, p. 9]

His project was thus articulated as completing the mechanical engineering degree so as to enhance his spiritual life:

I would say for now the thing that keeps me going in mechanical engineering and my purpose is to take my degree and use it to enhance my spiritual life, not the other way round.... [Bonang's interview, p. 15]

Bonang's intention was to acquire skills in mechanical engineering and use them in designing agricultural machinery in Lesotho. He believed strongly that people should grow their own food.

Thebe's ultimate concern entailed wanting to be independent from his parents and to provide for their retirement. Although engineering was not his dream, he believed that it was the way in which he would best realise his concerns:

My dream was to be a pilot, so I cut my dream and decided to do engineering, not because I loved being in engineering. I had a sense of that, but engineering was a platform for me to get somewhere in life. [Thebe's interview, p.14]

His project was thus articulated as completing his engineering degree.

8.3 Students' deliberations about the first year

8.3.1 Nkanyi: First year

Nkanyi was beaming when she recalled her first week at UCT and described it as 'larger than life'. She indicated that being at UCT was just what she needed, a break far away from her family circumstances. She seemed to have adjusted well socially; she met friends while she was in transit accommodation, and had remained friends with them.

I made good friends. It was really good; I really enjoyed my first week at UCT. Just being in a new place… It was a huge experience for me. [Nkanyi's interview, p. 12]

Despite the seemingly good start she had at UCT, Nkanyi indicated that, as early as orientation week, she had already realised that some mainstream students had negative perceptions about ASPECT students and had made comments that she found intimidating.

With regard to her studies, she indicated that she adjusted well, which she attributed to the fact that the ASPECT lecturers were approachable and willing to help students. In particular, she enjoyed the Mathematics 1 course, because the lecturer set regular assessments that enabled her to keep up. She said that owing to inadequate preparation at school, she found physics difficult. As a result, she failed most of the Physics 1 assessments in the first term; her situation improved in the second term, when she started to work with other students:

First term I failed a lot of Physics 1 assessments and in the second term I started passing because I started working with others. In first year, it is nice to work with people because… I don't know, it was just a nice thing; people worked together. [Nkanyi's interview, p. 29]

Nkanyi suggested that working with other students enabled her to understand the work better; however, at other times, she preferred to study on her own, as groups were not always productive.

With regard to the MechEng 1 course, although she said she found it 'enjoyable', she mentioned some constraints: Firstly, she said that mainstream students looked down on ASPECT students, which she found intimidating:

It was intimidating especially because there were divisions. The ASPECT students stuck together and the mainstream students stuck together and so it was... just going to the mainstream lectures always reminded you of your flaws…. I mean even in the group that I studied with there were mainstream students and they used to make fun of us. They'd laugh at us, they'd say 'ag shame, ASPECT people'. [Nkanyi's interview, p. 30]

She used the 'us' to refer to the ASPECT students in her class. She said that she only started to feel more comfortable when some of the students who had laughed at them started failing, while the ASPECT students were passing.

8.3.2 Bonang: First year

Bonang indicated that his initial experience at UCT was positive, partly because he already knew several people. He said that he was not a person of 'many friends' and as such, he found it generally easy to adjust to the university life:

I had a few friends; they were not many. But what I've noticed here at UCT is that people want to strive to have many friends and I don't know why… I came to understand that it is unnecessary to have a lot of friends, so when I came here, not having a lot of friends was not a problem for me. [Bonang's interview, p. 12]

Bonang was not offered accommodation at UCT; he rented a room in a flat of one of the senior students from Lesotho. He indicated that it was during his stay with the senior student that he was introduced to and became a Seventh Day Adventist.

With regard to his studies, Bonang indicated that being in ASPECT enabled him to adjust to first year easily; the fact that he had to attend fewer courses allowed him to spend more time on the Mathematics 1 and Physics 1 courses:

We had more time, more lectures on Mathematics 1 and Physics 1, it made it a bit easier to grasp every idea that was taught and to be able to apply it effectively because mainstream people are under pressure... they learn so as to pass the exam. [Bonang's interview, p. 18]

Bonang's statement implied that ASPECT students have more time to grapple with fundamental concepts, while mainstream students have to learn under pressure. Nonetheless, he suggested that the reduced load in the first year made him feel too relaxed and thus did not sufficiently prepare him for the increased load in subsequent years.

With regard to the MechEng 1 course, he indicated that the interaction between ASPECT and mainstream students in the course depended on how ASPECT students perceived themselves:

I think it has to do with what you think inside because you might get into a group and when people are speaking, you are shy because you think, 'I am under these people. They are above me and they know more because they are in the mainstream programme'. You even think that they are looking down on you. So those feelings that you have make you somehow not be able to participate. [Bonang's interview, p. 16]

He acknowledged that he felt intimidated by mainstream students, but said that it was 'normal' for a human being to feel that way, whenever they felt that someone was superior to them.

As indicated earlier, Bonang became a Seventh Day Adventist in his first year, and in the second semester, he decided to start observing the Sabbath. He explained what the decision entailed:

That means from Friday evening to Saturday evening I don't do schoolwork, I don't do anything. That's the first thing; the second thing is that my diet changed. I adopted a vegetarian diet. So those two things meant that I had to organise my time in the second semester.... [Bonang's interview, p. 19]

He explained that, although these changes implied that he had 'less time' to study than other students, he became stronger spiritually and depended more on God. He nonetheless acknowledged that changing to a vegetarian diet was challenging, as he needed to cook more than before. Bonang's spiritual journey is highlighted here, because it informed much of what he did in the rest of his studies. The influence of his spiritual life will be clarified as the narrative unfolds.

8.3.3 Thebe: First year

Thebe indicated that, when he got to ASPECT, he found it to be a 'restricting place'. He said that he had to make some major adjustments, when he learned what ASPECT entailed; he did not understand what it was until he arrived at UCT:

I came to ASPECT and I didn't quite get the knowledge of what ASPECT was. Most of us came here without knowing what ASPECT is. We thought maybe ASPECT is just one of the other courses or whatever. We got here, for a moment... I remember when they told us what ASPECT really is, and then most of us felt like we didn't belong in ASPECT. [Thebe's interview, p. 17]

He said that, after finding out what it entailed, he wondered whether ASPECT was worthwhile; he even considered going back to take up the offer from Wits. But he then reassured himself that, if other people could succeed through ASPECT, he too could. Although he accepted his situation, he and his friend decided to be a different kind of ASPECT student:

You know when you feel like you are the lost sheep, you do things differently. We used to just go to Cavendish [mall] during our free sessions and chill; sometimes we 'bunked' class. We were the only ones who were doing things that other people did not do. We were different. So people thought we were here to play…. [Thebe's interview, p. 36]

He remarked that ASPECT students tended to sit in one venue 'the whole day', which meant that they were defined by the venue. He and his friend decided not to limit themselves to the venue and explored other parts of the university.

With regard to his studies, Thebe explained that he and his friends had a 'different' approach in their studies; they were playful, they skipped lectures and they did not take their studies as seriously as their classmates did. He added that they often laughed when they failed assessments and told themselves that they would do things differently next time. He indicated that although they had a 'crazy' approach to things, they generally did well in their courses. He acknowledged that he managed his studies because his friend taught him how to think on his feet and how to strategize and study for examinations.

8.4 Students' deliberations about the second year

8.4.1 Nkanyi: Second year

Nkanyi indicated that she adjusted easily from the lighter load in her first year to the heavier load in second year; however, she pointed out two constraints: firstly, she observed that, even in second year, mainstream students continued to undermine ASPECT students both in class and in group work. She decided to ignore this, as some senior ASPECT students had advised her not to take it to heart. Nonetheless, she also mentioned that ASPECT students 'gained some respect' when some of them performed better in the Mathematics 2 course than some mainstream students had done.

Secondly, Nkanyi alluded to the 'bad' examination timetable as a reason why she performed below her expectation in one of her courses, Mech Thermos 1; although she had performed well in the course during the semester, the examination timetable limited her preparation time. Although she did pass the course, she felt that she could have achieved better marks. At the end of the second year, she had passed all her courses.

Apart from her studies, Nkanyi said that she became a born-again Christian, something that she regarded as a defining moment of her second year. She explained that this 'change' implied that she spent a considerable time reading the bible, as she 'grew closer to God'. Moreover, she indicated that her new faith helped her during a difficult period, during which she lost her bursary and had to apply for financial aid. She believed that God came through for her and said that it was His 'supernatural intervention' that enabled her to secure new funding.

8.4.2 Bonang: Second year

Bonang stated that, owing to what he described as an 'unbalanced load', he found the second semester of his second year more difficult than the first semester. Although his workload in the first semester was manageable, he found it very challenging when it increased substantially in the second semester. He believed that the load could be managed better if ASPECT students were advised to take an elective course in the first semester:

I would say it would be better to take electives in the first semester to get used to the load a bit, but people advise you not to do that; but your ASPECT advisors advise you to take those

things that they suggest because they say they are adequate for you …. [Bonang's interview, p. 18]

Bonang's remark suggests that, although he might have decided to take the elective courses earlier that year, he had been advised against it; this was something he found constraining about the ASPECT curriculum.

Bonang reflected on the two courses, in which he performed the lowest, Mathematics 2 and Mech Thermos 1. He explained that he failed Mathematics 2, because he found the course difficult and he could not finish his class tests. He acknowledged that, had he studied the course with other students and received help, he could have saved himself time and solved more of the problems. He adopted this strategy (i.e. to ask for help and to study together with other students), when he repeated the course in the following year and he passed it.

With regard to Mech Thermos 1, he echoed what Nkanyi had mentioned, namely, that the examination timetable was constraining:

The exam was very hard… I remember that I was writing it the next day, while the previous day I had a Mathematics 2 exam at 5pm. I knew I had failed Mathematics 2 and I was so sad. I've never been that sad in all my time at UCT.... [Bonang's interview, p. 30]

Bonang indicated that he wrote Mathematics 2 and Mech Thermos 1 on two consecutive days. As he felt 'crushed' after the Mathematics 2 examination, and needed to prepare for the Mech Thermos 1 examination, he said that he was 'lucky' that he passed it.

8.4.3 Thebe: Second year

Thebe indicated that, after he and his friend had a 'playful' first year, it was in second year that he realised the importance of the ASPECT year:

Honestly speaking, I think ASPECT was the greatest thing that happened to us. If we got into the mainstream programme in first year, we wouldn't have managed.... [Thebe's interview, p. 37]

He appreciated the first year in the ASPECT programme because, owing to a significant increase in the workload in his second year, he could no longer continue being playful:

That's when we became mature in our decisions and in what we think while we are here at UCT. We never had submissions in ASPECT, so in second year, we got an idea of what varsity is…. [Thebe's interview, p. 37]

He then explained how, as a result of a 'bad exam', he failed the Mathematics 2 course. He said that he had written a difficult Mathematics 2 class test towards the end of the semester, after which he decided not to attend the course lectures, as he though the remaining course content would not contribute a significant proportion towards the examination. To his surprise, however, he found that the specific content contributed about 60 percent to the examination paper. As a result of poor preparation, therefore, he failed the examination. He then decided to register for the repeat course, Mathematics 2A, which he passed at the end of that year.

At the end of the year, he had failed only one course and was thus able to proceed to third year.

8.5 Students' deliberations about the third year

8.5.1 Nkanyi: Third year

Nkanyi indicated that the third year had been her most difficult and frustrating year at UCT. Although she had put increased effort into her studies, the results did not reflect it:

What did I not do? Last year [third year] I worked. That was actually the one year where I worked and I didn't get the results. Especially because when I came to third year, I started to wake up… I think I tried too hard. Maybe if I'd just relaxed a little, like I'd done in the previous years. I just burnt myself out. [Nkanyi's interview, p. 16]

She cited some of the constraining academic and non-academic circumstances, in which she found herself. With regard to academic challenges, she related her experience in the Mech Design 1 course. She said that some senior students had informed her that the course was difficult and, as a result, she had decided that she was going to pass it on her first attempt. She then related a negative experience of her encounter with the course lecturer, Mr Hill:

I had a run in with Mr Hill [the lecturer] and I remember that day I cried the whole day actually after that incident. That's when I decided that I'm not going to repeat this course. What happened is that I went to ask him a question in his office. To him the answer was

obvious, but to me it wasn't. I'd done bits and pieces of the question. I just needed him to show me how everything comes together. When he saw that I didn't really understand, he started shouting at me and even banging on the desk and saying just a whole lot of hurtful things. He started saying that the way 'you people think is'... he wasn't saying the way you children think, he was saying the way certain type of students, black students, think is stupid because you think you can just get away with not even understanding.... [Nkanyi's interview, p. 18]

Nkanyi perceived Mr Hill's action as racially motivated. She explained that he offended and 'kept going on' until she started to cry in his presence. She said that he offended and humiliated her, because there were three white students who witnessed the incident. Upon realising that she was crying, she said he tried to quieten her and apologised. She said that it was after the incident that she decided that she would not repeat the course; she could not stand another encounter with Mr Hill.

I didn't want to see him, so for me to go through another semester of seeing him, I wouldn't have been able to do that. So I think that was a motivation for me. That pushed me more than anything. [Nkanyi's interview, p. 19]

With regard to her non-academic circumstances, Nkanyi indicated that third year was the year in which her parents' divorce was finalised. She described that divorce process as 'unpleasant', because her parents kept calling her to complain about each other. She said the situation became so bad that she decided not to answer calls from home. It was also during that time that the negative emotions from her father's verbal and physical abuse towards her re-surfaced:

I just had a lot of hatred and bitterness. I became a bitter person, extremely bitter; I really hated him.... [Nkanyi's interview, p. 17]

In addition to her parents' divorce, Nkanyi explained that she also ended a three-year relationship with her boyfriend who had become abusive:

He was cold and emotionally abusive… So I mean I stayed in the relationship for like 3 years and he started becoming physically abusive. That's when I said you know what, I'm not gonna be like my mom; I left him. [Nkanyi's interview, p. 24]

Her third year had thus been emotionally difficult to the point where she had negative thoughts about the future of her studies:

I didn't think that I was going to pass anything. I thought that I was going to get excluded. I thought that I was going to... that I was just going to be a failure and that everything that my father had said about me would come to pass and that I'd just be another statistic of a girl who comes from the township, who left the 'gang' and didn't make anything much of her life. I'd just had enough. [Nkanyi's interview, p. 26]

Nkanyi believed that it was through praying with her friend that she gained strength to 'make it through' the examination period. At the end of the year, she had passed six courses and failed three, and was thus able to proceed to fourth year.

8.5.2 Bonang: Third year

Bonang indicated that the first constraint he encountered in his third year was a further increase in the workload. He explained that, at that stage he realised that ASPECT had not helped him to reduce the workload in senior years. He thus questioned the role that ASPECT was meant to play and stated that if ASPECT was meant to help disadvantaged students 'to bridge the gap' between high school and university, then they were achieving that purpose. However, if ASPECT was meant to 'extend the curriculum' to help students to cope better with the workload, then it was not achieving that purpose, at least not in mechanical engineering:

It is even harder because you started with a reduced load. And now when you get to critical courses in third year, all of a sudden you are on a par with the mainstream students, and yet they started with a harder load. It puts you in a tight spot. [Bonang's interview, p. 37]

Secondly, Bonang indicated that there was often pressure in the courses at the end of the semester, stating that 'the system' did not afford students time to learn the course material properly. He said that in many courses, lecturers rushed to through the content to over more in limited time:

Bear in mind that they ask things they taught towards the end and they don't lecture those things properly, to be honest. I don't know why they do that here at UCT. Most of the things that appear in the exam like in Mech Dynamics 1, Mech Design 1; those 2 critical courses entailed things taught towards the end, and the lecturers did not lecture those properly. Even the tutorials you had to do them on your own for those sections that they were going to ask. [Bonang's interview, p. 38]

Bonang indicated that God 'came through' and enabled him to overcome these constrained circumstances. In the Mech Dynamics 1 course, for example, he explained how God helped him to pass: he said that in preparation for the course examination, he went to study, meditate and pray at the Rhodes memorial. He believed that it was through 'spending time with God' that he passed the examination:

In the exam, that concept that I focused on at Rhodes [Memorial] came out and I could answer it properly. I could write almost everything on it, then I left it at that. It would still worry me but to trust in God with it was the simplest way of dealing with the stress that came with it. And I got to pass the course, that's why I said it was God. [Bonang's interview, p. 26]

Bonang acknowledged that third year was the year where he felt the greatest impact of observing the Sabbath. Having decided not to study between Friday evening and Saturday evening, he decided to stick to his faith and 'kept God's command'. In addition to observing the Sabbath, Bonang lived by the church practice of 'the health message'; this implied that he needed to sleep on time and wake up on time. He explained that according to the 'health message', he was not supposed to study through the night until the early hours of the morning, as it could disrupt the next day. He admitted that he sometimes compared himself with other students, but realised that they were on different journeys:

I compared myself with them but there was a point when I said, OK I am not like these people. We are not in the same boat. I have to concentrate on my way of doing things and try to sort them out because I will never be like them in terms of their time and how they do things. So I think that was a breakthrough, because it gave me an understanding that, because whatever trouble or struggle that I'm coming across, I could focus on God and say, God I cannot do this alone...[Bonang's interview, p. 26]

Bonang said that in many instances through his third year, there was no evidence that he would pass, but he reminded himself to have faith, which he said 'does not work with physical evidence'. At the end of the year, he had passed eight out of nine courses and proceeded to fourth year.

8.5.3 Thebe: Third year

Thebe indicated that third year had been his most difficult year, both in his studies and in his life, and attributed it to academic and non-academic constraints:

You come across difficulties, and I feel like last year was that year for me. Throughout my life I've never experienced such in my life, especially my academic life, I felt this was too much.... [Thebe's interview, p. 21]

With regard to his academic constraints, Thebe failed the Mathematics 2B course twice in the same year. He explained that he did not understand the course properly in the first semester and subsequently failed it; but when he repeated it in the second semester, although he understood the course content, he made the mistake of studying through the night and not getting rest before the examination. As a result, he arrived 30 minutes late at the examination room and panicked. He subsequently failed the course for the second time that year, and had to repeat it in the first semester of fourth year.

With regard to the non-academic constraints, Thebe revealed that, firstly, the 18-month relationship with his girlfriend ended at the beginning of third year and that this negatively affected his emotional state. Secondly, during the second semester, his father was hospitalised for two weeks after sustaining injuries in a car accident. He was frustrated that his family decided not to inform him about his father's accident, stating that they did not want to 'worry him' before his examinations. While his father was in hospital, his uncle died in a car accident. The family decided to withhold this information from him. Moreover, about a week after his uncle's funeral, his grandmother became ill and had to undergo surgery, and again, the family withheld the information from him, claiming that they did not want to 'worry' him so close to his examinations. Thebe stated that he was 'stunned' by what was happening to his family:

I was like, why is this happening to my family? To think that all these years we were fine and suddenly just 2 months all these are happening, how is that possible?... Now I had to face up to my examinations. I don't know what happened to be honest… I think it added to my anxiety to just finish up and go home. Like let me just finish this, pick up my bags and go home. [Thebe's interview, p. 23]

He explained that, as a result of the circumstances in the family, he lost concentration in his examinations. At the end of that year, he failed 6 out of the 10 courses and was thus excluded. He then decided to apply to the University of Johannesburg so that he could finish a BTech, but his application was late. He then considered studying through UNISA, but struggled to find suitable courses. His last option was to appeal to UCT and, although he dreaded doing this, his mother encouraged him:

I remember that my mom told me that I should pray, like forget about anything and pray and then things will work out by themselves. Whatever you need, if you pray, you will get it. So I was like fine, what do I pray for? She is like just pray and then whatever that comes up is yours. Fine, I did that; I prayed. Then you know the appeal forms came through and I then filled those out and reapplied. I did that. But I told them [parents] that I don't see myself coming back to UCT. [Thebe's interview, p. 31]

He then found that, to his 'shock', UCT readmitted him and that he had never felt that 'lucky' in his life.

8.6 Students' deliberations about the fourth year

8.6.1 Nkanyi: Fourth year

After what appeared to have been a difficult period at the end of third year, Nkanyi expressed a loss of interest in studying engineering in fourth year:

I actually don't want do engineering anymore. I realise that obviously my reasons for doing it were flawed. I was actually just compassionate about people, you know. Ultimately, I am just a person who wants to help other people. I realise that I can be in a completely different career and still make an impact in the country. I don't want do engineering anymore. It is just a real pain right now to do this and I have to complete it and move on. [Nkanyi's interview, p. 3]

She indicated that she was no longer interested in engineering because she found it difficult; she felt that she was 'never really intelligent', suggesting that the process had frustrated her to the point where she questioned her ability to make it to the end:

I'm working hard, but I'm just not getting the desired output from my hard work. It is like, I'm there, but I'm just not there. I don't enjoy the work, obviously I see people as they get closer to their degree, they find their passion and they see where they want to specialise and I don't see that right now, to be honest. [Nkanyi's interview, p. 4]

When asked why she seemed to have lost interest in engineering, she explained that, when she first came to UCT, she had planned her life, but things had not worked out accordingly, and she felt 'frustrated and suffocated'. Although Nkanyi expressed these sentiments, her academic record did not suggest that things were as bad as she reported them to be. At the time of the interview, she had passed three out of the five first semester courses, but she remained adamant that she had lost interest. She believed that her experiences in third year made her 'not feel things anymore':

I'm here but I'm not here anymore... like it [third year] took a part of me... Last year, it was like my skin just became thick... Stuff could be going wrong and I wouldn't even flinch…. [Nkanyi's interview, p. 26]

She believed that the constraints she experienced, both academic and non-academic, contributed to her state of mind:

It really affected my entire being and I felt defeated. I felt very depressed. I remember, before I wrote the final exams, I was very depressed. I remember that for some time I had like a breakdown and a friend came over, he was there and I was just crying on the floor and I was falling apart and we prayed a little…. [Nkanyi's interview, p. 26]

She had also lost interest in the practical side of her studies; she no longer found 'what engineers do at work' as fascinating as she used to. Although Nkanyi expressed a loss of interest in engineering and in her studies, she ended the conversation by reiterating her commitment to push through until the end:

As hard and as painful as it is to finish it and to push myself and wake up every morning for lectures, I'm still going to finish it and then do what I want. There is no two ways about it, you just have to do it, you started it and you have to finish it. [Nkanyi's interview, p. 27]

She was evaluating her options, and was thus unsure of what she wanted to do once she had completed her studies.

8.6.2 Bonang: Fourth year

Bonang described similar constraints that he encountered in his fourth year as those he had mentioned in third year. Firstly, he complained about the pressure of the assessments at the end of the semester, stating that they did not allow students time to prepare adequately. Secondly, he complained about the pressured examination period, stating that he recently wrote six examinations for which he was unable to study properly. Moreover, he indicated that the time allocated for each examination session was also not enough:

The experience was that the time was not enough to cover everything that you'd want to cover for the exams. Even when you get to the exam, I think they ask too much in a very short space of time. It is not that you don't know those things, it is just that the timing makes you panic and you are not able to finish the questions that you need to finish… That's the experience that I got for every exam that I was writing. I couldn't finish any of my exams. [Bonang's interview, p. 34]

The pressured examination time slots left him little time to think; even if he could solve a problem, the time he had was insufficient:

In the exam I find that most of the time, you don't have time to think. You automatically write what you think is right, and if that is wrong, then you will not pass the exam. So I don't know; maybe UCT expect people to be fast thinkers, especially in the exam. They [UCT] don't expect you to think properly; they want you to be a fast thinker. [Bonang's interview, p. 35]

Bonang added that, if UCT's intention was to produce 'fast thinkers', then they were 'not missing the point', but if the intention was to produce graduates who could 'think things through in the 'right manner', then they were 'missing the point' by giving them highly

pressured examinations. He said he sometimes felt so time-constrained that he panicked and had to struggle to keep the balance between panicking, thinking and writing.

At the time of the last interview, Bonang was the only one of the three mechanical engineering students who was on schedule to complete his degree within five years. Whilst discussing the possible graduation in the following year, Bonang mentioned a potential constraint, namely, that he needed to complete two semesters of experiential work and he had struggled to find placement for it in companies:

It is not easy. Well, you can bypass it by getting a company that does not offer exactly what the department wants, but that would mean not doing it the right way. But if you want to do it the right way, then applications don't actually work because companies say they have their own students and that they are full. So they don't want any more students. [Bonang's interview, p. 33]

At the end, Bonang stated that he had faith that God would provide him with the required experiential work and that he would complete his degree.

8.6.3 Thebe: Fourth year

Most of the conversation with Thebe about his experiences of fourth year revolved around the constraining circumstances in which he found himself during his last examination period. Firstly, he talked about his experience of the day when he wrote two examinations in one day; he had to write a full year course and then immediately thereafter, he had to write the examination for the second course:

Thebe: *I didn't sleep the night before the two exams; I was studying.*

DM: But you had been studying for Mech Design 1[full year course] for a week…

Thebe: I was ready for Mech Design 1, if I had a break of more than 3 hours, I would have been fine, but it was just that I was tired; my brain was tired from just thinking. I could do the whole paper, but I needed time to relax and prepare; I didn't. I had another exam immediately afterwards. [Thebe's interview, p. 43]

Thebe explained that he finished the Mech Design 1 examination at 15:30 and started the Energy Conversion course examination at 17:00, indicating that he only had an hour and half between the examinations. As a result, he stated that he was 'just too tired' during the Energy Conversion course examination:

I didn't do half the paper because my brain was just too tired and I was not supposed to fail Energy Conversion; in fact, I was not supposed to fail anything, so that's the first problem. [Thebe's interview, p. 43]

In view of his exhaustion, Thebe spent the first 30 minutes of the examination 'staring' at the examination questions, as he could not write anything.

Secondly, Thebe expressed his despair at the difficulty he experienced in trying to get a DP for the Mech Dynamics 1 course. He indicated that, owing to a late assessment of the course, he struggled to find the lecturer to correct an 'unfair' marking by a tutor. He explained:

I think he [the tutor] finished marking the second test during the weekend before the DP was released. Mech Dynamics 1 exam was on the Thursday. The DP list came out on Monday. I got a DPR and I went to him [the lecturer], I sent him an email to explain the problem. I went to him and gave him my script, so that he could check the way it was marked. The tutor took away marks for nothing! I was not supposed to get DPR… but because he [the lecturer] didn't give me the time to show him that I have got marks, I ended up getting DPR and not writing the exam. I sent him two emails; I went to him four times and still he didn't give me the time…. [Thebe's interview, p. 41]

He said that the lecturer was unavailable on the Monday when the DP list was released and he had put a notice on the door that he would be available for two hours on the Tuesday. However, on the Tuesday, Thebe stood outside the lecturer's office and when the lecturer did eventually come, he told Thebe to come back later. Upon his return later, Thebe found the lecturer busy and unable to see him. He had sent the lecturer an email on the Monday and he could see that the email had been read but there was no reply. He indicated that all he wanted was to show the lecturer that the tutor had marked him unfairly, but he was not given time to do so. Eventually, Thebe could not write the Mech Dynamics 1 examination.

Thebe was very worried about his future at UCT; he was concerned that it had taken him too long to complete his studies and that each year it became more difficult and expensive to be at UCT. He was thus evaluating whether to abandon his studies at UCT, although he still had two more years to go, and apply to another institution. He felt that he had lost much time and had given up so many 'other things' during the journey, and he was not sure whether it was still worth it. He was also considering stopping his studies and finding a job, stating that, at the end of the day, he wanted to save money so that he could pursue his dream to become a pilot. He was considering taking a year off to pursue piloting through the SAA programme.

8.7 Conclusion: Modes of reflexivity

This chapter described the journeys of three mechanical engineering students, as they made their way from first year to fourth year at T^2-T^3. In the first section, the students' backgrounds were described; this was followed by a discussion of their ultimate concerns and projects. Students articulated their concerns and projects differently: Whilst Nkanyi wanted to graduate with an engineering degree because she believed that it would enable her to realise her ultimate concern of being a problem solver, Bonang wanted to complete the degree so that he could enhance his spiritual life and promote agricultural machinery in Lesotho. Thebe indicated that, although engineering was not his passion, he was pursuing the project because he believed that it would enable him to be independent from his parents and afford him the financial resources to support them for retirement.

With regard to their respective modes of reflexivity, Nkanyi's dominant mode appeared to be fractured reflexivity. Although it appeared that her dominant mode in the early years of her studies was autonomous, it appeared to become 'fractured' in response to the combination of constraints she faced in her studies as well as in her personal life. Despite the constraints of the mechanical engineering curriculum, she performed relatively well during the earlier years. She made strategic decisions when she confronted constraints; in first year, for example, upon realising that she was struggling in the Physics 1 course, she decided to join a study group with other students who helped her, and she was thus able to improve her performance. In another example, after a difficult confrontation with Mr Hill in the Mech Dynamics 1 course, she decided that she would do everything in her power to pass the course, so that she never had to face him again. During her studies, however, the increased academic pressure, the break-up of her relationship with her boyfriend and the divorce of her

parents left her discouraged and unable to decide on appropriate courses of action. She revealed that she had lost interest in engineering and that she wanted to 'move on'. However, she did not quite know what 'moving on' from engineering would entail.

Bonang's dominant mode appeared to be meta-reflexivity. His ultimate concern entailed pursing an ideal – his spiritual life. He emphasised that his spiritual life was his top priority, as he put God first, even under the most constrained circumstances. For example, he decided to observe the Sabbath, even though it significantly reduced the time available for studying. Although it became increasingly difficult for him not to study during the Sabbath, he decided to be subversive to the time constraints and applied his faith to the situation. Bonang believed that his God walked with him through the challenges of university. He was mindful of the constraints that the university imposed on him (such as stringent examination schedules and time-pressured examination papers) and, although he was often frustrated by the constraining circumstances, he remained steadfast by living according to his spiritual ideals without compromising his commitment.

Thebe's dominant mode can initially be described as autonomous reflexivity, but a combination of academic difficulties and family circumstances placed him in constraining circumstances; this led to his dominant mode becoming fractured reflexivity. At the time of the third interview, he did not know whether he would return to UCT in the following year. Thebe appeared to be confused as to the best course of action he needed to take. Firstly, he was considering abandoning his studies and completing them at another institution. Secondly, owing to financial constraints at home, he was considering stopping his studies altogether to look for a job. Thirdly, he was considering getting into the SAA pilot training. As a result, he could not successfully complete his deliberations with regard to the current project.

The analysis of the key findings and the discussion are presented in Chapter 9.

Chapter 9 - Discussion

In Chapter 1, this thesis started by looking at Barnett's (2007) broad questions about how we might understand students' achievements in higher education. Taking his questions as the starting point, the study used Margaret Archer's morphogenetic realist social theory to explore the agential relations between a selected group of students who were initially placed in an ADP in a faculty of engineering, and the structural and cultural relations constituting the engineering degree within a research-led South African university.

Following the morphogenetic approach, Chapter 4 described the ways in which the policies of post-apartheid South African higher education shaped the landscape for the university and how this in turn influenced the CEPs and SEPs that conditioned the situations for students at T^1. The Academic Development Programme became an established part of the university's response to a changing student population. However, the fact that ASPECT stretched the four-year mainstream curriculum over five years, and had to operate within the mainstream logic regarding university calendar, the scheduling of examinations and the rules of course progressions, created potentially constraining conditions for students when they entered the university at T^1.

Chapters 5-8 then described the ways in which students mediated the conditioning influences of the university's culture and structure at T^2-T^3. As indicated at the conclusion of Chapter 4, the decision to present the narratives according to specific engineering departments was so that the nuances of structural and cultural conditioning of each department and their resultant situational logics could emerge. The analysis of the narratives offered a close-up sense of the somewhat idiosyncratic outlines of individual trajectories; the family, schooling and communities background provided insight into the emergence of their primary agency. Their concerns and projects gave a sense of what they care about in their world, their personal identity. Furthermore, the analysis offered some emerging similarities about how they experienced the SEPs and CEPs and how they in turn mediated these using corporate agency and different modes of reflexivity.

This chapter provides a further analysis of the results presented in the previous chapters and attempts to identify possible generative mechanisms that underpin the outcomes for student agency. Section 9.1 draws together a summary of the ways in which students experienced the

CEPs and SEPs at T^2-T^3. Section 9.2 analyses how the students mediated the relevant CEPs and SEPs. Then, Section 9.3 explains the possible generative mechanisms that underpin both the university and the higher education landscape in general, and that shape the experiences of such students. The chapter concludes by commenting on the elaboration of agency in Section 9.4.

9.1 An analysis of the experienced CEPs and SEPs

The ASPECT students in this study, having not met the minimum entry requirements for the mainstream programme, were accepted into the university through a 'special programme' and were subjected to 'special curricula'. This section presents some of the ways in which the programme and the institution's CEPs and SEPs conditioned these students' experiences.

9.1.1 The CEPs experienced in the institution

The CEPs that positioned students differently within the institution were experienced as follows.

The CEPs experienced in first year

It has already been indicated in Chapter 4 that, owing to the history of educational disadvantage in South Africa, the majority of ASPECT students were black. As a result of the demographic intake of ASPECT, some students reported that they realised upon their arrival that ASPECT was for black people and some felt uncomfortable and marginalised as a result, and questioned whether they belonged in the institution. Therefore, the ideas that underpinned the programme and its resultant demographic intake had an unintended consequence of leaving students with the experience of exception.

Secondly, some students reported that mainstream students often marginalised them during group work in their Engineering 1 courses. They felt that their contributions to the group work were undermined, devalued and sidelined; this resulted in them feeling that they were 'not good enough', further increasing their feelings of self-doubt and inferiority. In Section 8.3.1, for example, Nkanyi stated that mainstream students reminded her of her 'flaws'. She said they used to laugh and 'make fun' of ASPECT students. Therefore, the unintended consequence of positioning the students in the ASPECT programme was that they were on

the receiving end of other students' negative and disparaging ideas about them, leading them to feel inferior and marginalised.

The CEPs experienced in subsequent years

The ideas that shape the ASPECT curriculum were based on extending the four-year engineering curriculum into five years, as detailed in Section 4.3.3; this meant that students straddled courses of different levels of study. As a result, they reported that when they transitioned from ASPECT to the mainstream programme, they found it difficult to identify with a mainstream cohort; they were neither first years nor second years in the mainstream programme. Consequently, some of the students felt that they did not belong, and some thus struggled to build fruitful relationships with students in the mainstream programme.

Some students indicated that the lecturers in the mainstream programme often treated them with a 'different attitude'; they did not treat them like 'any normal' student but 'looked past' them. One student interpreted a lecturer's attitude towards her as racially motivated. It may not necessarily have been the case that lecturers did subject ASPECT students to a different attitude or to racial prejudice, however, the very nature of the ideas that shape such positioning offers students the possibility to interpret situations as if they did.

The analysis of students' positioning, both in their first year and in subsequent years, suggests that the 'ASPECT label' resulted in the unintended consequences of subjecting students to other students and lecturers' preconceived (and mainly negative) ideas about them. It positioned them in a situational logic of constraining contradiction, in which the structure that enabled them to gain access to the university and the faculty, ironically served to exacerbate their feelings of exception. It is noteworthy that these experiences were not expressed by all the students interviewed, though, as some did say that ASPECT helped them to feel included.

9.1.2 The SEPs experienced in the institution

The SEPs that shaped students' experiences were identified as follows.

The extended/fragmented curricula

The first result of spreading the four-year curriculum over five years, which meant that students were straddling courses of different levels, was that the content of the various

courses could be misaligned. Eric highlighted an example of how this can happen in Section 6.3.3 with regard to the concept of 'significant numbers'. He indicated that the mainstream students had covered this concept in a chemistry course, while they, the ASPECT students in CivEng 1, were only registering for the chemistry course in their second year. The potential misalignment of course content suggests that the extended curricula may unintentionally disadvantage ASPECT students in this regard.

Secondly, some students reported that, as a result of registering for courses of different levels of study, they experienced unfavourable examination timetables; this was an issue that was raised across the board. The number of ASPECT students in mainstream programmes is relatively small and, as such, it is understandable that, given the university's constrained time resources, the largest number of students must be prioritised. However, their experience of being in the minority further intensified their feelings of hopelessness about the workings of the university. In Section 6.5.1, for example, Nombulelo indicated that 'the system is never really willing to change' to accommodate ASPECT students. Although some students exercised corporate agency successfully (this is discussed in detail later in Section 9.2.1) and requested a suitable examination timetable, this was not always possible.

Thirdly, the consequences of fragmented curricula were more devastating when students failed courses; this often resulted in lecture timetable clashes and tutorial clashes, and exacerbated problems with an already unfavourable examination timetable. For a student in the mainstream programme, failing a course might introduce clashes in their timetable. For an ASPECT student, failing a course multiplied these challenges and in some cases, it even increases the chances of extending the already extended curricula. In the year in which the interviews were conducted, the curricula for seven of the 12 students had already been extended to six years.

The introduction of 'decant' courses

The 'decant' courses were introduced in the EBE faculty for students who were not coping with the first semester of Mathematics 1 and Physics 1 in first year. Students were thus given another 'opportunity' to avoid failing the full course by repeating the first semester course content in the second semester. This structural change seemed a reasonable proposition; however, the findings of this study suggest that the implications of the 'decant' courses on the ASPECT curricula were not carefully considered. As a result, it was possible for students

who ‘decanted’ both of the courses to be academically excluded; in Section 7.3.3, for example, Zingiwe indicated that she was academically excluded at the end of first year, because she did meet the readmission criteria specified in Table 4.1. Although she had passed all courses except one, registering for two ‘decant’ courses implied that, in order to achieve sufficient credits for readmission, she should not fail a course.

The late assessments, shortened consolidation and examination periods

Some students reported that tests and project assessments were often administered late at the end of the semester; in some instances, this resulted in the delayed release of DP lists. Furthermore, they reported that lecturers often did not adequately cover the course content at the end of the semester. In Section 8.6.2, for example, Bonang complained that, owing to time pressure, lecturers left students to complete some course content and tutorials by themselves. He found this unfair because the course content that was taught at the end of the semester usually made up a significant proportion of the examination.

In addition to the pressure of late assessments and insufficient time to cover content, as was illustrated in Table 4.2, prior to T^1, the consolidation period and the examination period were reduced. The result of that structural change was that some students reported that the time they had to prepare for their examinations was insufficient and that they were pressured to such an extent that some believed they failed because of it.

The shortened examination period had arguably the most adverse consequences for students in this study; nine of them reported at least one examination period in which they wrote several examinations within very few days. In Section 5.6.1, for example, Ogone reported that he wrote four examinations in three days; as a result, he failed even the easy courses because he did not have the time to study properly. In Section 6.5.2, Thando responded to the pressure he felt as ‘sort of a gamble’, as he had to prioritise the courses he could not afford to fail.

The 'no supplementary examination' policy of the EBE faculty

The consequences of the fragmented ASPECT curricula and the reduced assessment periods were further exacerbated by the EBE faculty's policy against supplementary examinations[9]. Some students indicated that this disadvantaged them because they did not get a second chance. The EBE faculty policy against supplementary examinations positioned all EBE students differently compared to students in other faculties; however, it is argued here that this potentially constrained ASPECT students even *more* so than others because they were already following fragmented curricula.

The analysis in this section detailed how the combination of CEPs – the ideas that others held about ASPECT students – and SEPs – the fragmented curricula, the 'decant' courses, the reduced assessment period and the EBE policy against supplementary examination, all created a situational logic of constraining contradictions for students and consequently exacerbated their experiences of marginalisation and exception. Nevertheless, as Archer suggests, structure and culture only act to condition the situations for agents; therefore it was up to the students to exercise their personal emergent properties to mediate the conditioning effects of the CEPs and SEPs they encountered and to pursue their defined projects. The details of how the students mediated the conditioning influence of structure and culture were presented in Chapters 5-8; Section 9.2 provides an overview of the key findings on agency.

9.2 Key findings on agency

Students' concerns, projects and deliberations were described in detail in Chapters 5-8, with each chapter devoted to students within a specific engineering department as motivated above. This section now looks across these different contexts to address the question: in light of the generative powers of CEPs and SEPs outlined in Section 9.1, what avenues were available for them to 'keep going'? In Archer's terms, in what ways did the students mediate the SEPs and CEPs, as they pursued their projects? This question is addressed in terms of two PEPs: the achievement of corporate agency and the modes of reflexivity.

[9] At the time of this study, the EBE faculty did not allow supplementary examinations except for the 'service courses', such as mathematics, chemistry and physics in first year.

9.2.1 The achievement of corporate agency

Based on the data presented in Chapters 5-8, it can be seen that some students exercised corporate agency, in that they acted together strategically to bring about favourable outcomes. In Section 7.5, for example, Katlego and Pitso organised themselves strategically to overcome the potential constraints of the ASPECT curriculum for electrical engineering. Upon recognising the ambiguities in the curriculum, they decided to apply for concessions to register for courses that they were not yet allowed to do. They decided to circumvent potential constraints in subsequent years by registering for 'difficult' courses first; they did this so that, if they failed, they could repeat courses without prolonging their curriculum. Katlego and Pitso's collective action indicates that they were not students to whom 'things happened'; they made things happen.

Another example of students' exercise of corporate agency was described in Section 7.5.1, when a group of five students, including Katlego and Pitso, collectively strategized to challenge an unfavourable examination timetable. They sent an email to the examination office and requested adjustments to the examination timetable. When their request was unsuccessful, they did not give up; instead, they persisted through the ASPECT coordinator until the unfavourable examination timetable was changed in their favour. As a collective, the students thus organised themselves and acted successfully to overcome a potential constraint.

The final example in which students exercised corporate agency was described in Section 5.6, when Ogone and Dyllon acted strategically to bring about improvements in their academic performance. Ogone and Dyllon experienced many challenges in the first three years; specifically, they struggled to find and maintain fruitful study relationships with other students. At the start of fourth year, however, they decided to form a study group together with another student in chemical engineering; the three studied together and helped each other. When the group could not solve a problem, they either asked other students or set up an appointment with the lecturer – this was something that Ogone and Dyllon had not previously attempted on their own. The collective function of this study group thus seemed fruitful for its members; as Ogone indicated, they passed courses that many students in the class failed. Together, they overcame the constraints that they found difficult to confront as individuals; they became resilient. Ogone and Dyllon reported that, as a result of the group, they found fourth year 'better' than the preceding years.

9.2.2 The primary agents and their modes of reflexivity

Many students in this study remained primary agents; they learned to live within the constraints of the institution, albeit without an articulated say in the remodelling of its structure and culture. Archer (2007) asserts that, although primary agents do not have an articulated say, this does not mean that they do not have an effect on the system; instead, their effect is aggregate. They 'carry on' to pursue their projects within the confines of the system. She states that '…it is precisely how they carry on innovatively, which serves to extend the rule specification to these tracts of society' (Archer, 1995, p. 259). As such, the concluding sections of Chapters 5-8 specified how students carried on and mediated the potential CEPs and SEPs, as outlined in Section 9.1, through their different modes of reflexivity. Based on the re-contextualised use of the modes of reflexivity in this study, which were outlined in section 3.4.3, Table 9.1 presents a summary of students' modes of reflexivity. It is important to emphasise that these modes are based on students' dominant stance towards constraints and enablements, while pursuing their current projects; their modes of reflexivity may have been different in the past and may also be different in the future.

Table 9.1: Summary of students' modes of reflexivity

Modes of reflexivity	**Stance towards institutional constraints**	**Students in this category**
Communicative	Evasion – these students tended to avoid some institutional constraints because they believed that they could not influence the system on their own.	Dyllon
Meta-reflexive	Subversive – these students pursued their 'ideals' amidst the institutional constraints.	Bonang
Fractured	Lack of personal stance – these students were so constrained that they were currently uncertain about how to act in relation to their futures. They were 'going with the flow'.	Tebogo Nkanyi Thebe
Autonomous	Strategic – these students did whatever it took to overcome the conditioning effects of structure and culture. Some of their strategies included working in groups, applying for concessions, finding accommodation closer to campus, and turning to top students for help.	Eric Katlego Nombulelo Pitso Ogone Thando Zingiwe

Table 9.1 shows that autonomous reflexivity was the most prominent response among this group of students; this is a likely response, considering that the CEPs and SEPs established above depicted a very constrained environment. Furthermore, some students felt so constrained that their modes of reflexivity were temporarily displaced to 'fractured' reflexives. However, even in their state of 'fracturedness', they persisted and continued with their studies. It was unclear whether they would persist in the future, but thus far they had persisted against the odds.

This section highlighted the role of two personal emergent properties: (i) the achievement of corporate agency and (ii) reflexivity, in examining how students successfully mediated the conditioning influences of the CEPs and SEPs. The achievement of corporate agency – as an emergent property of a collective – indicated that students were collectively able to challenge some of the institutional constraints they faced. They articulated their grievances and decided on courses of action together. Those who remained primary agents still had to carry on within and despite their constraints, and some of their stances towards the constraints have been categorised in terms of the modes of reflexivity. However, they did not realise the potential effects of collective influence that they could have on the system.

9.3 Causal mechanisms beyond ASPECT

Thus far the analysis has elucidated the generative powers of CEPs and SEPs and how these were mediated by the students' PEPs. The situations in which the ASPECT students found themselves suggest that they occupied a marginalised position in the university. This is not to suggest that all the ASPECT students felt marginalised; indeed, many students made the best of their situations. The retroductive question is: in light of the institution's stated mission (UCT, 2008b) to:

- 'strive to transcend the legacy of apartheid in South Africa and to overcome all forms of gender and other oppressive discrimination;
- be flexible on access, active on redress, and rigorous on success;
- promote equal opportunity and the full development of human potential.'

why is it that this group of students, given that they overcame great odds because of their historically disadvantaged educational backgrounds, experienced such constraining circumstances and marginalisation at UCT? What mechanisms underpin such experiences?

To address these questions, the following subsections consider possible mechanisms that underpin students' experiences.

9.3.1 The structural and cultural positioning of ADP at UCT

It was indicated in Chapter 4 that, when the UCT management looked for 'more time' within the academic year calendar, it resulted in the shortening of undergraduate assessment time; this went ahead despite clear evidence that it would not benefit undergraduate students. Moreover, it indicated that in an academic year calendar with limited time, 'more time' for other university activities (research) could be recovered from the time spent on undergraduate education. Others have reported the tension between undergraduate education or 'teaching' and the research activities at UCT, suggesting that the criteria for promotion have historically valued research output (Kloot, 2011; Kotta, 2011; Luckett, 2010). These studies reported that academics often had to prioritize one activity over the other.

In addition to other's findings, the results of this study suggest that there exists a further tension between ADP and its positioning at UCT. It was argued that the fragmented curricula positioned students differently. ADP prioritises teaching and learning activities; as a result, when ADP students enter the mainstream programme, they are presented with a different logic to that of their foundational provision year. In Archer's terms, the ADP students enter a different ideational space, characterised by 'constraining contradiction', the logic according to which students must *compromise* to survive.

The fact that some students understood some of their marginalisation as resulting from racial issues was not surprising because, given the historical context of South Africa, racial classification still produces causal influences. Kotta's (2011) findings suggested that black students in a mainstream engineering programme felt marginalised mainly due to differential informal access to lecturers. The findings of this study extend her findings to shed light on some racial experiences of ADP students, who not only carry the burden of experiencing racism, but also carry the 'ASPECT label' – the 'I am not good enough at UCT' label. The implications are that there exist 'exclusionary practices' in the university, which exacerbate the constraining circumstances for ADP students.

9.3.2 Mechanisms beyond UCT

The global expansion of higher education and the resultant breakdown of 'exclusivity in university education' (Maton, 2005) has had many challenges and South Africa is not unique in this regard. As Maton (2005) indicated, the notion of the 'new student' in the UK resulted in the establishment of the 'new universities', which he argued was a way in which traditional universities 'refracted' external pressures to transform. The common reference to the 'new student' as 'non-traditional', 'under-prepared', or 'minority' in the UK, USA and other parts of the world suggest that the universities generally view such students as 'lacking' and needing to be 'fixed'. In South Africa, the adoption of the ADP has largely been the way in which the universities have 'managed' students' 'deficits'.

It is argued here that the establishment of ADP, although it has helped universities widen access to students from historically disadvantaged educational backgrounds, has ironically served in some ways to perpetuate the 'deficit' view of students. In particular, it is argued that the historically white universities have made strides (structural morphogenesis) over the past 30 years to admit students from historically disadvantaged backgrounds; however, the dominant view of students as 'lacking' and needing to be 'fixed' continues to keep the ideational space unchanged (cultural morphostasis). It is the lack of an 'ideational shift' about what these students can achieve that continues to keep them marginalised. In order to substantiate my assertion, I re-visit the conditions under which black students entered the historically white universities in the early 1980s.

Boughey (2010) distinguishes between three phases of academic development movement in South Africa: the 'Academic Support' phase, the 'Academic Development' phase and the 'Institutional Development' phase. She points out that these phases are separated for analytical purposes, but in reality, the ideas that shape each phase exist in other phases. Roughly, the 'Academic Support' phase refers to the discourse of 'support' for black students that was dominant in the early to mid-1980s when the number of black students admitted at white liberal universities was small. In the late 1980s, however, with the looming political transformation, the dominant discourse shifted from that of 'Support' to 'Development', based on the recognition that universities would need to transform to cater for the black majority. The idea here was that universities needed to transform through staff and curriculum development. The third phase, 'Institutional Development', came in light of the

need for universities to be more 'efficient', in line with the structural and cultural shifts that came in the post-apartheid era.

During the 'Academic Support' phase of the early 1980s, the concern at white liberal universities was to address equity in their student population and, as such, they provided 'support' to a small number of black students through tutorials and outside-mainstream interventions. The interventions were meant to assist students to increase their chances of success in the mainstream programme; in other words, the discourse at that time was about students *fitting* into the mainstream programme. Black student were perceived to be 'lacking', to have 'deficits' that could be 'fixed' in line with mainstream requirements. This 'deficit' view meant that students needed to transform in order to make it, whilst the institutional culture remained intact. Smit (2012, p. 377) problematizes this view of students and argues that it 'applies a narrow pathology-seeking assessment to groups of people and fails to recognise individual strengths'. Moreover, she argues that this view acts to 'perpetuate stereotypes' and 'disregards the role of higher education in the barriers to student success'.

Even though the term 'Academic Support' has been changed, the 'deficit' view of students has largely remained unchallenged. This study has shown that the unintended consequences of this ongoing view of students, particularly in relation to ADP, have been devastating for some students. It echoes Tema's (1985) assertion, as cited in Smit (2012, p. 373) that the ADP students:

> See themselves as survivors of an inferior schooling system, as strong, successful individuals, who have beaten the system and who, in many cases, carry with them the hopes and dreams of families they leave behind. These students arrive at higher education institutions and are told, in effect, that they stand very little chance of succeeding, that they are lacking in a number of aspects and that they have to 'catch up'. They are marked and separated from the 'mainstream' by virtue of their deficiency and their 'other-ness' is reinforced. In these ways students are in effect alienated from the very system they have worked hard to be part of.

The separate programme to which these students are subjected continue to suggest that they need to be 'fixed'. Mabokela (1997), cited in Akoojee and Nkomo (2007), suggests that the underlying assumption in these programmes is that black students are 'inherently deficient'.

Moreover, Mabokela suggests that this view of black students 'has the potential not only to stigmatise black students as inferior, but also to impede the ability of these universities to critically interrogate the relevance of their academic programmes' (Mabokela, 2000, p. 147, cited in Hlalele & Alexander, 2012, p. 492).

This study has shown that the unintended consequences of the 'deficit' view of students in higher education, if left unchallenged, will continue to perpetuate inequalities among students. To conclude this section, it is important to indicate that universities in South Africa not only need to accommodate black students from historically disadvantaged educational backgrounds successfully for the purposes of global 'knowledge economy', but also to address the injustices of the history of exclusion. As such, universities need to earnestly examine their practises and how they in turn serve to exclude students from historically disadvantaged backgrounds. As Barnett (2007) puts it, higher education in South Africa and elsewhere in the world needs an 'ontological turn' in its views about student diversity.

9.4 Reflections on the morphogenetic approach

In the introductory chapter it was noted that the literature on student learning and success in higher education has been dominated by perspectives focusing either on approaches to learning, academic literacies, or student persistence. Even the latter somewhat broader framing suffered from a conceptualisation of the phenomenon in terms of atomised variables. This study thus contributes to the literature by providing a complex explanatory account that moves away from identifying 'factors' and 'deficits' to an account that considers both the students (agential) and the university (social relations) in student success, not as variables or factors, but as causal properties that interplay temporally to produce a result either of morphogenesis or morphostasis. It is thus important to reflect further on what the morphogenetic social theory and its related concepts have enabled this study to accomplish.

Sociologically, 'student persistence and success' in a university are characterised in terms of the tensions and dynamic relationships between 'structure' and 'agency'. Accordingly, Archer's notion of analytical dualism offered a non-conflationary theory in which both aspects of social life are separated temporarily, for analytical purposes, to examine the interaction between their respective properties. The morphogenetic sequence offered the tools to analytically break the analysis into emergence – interplay – outcome.

At the end of this study, the question that one should to ask is: What is the outcome for agency? The outcome is stated as follows: Although students in this study arrived at T[1] as 'survivors' of their historically disadvantaged educational backgrounds, the unintended consequence of their structural and cultural positioning at UCT served to perpetuate the 'deficit' view of them and, as such, intensified marginalisation and disillusionment among some of them. Although they were close to achieving their goals, through the successful pursuit of their projects, they were largely ready to close this chapter of their lives and to 'move on' from these disempowering experiences.

Had this study identified 'factors' that influence student success or limited itself to student 'deficits', the rich explanatory account that it rendered would not have been possible. Here we have an analysis of students who were on the balance 'successful' in the programme, yet their experiences of the programme are characterised by marginalisation. The analysis has held up for scrutiny not only their coping strategies but also the structural constraints of the programme which has fostered these, as well as the situational logics of the institution and what this means for the positioning of students on an Academic Development Programme.

Chapter 10 - Conclusion

This study was located during a period of rapid expansion in higher education, which coincided with a period of intensified globalisation. It took place at a time when universities across the world were grappling with issues that resulted from widening participation. Starting with Barnett's (2007) question about how students persist through their studies, despite facing challenges, and Ashwin's (2009) call for a robust theoretical frameworks for research in teaching and learning, this study sought to explore and explain the phenomenon of student persistence in higher education. The study explored the journeys of students who had not met the minimum entry requirements for the mainstream programme, and who were thus admitted through an Academic Development Programme, in their studies in engineering.

Given the colonial and apartheid history of South Africa, most of the students who were admitted to their studies through the ADP were from 'historically disadvantaged' educational background and were largely black. Moreover, given that, nationally, about 32 percent of black students complete the engineering degree in five years (Scott et al., 2007), their persistence and success in higher education is important for both the redress of injustices of the past and for the developmental needs of the country (DoE, 1997).

Underpinned by Bhaskar's realist philosophy of social science, the study took a sociological approach and used Margaret Archer's morphogenetic social realist theory to explore the interaction between the university (social relations) and the students (agential relations). Archer separates 'social relations' into structure (the relations between material resources) and culture (the relations between ideas, theories and propositions). The morphogenetic approach and its related concepts were detailed in Chapter 2; from this perspective, the interaction between the university and the students is regarded as the interaction between their respective emergent properties.

The morphogenetic approach allows for the separation of structure, culture and agency analytically into a sequence *emergence – interaction – outcome* (Archer 1995, p.168); these are separated temporarily so that the interplay between their respective emergent properties can be explored. It posits that structure and culture predate the actions of agents who transform it. As such, structural and cultural emergent properties condition the situations in which agents find themselves. Furthermore, agents' personal emergent properties, such as

corporate agency and reflexivity, allow them to deliberate on their courses of actions. At the end, the morphogenetic approach allows for comment on the outcomes of the interaction, whether there has been change (genesis) or stagnation (stasis). The crucial aspect of this study was thus how the university's social structure facilitated change in the students' agency. The research question was thus formulated as follows:

How did ASPECT students' personal emergent properties mediate the potentially constraining or enabling structural and cultural emergent properties they encountered, as they pursued their projects to reach the fourth year of their studies?

The study employed a case study research design and utilised Margaret Archer's morphogenetic approach as a methodological and analytical tool. Three interviews were conducted with each of the 12 ASPECT students in the fourth year of their studies. Three students represented each of the four engineering programmes (chemical, civil, electrical and mechanical engineering). Through the interviews, students' backgrounds, experiences and reflexive deliberations were explored. Through the process of abduction, the interview findings were described in Chapters 5-8. In addition to the interview data, selected university documents were analysed to establish the emergence of the structural and cultural emergent properties; these were presented in Chapter 4.

The study established that the university's structure and culture conditioned students' projects in the following ways:

1. **The positioning of students in a separate programme** shaped their experiences of being marginalised; it exacerbated their feelings of 'not being good enough'. The fact that the programme generally caters for black students worsened their experiences of racial prejudice.
2. **The fragmented extended curriculum, although well intended,** served as a potential constraint to students; as they often straddled courses at different levels of study, they experienced timetable clashes and unfavourable examination timetables.
3. **The university's stringent assessment context**, which includes late assessment tasks at the end of a semester, the reduction of the consolidation period, and the shortened examination period, all served as potential constraints to the students. This resulted in students being under extreme pressure and often becoming disillusioned.

Although the findings suggest that students found themselves in extremely constrained circumstances, they persisted by means of the following:

1. **Achieving corporate agency**: as corporate agents, students were able to articulate their concerns collectively and to take strategic action to overcome potential and actual constraints. They were able to act against potentially constraining examination timetables and approach lecturers for help, which some of them indicated that they could not do on their own.
2. **Exercising their personal powers of reflexivity**: As individuals, students employed various modes of reflexivity in innovative ways to overcome the potentially and actually constraining circumstances.

Through a process of retroduction, it was found that the idea of a separate and extended curriculum ironically positioned students within a situational logic of constraining contradictions. It subjected the students to a 'deficit' view in which they were treated differently. It is argued that, although the ADP facilitated the inclusion of historically disadvantaged students in the university, their positioning in the programme served to perpetuate their marginalisation and exception.

There still remains a need for further research into the ways in which the background of students shapes their internal conversations, their modes of reflexivity and their persistence in pursuing success, though this study has begun to make a contribution in this regard. The study had its limitations in being confined one broad disciplinary area (engineering) and one institution. It followed a single cohort of students in the senior years of an Academic Development Programme, and used their reflections on their experiences to produce a tracking of the development of agency over this period. This complements similar work done with engineering students in the same institution (Case, 2013; Kotta, 2011). It will be important to see how this research framing translates to other disciplinary and institutional contexts. Moreover, longitudinal work, where possible, has the potential to offer more detailed analyses. In this regard, it will be useful also to analyse students' journeys post-graduation.

The findings of this study and the application of Archer's theoretical framework have several important implications for higher education practice. Firstly, it has been shown that the results of historical decisions can have unintended consequences for the present. Thus, the

way in which higher education addresses the injustices of the past may ironically serve to constrain the current agents that it hopes to assist. Specifically, separate curricula that are intended to address differences may in fact constrain students to such a degree where they feel marginalised and disillusioned; and as such, higher education needs to reconsider the idea of separate interventions, as their inherent situational logic appears to work against some of their fundamental goals. Most importantly, this study has shown that, despite the odds, students were able to overcome many obstacles. Therefore higher education needs to shift the thinking from the 'deficit' view of students towards one of empowered students who can reflect positively on their circumstances and act in ways that enable them to persist against the odds.

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Appendix 1: Interview schedule

Table A1: Interview schedule during fourth year

	Interview 1		Interview 2		Interview 3		Other info
Pseudonym	**Date**	**Time**	**Date**	**Time**	**Date**	**Time**	**End of 4th year results**
Dyllon	04-Aug	13:00	29-Sep	13:00	16-Nov	12:00	Passed 6, failed 4
Ogone	24-Jul	14:00	07-Sep	9:30	16-Nov	9:00	Passed 8, failed 2
Tebogo	04-Aug	11:00	27-Sep	13:00	15-Nov	9:00	Passed 2, failed 5
Eric	31-Jul	13:00	15-Sep	13:00	12-Nov	8:30	Passed all 9 courses
Nombulelo	30-Jul	13:30	12-Sep	11:00	15-Nov	11:00	Passed 9, failed 1
Thando	08-Aug	10:00	12-Sep	13:00	11-Nov	12:00	Passed 7, failed 4
Katlego	26-Jul	13:30	24-Sep	10:00	09-Nov	12:00	Passed 9, failed 2
Pitso	26-Jul	12:00	09-Sep	12:00	09-Nov	10:00	Passed all 9 courses
Zingiwe	27-Jul	14:00	20-Sep	14:00	11-Nov	15:00	Passed 8, failed 1
Bonang	27-Jul	15:00	08-Sep	9:30	16-Nov	13:00	Passed 10, failed 1
Nkanyi	23-Jul	13:00	25-Sep	13:00	16-Nov	17:00	Passed 8, failed 3
Thebe	30-Jul	15:00	10-Sep	14:00	16-Nov	15:00	Passed 6, failed 4

Appendix 2: Interview data

Example of an interview conversation: Ogone's interview 2, his experiences in first year

Italics (the interviewer), Normal (Ogone)

Ogone, from the first interview, the whole thing about studying engineering, in the first interview you mentioned that you didn't know much about engineering, that the only thing that you remember was that people used to say that when you studied engineering there is lots of money there. But is that still the reason why you are into it?

(Laughs), Yoh, Ja now I have already started so there is no going back. There has been so much money paid to it, like financial aid has paid so now don't know, I've learned to love it. At first I just came for the love of money, but now money is no longer my focus.

But why was it so important that you did something where there is money?

Because like you know, when you are in high school you think that if you have all the money then you'll be happy and all that stuff. I'm mean when you are at varsity you get to see that money is not really something that would make you happy. There are many things that are involved. So it changes over time and you start to see that actually it doesn't really make you happy. So, now I'm just doing it...I actually love chemeng, l love it now.

Learning to love it, do you still see yourself becoming a chemical engineer or do you see this degree as a route to somewhere else.

Oh no I have to get this degree because I've gone through hell (we both laugh). So I cant just go through hell and leave it.

Ok, now take me through the 'hell' then, take me through the hell from first year. I think at first when we started we talked more about just after the first 2 weeks, you mentioned that those were the most challenging in adjusting. One of the things you mentioned was having to walk from College House to Marquad and sometimes getting lost on your way back. From

that going to ASPECT, we've talked a bit about ASPECT and the first meeting and meeting the other guys there. But now today I want to hear about the hell (both laugh); I want to hear as much about the hell as possible. When did it start? What was it like? And what was it? Tell me everything. For the next 5 to 10 minutes let's focus on the first 2-6 months.

Oh the first 2-6 months… hell… like I said in the last interview, the first 2 weeks were the most challenging. Like I said I was not comfortable with speaking with other people. I felt more comfortable when I spoke in my own language with other people; I was used to it. Here it was different and the other thing is that I was far away from home and I was also shy, like really shy so it was hard for me to make friends and get to know other people. Like I also told you, I only knew Vincent. He was doing second year so he had his own problems. I think the first week of lectures or so, in Chemistry I was not used to PowerPoint slides and everything so when you get to Chemistry lecture they use PowerPoint and in matric you were like "I know chemistry", but when you get here you realise that you actually don't know anything. They cover new stuff and it is quite challenging to adapt to that. They move quite fast; at school you spent time in one section and go through things slowly, but here it is different. You just come to class, today you do this and tomorrow you are on to something else before you got the concepts from the previous day. So Ja, it was challenging. And the other part is that you attend lectures from morning until afternoon then afterwards you go back and you are tired and you have to study. So by the time you have to study you are really exhausted. And then you know you have Chemeng and you have tuts, Ja that was just stressful. So that was a whole difficult part of it, adopting to lectures and coping with the work was...ok Maths was ok because it was ASPECT, Dr Smith was quite good, she was more of like a teacher than a lecturer. So with her I felt more comfortable. I was coping with Maths. Chemistry was the issue because we did it in mainstream so it was quite fast.

And apart from being presented with PowerPoint and all, what else did you find difficult in the Chemistry experience in those first couple of weeks?

Also the material itself. I mean there are a lot of concepts that you have to know. And for some of them it was not easy for me to just get it by just looking at it and get it. I didn't quite get it quickly; it took time for me to understand it. Although we had lecturers that were good but it was like quite hard for me to really get it. And the other thing is that I was working alone and that made things even more difficult for me; I had no one to talk to, like study with..

But why was it like that at the beginning time, why was it…?

That's because for me it was difficult; I was shy, very very shy to talk to other people and to actually study with them. I thought ok if don't understand this, and if he understands it, how will he look at me? He'd think 'this guy doesn't know anything and all that stuff', and I just thought that and that's why I found myself working alone in first year.

And what was your normal day like? You were not doing physics at that point, let's take a full day when you had… ok maybe not a day but what was your normal week like? Take me through that.

Ja first year I would wake up around 5am because I was used to waking up at that time and take a shower and go for breakfast...

Alone at that point?

Ja, I was doing that alone. And then afterwards I would go to Marquad and eat there. I think our first period was maths, then Chemeng. So Maths I did enjoy, but when Chemeng came Ja, my day started being ruined (Laughs).

Ok lets continue with the day, just tell me about the full day first, then we come back to specifics. So it was maths, chemeng, then chemistry was 3rd?

Yes I think chemistry was third, and Ja that was it, 'cause I also did Communication but we didn't do it everyday. So Chemistry and Chemeng those are the courses that gave me a hard time in first year. Especially Chemeng, there you find that the lecturer just came in and he expects so much from you and says ok this stuff you have to be knowing already and he introduces new stuff. He talks about mastery tests and you have to know them. So that really puts a lot of pressure on you. So with Chemeng it was really hard. Especially when it came to Thursdays. Thursday was the day when we had Chemeng tuts so the first tut for Chemeng was yoh, ok you are in lectures the whole week until you get to a tut on Thursday, like you don't expect to get that kind of stuff in a tut. When you even got it yoh I just didn't realise that I actually had to finish it within the given time. So the lecturer just said that ok this is what you've learned already and he said you can solve this from what you know in matric. So that time I was sitting with my group members, it was 3 in each group, so it was me, Simba and Phato. So Ja but then Phato was repeating 1004 and Simba is quite good (laugh) and then

it was me. so then we came there and we worked. But then for them it was like, Simba was working alone, Phato was working alone, I was working alone. And then like within one hour, they were done, they understood the work and Simba was really good and here I was, I had not even finished one question and I don't see what is happening here.

And how did that make you feel at that stage?

Yoh! Ja I just felt like, Ja that day after that tut I felt like maybe I shouldn't have done chemeng. I mean these people are doing...cause I though with Kabelo he was doing it for the first time and Kale for the second time, but I thought ok we are all from school and we are supposed to experience the same thing but then for them it is so easy for them. They just cruised through that tut and they understood everything.

And how did you push through that time. I'm assuming that you did go further than just the first questions?

Oh Ja, the tutors were around but by then I was very uncomfortable because I was very shy to ask. So even though I struggled, I just sat there and then tried to understand and I was not seeing what was happening and Kabelo asked me 'are you ok?' and said 'yes its ok' because I felt like I don't understand this and he understands, so if I say in don't understand, I mean what will he think of me (laughs) so then Kale just left. And the lecturer kept saying no you have to finish before you leave. Ja so that was really pressure. So by that time I felt like crying because I didn't know what to do. But I tried to do it and tutors came and...

Did they come or you called them?

No they just came and checked and then I didn't say anything and they walked (laughs). I was just waiting for that time to say, I have to go now. Ja then like… I felt like…

So how far did you go with that first tut?

I only attempted the first question and I didn't know what was happening, but Ja, I guess I just kept on hiding; I didn't go through it properly. So like during the tut period, like didn't even finish one question.

And then later on that day?

Ja I went to my room and cried a lot (laughs) because I thought that I got myself into something that I won't cope with. So then I went to Vincent and asked him a few questions, like ok I don't understand this stuff; I didn't quite get it and for him for that first tut he sat and tried to explain the first 2 questions and said ok, like this other questions he said you can try them out and come to me. Don't be afraid to ask, and you can ask. So he explained to me the first 2 questions. From then I worked extra hard, put more hours into Chemeng.

Where in your day were you putting extra hours?

Immediately after lectures, the first thing I would do was Chemeng, maybe until after 10pm. So immediately after eating supper, I would go and study Chemeng until 10pm, sometimes even later. Then from there on I would do chemistry, but then maths was not much of a problem because Dr Smith...I understood in class, so I didn't put as much effort in it.

For you what made the chemistry, the chemeng and the maths lecturing so different? Ok lets first compare the chemeng and the chemistry because those were the two that you found most difficult...what did you find particularly difficult about the 2?

Ok with chemistry like they were using slides and in one lecture you get lots and lots of work. So chemistry it was more of... ok even the concepts, sometimes I found that it is not easy to just get it the first time; you have to read it over and over again and it was a lot of work to do in a day. Ja I think chemistry it was more of too much work.

And the lectures were using slides, yes, but in terms of language and in terms of how you understood the lecturers and the speed, do you remember much about that?

Ja in high school they used to... like even maths, they will here and there speak in English, but then they spoke in our own language and we got to understand them properly. But then here it is like, you even get white lecturer who speaks his own language and then sometimes you don't quite get what he is saying because he talks too quickly and I didn't quite get what he was saying sometimes. So that made it even harder. And then I had to sit closer to him, like in front. It was also a big class. So I think chemistry was more of like, lots of work and too many things to do. But then chemeng, it was not like we did too much things, but the concepts themselves were very difficult to get, especially with Professor Miles I felt like he expected us to know too many things.

Do you remember some of the things that he expected you guys to know that you didn't know at that stage that you felt like you were not prepared for?

Yes even. when we did unit conversions, he was so surprised that we struggled that much. Things that we were seeing for the first time, it was like...unit conversion, but the maths that we saw there, he expected us to use what we knew from high school that we had to know that stuff.

At that point, did you feel that high school did not prepare you enough for this?.

Ja I felt like... well for me I felt like ok maybe it is just me because I saw that everyone was doing well, they understood, so for me I just thought no it is just me; I chose the wrong thing. I was not supposed to do chemeng, so Ja it was lonely as well. For me I felt like what I was taught in high school didn't really help me, ok for maths it did help me, it made it easier for me to understand it.

What made it easier in maths? You had Dr Smith, who was also a white English-speaking lecturer. What made her class easier than the other ones? I mean she is still like a white woman speaking English...

But then with her she doesn't just move through stuff; with her she is more open. I didn't feel like I was afraid to ask her any questions. But then chemistry you find that it is male lecturers and it is hard to approach a person like that because he just lectures and he is serious all the time. And then he doesn't even laugh (laughs) so the thought of me approaching him, I felt like maybe he would think like...Ja I wasn't comfortable. But with Dr Smith, she was always open and she made jokes and she was more like...she reminded me my teachers...so for her she was easy to be approached. She also tried by all means to know all of us, like this is you and this is how you did...even when we did those weekly test, she would come and then say you did this and that, ok I see you struggled with this question etc., how can I help. So things like that, so it made it easier to approach her and ask her questions. She was like a teacher.

An then I working alone, do you remember some of the things in terms of being in the wrong course, like what kind of options you were thinking of etc.?

Ja I didn't think of...I just thought like ok I've already started and they are already paying a lot of money for my course, so I knew that after studying there is no going back, so I just

have to go through this. I didn't know how I was going to make it, but I just knew that somehow I just have to manage. Ja so thinking of other options such as leaving chemeng, I didn't think about that, but I just thought no I have to go through this, maybe I don't know how or maybe I'm gonna fail, but I just have to do it.

When did it start getting better? And what made it better, or rather at what point? Is it like or are there people you met who started to walk this difficult period with? Or was it...things at some point had to get better than when you got here?

Well (laugh), firstly the only difference between the first weeks of first year and all other weeks was that first weeks there was more stress of me not knowing places, like I didn't know the venue and I was overwhelmed by all these buildings, and the lectures and the style of lecturing and then different people. Ja so that was the most challenging part of the first weeks and also adapting, but I didn't think I quite adapted for the first year, but the first week was even more difficult because everything was so different. So first year I wouldn't really say that things got better. I mean everyday was just like (laughs)…

And then as you went through, tell me going through writing the first tests, maths, chemistry, and chemeng...your results for those, as in the experiences of getting those results…

For Maths it was like, even when we wrote the first test, I was not aware that it was the actual test because I mean Dr Smith was like, ok when I wrote that test, I didn't even know that we were writing a test. I didn't take it too seriously, it was just ok because I was coping well in maths. So then for that test I did do well, I got like 60 something; but chemeng I knew I struggled with that one. So for the first test I prepared very hard; I spent nights doing those stick methods , then I went to Vincent for more help and then questions papers...

And at this stage you are still doing things by yourself?

Yes I was doing it by myself. So I went to Vincent and then asked for help, Ja he did help there and there and Ja I always went back to him and asked more questions, so for chemeng I really did prepare for it.

So you passed the first test?

The first test I think I got like 51 or something. So that was the first test...

And how did you feel about that mark? Where you happy with it, were you not happy with it?

Yoh, by then I was very happy that I passed it (both laugh) because I knew that chemeng I was struggling a lot. So 50 for me was like wow you really have made it for chemeng. So I was happy about that 50, maths I was not that happy because I thought I did better.

And then chemistry?

Chemistry I don't quite remember what I got for it, I only remember maths and chemeng, cause chemeng I think I struggled more about that course. I am not sure what I got for chemistry.

And then in all this...at what point did you meet other guys, or start working with other people, or this didn't happen in first year?

Oh no it only started like 2nd year, that's when I started to work with other people like it only started in second year. So first year I knew Zweli, I knew Khotso and I knew Katlego, and I also knew Tshepiso. But Tshepiso was doing mainstream. But Khotso and Zweli were close because they stayed together all the time. So I just knew them like when I wanted to visit someone, I just visited them, but then like studying together we didn't study together. Because I mean when we had our first homework assignment I tried working with them, but it was like they were...they got the concept too quickly so for me its like I felt like I was pulling them back or something like that. And I also felt that when I was working with them, like you feel so discouraged because they just start quickly and get it and I didn't get things quickly, it took me time so it was putting more stress on me because working with them and seeing that no they are doing well and Ja it stressed me a lot, so when I worked alone I knew I was working in my own pace and I didn't have to compare myself with to those other guys.

Ok so but a few times you did try to work with them?

Ja I tried to work with them on the first homework assignment and then that was it. Like after that I felt really discourage because they got the stuff. Even that homework assignment I didn't believe that the lecturer expected us to submit it, because it was way different to what he taught us in class. Like high school you know that I get taught this and I will be asked same exact thing or something very similar, so I still had that thing that I had to get what I'm taught, it does not have to be twisted. But then that's what they do here (laughs). They twist

it. So for them they did it together. And then with Katlego, JA Katlego for me I found it difficult to work with him because we didn't agree with anything...

This is still in first year?

Yes still in first year. So then like even if he comes, we'd just talk about general things, we always argued so I mean after I go my way he'd go his way. We never really agreed on things.

Something academic you mean?

Ja even if it is not academic, like we just had like random arguments, like we just talk about something, say like all of us we'd talk about something, and then Katlego would start attacking and say no no no this and that.. so he was like that. So for me I didn't like that at all. So I didn't even consider studying with him at that stage.

So in terms of where you were staying, you stayed at College house and the other guys? Zweli and Khotso?

Zweli stayed in Kilindini, so he was just next door. And then Khotso stayed in Clarinus with Katlego, so they both stayed there.

So but then how did you...like when you guys were doing the first homework assignments, like where were you doing it?

Oh no I went to Kilindini because during that time I also knew Gift because Gift is from my hometown so I knew him quite well. Like immediately when I knew that ok he is from my own town we immediately bonded. So I visited him sometimes, he was in Kilindini and he also knew Zweli especially, Zweli and Tshepiso so when I got there then Zweli came and asked me 'did you do the homework assignment?' because I didn't think that we had to submit it. I thought we'd get lectures on that stuff then we'd submit it, so he was like no we have to submit this. I remember it was a Sunday. He said no we have to submit this tomorrow and Ja so, that's when I started to panic and tried to work with them.

So what would you say constrained you from changing to something else...is it because someone was putting money?.

Oh no, I just knew...I don't know by then I didn't think of anything else, I just thought, I started this so I mean I have to finish this; I have to go through it, at least try my best to do it, if it doesn't work out then I'll think of something. But then I didn't think of something because like I said, when I chose chemeng, or when I was in matric, I didn't really dream of say ok I want to be this or that, like even with engineering, I just thought ok I will do this because it has money and I did my elimination. So even choosing chemeng, is was not like I wanted to do it and by then I didn't think of any other thing so I just knew that ok I'll just do chemeng.

In the first interview you said something about the difficulty of accepting that you were in ASPECT initially and that only after two months that you accepted it, and you felt that well you did well in high school and all. What made you accept that it is ok to be in ASPECT?

Ja it was like this maths and all that was going on in ASPECT and also we had extra lectures to support us during the ASPECT workshops. So it quite helped; those extra classes for chemistry and chemeng. Also ASPECT was more like when you go to them, more for like Dr Smith knows you more personally and the ASPECT workshops it was like they knew us and they knew what we were struggling with; they told us what we must try. So chemistry lectures, it was not like ASPECT as they just moved quickly through stuff and they didn't come back to us or sit with us, so I just thought ok if it is like this then it is more of an advantage because people in mainstream do chemistry and they don't get extra lessons. And in maths they just do those maths tut, they don't have… we had weekly maths tests in ASPECT so that checked whether we are up to date all the time.

But now moving on to the rest of first semester, do you remember some of the things that happened during that semester. Did things get better?

In terms of lecturers and the their lecturing style I got used to it that ok this is going to be faster and we're always going to have PowerPoint and I'm going to have to accept the fact that i'm taught by a white person and that they talk faster and they don't talk my language and I'll have to understand it. So those are some of the things that changed. Also like being comfortable with being in Cape Town that i'm far away from home. I got used to it that I was in Cape Town and that my family was far away; I accepted that. Then with making friends and study groups or other people, that didn't change because, I also told you that when I studied with them or when I did that homework assignment I felt like they were too fast to

study with me so that didn't change for the rest of first year. I always studied by myself and always referred to Vincent and asked him when I had a problem and he would explain.

And then at the end of the first semester, you are writing tests and stuff and you were going home. Do you remember what was it like to go back home, and from home having to come back?

I couldn't wait to go back home; I couldn't wait for that. I think first year the day I actually left my room, I was so happy because I just wrote and afterwards I just packed and went home. I couldn't wait to go home.

Why?

Ja cause here everyday was torture; .everyday had its own struggle, like today you doing this stuff then doing tuts, you have to do this and that.

Oh by the way, I didn't really ask about that, before you tell me about the going home experience, how long, how different was your sleeping pattern from high school?

Ja in high school I used to work only during school hours and then afterwards, that was it. I would finish at 5 and that's it. I would cook, because I stayed with my grandmother; so cooked and did everything then afterwards I watched TV and then maybe play soccer and sleep. Tomorrow I go to school, during the day I do school work, afterwards I don't do any schoolwork. So here, it was like you worked during school hours and you going to work afterwards, like you have to put a lot extra work.

At what time did you go to bed, like how long was your sleep?

I slept around 12am and then wake up at 5am, so almost 5 hours.

Let's go back to wanting to go home. Leaving… the last day of tests and exams, you go home and how was it when you got back home?

It was such a relief because there I knew many people and I had everyone at home, so firstly I could speak my own language freely (laughs) and then I knew many people so there I felt more comfortable and I didn't have to work through homework and I didn't have to sleep late. It was back to normal life...

And your grandmother?

My grandmother I was also happy to see her again. She was also happy to see that at least you did make it through the first semester; I was very happy to see her. So it was nice; I didn't want that vacation to end (laughs).

But it had to end…

Ja it had to end. And I had to come back.

Talk me through some of the challenges that you particularly remember about the second semester.

Second semester we had things like projects in Chemeng so with the project you cant work alone; they assign you to a random group. So in that group I was with Michelle, Khama, Linda; it was the 4 of us. Working with them was like...you know I didn't work with other people, I was not comfortable and I was always working alone. So with the project you have to come together and agree on one thing and then for me it was more difficult because if someone says let's do this and the other one understands it in another way…it was hard for me to just because maybe my mind was… OK because I thought like this and then, I didn't know how to negotiate ideas. I just wanted people to understand things the way I understood it because it was easier for me and also what made it more difficult was because you are faced with a problem now and you all have to come with the solution now, of you are going to approach it. So for me it took time to quite get what was happening. So obviously I had to contribute, I didn't know what was happening and not sure, and that made it too difficult. I had to think quickly which was something that I couldn't do. So with them they got it and for me it was quite difficult. I mean I had to participate, I couldn't just sit there, so after those meetings I felt very depressed and became very demotivated because I thought what are they going to think of me? And with the project you have to assess each other and give each other the mark, so I also thought of those things. Ja so I think that was the most difficult for me, the first year project in the second semester. Ja for maths first year, it was just ok I didn't struggle with maths, and chemistry second semester I think I got used to the lectures. In the second semester I was more struggling with it especially when we were doing VLEs. So it was quite hard to get what the lecturer was trying to say.

But how did you get it, what did you do to end up understanding the stuff you were not getting?

Like I said, after supper I'd work through it. And then if Vincent was available I went to him, and asked him to explain, then sometimes he would was 'ok what have you done?'. So sometimes he would ask what have you done and as time went by, at first he'd do the things for me but later on he didn't do that anymore, he just said ok, Ja try to do it and then i'll just see your thinking and try to help you through it.

Where there other people you were consulting with at that time? Or was it exclusively Vincent?

Ja it was just him, because I knew him that year, cause I met him once so I was more comfortable with him.

And the tutors? The lecturers? Approaching those?

I never even thought of asking them. I just worked there alone. Ja Dr Smith in class I would ask because I was more comfortable with her. So for maths Dr Smith is the only person I asked.

And the passing away of your grandmother, did it happen in first year or second year?

It happened in first year in the second semester.

At what point in the second semester?

I think it was just before the September holidays. It was during this time when she passed away because I remember that I went back home and then I didn't miss any school work and I came back.

And how did you pick yourself up from that?

Oh from there like... I think ok for me when I heard about her passing I was with Zweli because I went to see Gift and then I didn't find him and I saw Zweli and then I talked to him and hang around with him to find out how things are. I think we ended up listening to music, so I just got a call. At home they knew at that I always used to call my grandmother on

Sunday evening and asked how she was doing. So they called me and I think she passed away around 4pm. So before I called, my aunt called me and told me that my grandmother told them not to tell me anything, but she had ben sick, she was really sick. So she knew that I was too attached to her so she didn't...whenever I called she pretended to be ok. But then her sister, my grandmother's sister, she came by and they were all there together, but I didn't know what was happening at home but she told them not to tell me anything because she said it was going to distract me. So they told me that ok she told us not to tell you, but just to let you know that she passed away now. Ja at that moment a part of me I felt ok because when she was sick at some other time in 2007, I knew how she struggled most of the time. So a part of me was like ok at least she is now released of that pain. But also I was satisfied that in 2007 I at least got to spend time with her I had been there for her so I didn't feel guilty that ok I was not there for her. So I just felt like ok at least I was there last year and spent the whole year with her, bonded with her and she was happy and then I was just happy that at least I was there for her. But another part of me was having a crisis. She was the only person I was very close to. But I only had to think about the pain she went through and I just thought ok no, she was old so I mean it has to happen at one point that she has to pass away. So Ja that didn't affect me that much. Maybe most of it was because I was satisfied that I did spend some time with her and that she knew that I loved her.

And she also wanted you to go to school and do something for yourself...

Ja so, luckily I guess because it was during the vac so I went home and when I got home that's when I cried and did everything so I accepted that ok she has passed away. And then when I came back I knew that...ok the only sad part was like...she was the one I talked to most of the time. I was very close to her. But then academics it didn't affect me that much because I think if it maybe happened during the term, maybe it would have had an effect. And then when I came back I was ok. That's where I also started to put more effort, like working very hard because Chemeng, I had failed some homework assignments and my average was low. I think it was like 40something, but then close to 39. So I just knew that this time I have to really work.

Did her passing motivate you to do more?

Ja it did because then I just had to focus, I just thought ok now she is no longer there and that I was on my own. That's what I thought. So I just worked very very hard, even in maths, I

didn't put much effort in it, but after coming back from her funeral I just kept on working more on it. I didn't sleep at 12 anymore; I slept like maybe 1:30 a.m. I started to really work. Ja for Chemeng, Vincent was also working on his exams so I didn't quite go to him that often after that. So I just kept on working and using my past papers and past materials. That's how it was, I just worked. I didn't think of anything else.

And then towards the end now, in preparation for your exams. What got you through that?

Oh Ja I remember that, we'd just had a project, so we started our exams on a Wednesday. But then the project had ended on the previous Friday so it was like that because I remember that I didn't have time. We'd just worked on the project most o the time. Ja working on the project meant that we shared the work so during the day, whenever there was a gap I'd like to the library and do research on our project; I tried to contribute in our group and do my part so that took most of my time. I also had to keep up with maths, so I wouldn't let the day go by without doing some maths and chemistry.

But I mean in terms of the actual exams and psyching yourself for them?

I didn't have much time to quite prepare for them but I had that Saturday and Sunday, Monday and Tuesday so it was immediately after the project. I mean for the project sometimes we met late nights so after that I just left. So it was hard to work, especially tried to work on chemeng.

Did you by any time feel like your journey at UCT could end at the end of that year?

(laughs) No. I think for me what I've seen is that there is a difference between knowing that you can get excluded and seeing that ok it actually happens. I knew that people can get excluded but while I knew that this can happen, it didn't register in my mind that it can actually happen, because I'd never seen a person who got excluded at that point. So I just thought ok, oh exclusion, so I just knew exclusion is there and that's it. I didn't even think about the possibility that I could get excluded. I just knew that it was there, but it was something that was not real. So (laughs) I'd never seen it. Ja it only becomes clear when you see that person that you knew got excluded, that's when you know that ok Zweli had called me and told me that he got excluded; that's when I saw that this does happen. I got exactly

50 for Chemeng, so I guess this was very very close to exclusion. That when I got really scared that this was very close. Ja but then before that I didn't really think of exclusion.

And going into second year...was it different? How was it different from first year?

Well second year...like when I left home in January...I knew where I was going, I knew where College house is and I already knew places so it felt much better because you know what is going to happen and what to expect. So that makes a huge difference. Ja so second year, I think what changed is...that's when I really tried to study with other people, especially when we did CHE2031…

Example of the initial process of coding and abduction using interview data

Summary of Ogone's interviews (the first 10 pages of the summary)

Family background

……. [Potential constraint] ……. [Potential enablement] ……[Noteworthy]

Ogone is from Phokeng, near Rustenburg. He is the second child of three children of his mother. He never really knew his father (I didn't think it was necessary to pursue this) and he and his brother were raised by his grandmother. He stayed with his grandmother from when he was in grade 3 onwards, until he left for university. His mother lives with his stepfather and his younger sister. He depended on his brother and grandmother for financial support. His mother lives in another area, which is about 45 minutes from Phokeng, and she only comes to visit them once every 2 weeks or so.

Ogone spent much time with his grandmother; he took care of her in the last few years of her life. When he was in school, he used to come back home and clean and cook for her. He seems to have loved her and listened to her (far more than to his mother to whom he does not seem to be as close). His brother is working and, because he mainly worked night shifts and came home tired, he was usually asleep, so it was up to him to do the cleaning and to take care of his granny.

Ja, because my brother was like working night shifts so even during the day when he comes he sleeps, so I was taking care of her as well. Also that year, at the beginning of that year, I was also influenced by that, like if I stay here, it will be better for her. [3]

It later became clear that it was because this sense of responsibility towards his grandmother that he did not apply to university in 2007.

So then Ja, it is just that like... because I also saw at that time that she was really sick so, but she needed someone to be there, so that's why maybe I actually decided to stay at home. [4]

His grandmother later passed away when he was in first year at UCT.

His community, friendships

He did not engage much with the happenings of his community, partly because he did not want to engage with people who were always drinking and getting into mischief. He preferred to stay at home and with the responsibility he had, he felt that this was the right thing to do. He did not have many friends because he grew apart from his childhood friends.

But he made friends with a guy from Mozambique who lived in his community. He said he could relate better to this friend:

I guess he was more mature, and he was different from those other guys, and also, maybe I felt sorry for him because of his experiences, he didn't have both parents and he came here because Mozambique was bad. His mom died and so did his dad and sister. So step-parents raised him and they didn't treat him like their own. [13]

At that time I knew I was shy, very shy, so I also know his experience and I know it was not nice. So I used to put myself in his position, like I know that I'm like this. And for him it was difficult being in a different environment and having to learn different languages. So I knew how hard it is to get used to know people, so I didn't want him to feel the same. [13]

Contextual continuities/discontinuities and deciding to go to a different school from his community

Ogone chose to move out of his immediate community to go to a 'better' high school, firstly because he perceived his local high school as not having good mathematics and science teachers.

The thing is like there...the thing that demotivated me was like, most of the students who went to that high school were smoking and doing all those bad stuff and I thought if I go there... I don't want to go to that school. So then they don't have... teachers there. So they are also struggling. They didn't have teachers who knew their work. But then where I went to, it was a good school. Teachers there were good and they really cared about students there, Ja and they are strict, even corporal punishment it's still used there. [7-8]

Secondly, his friends from middle school were going to other schools in town. He did not want to be 'stuck' at Phokeng: he needed a new environment. His brother supported him in his decisions and he was the one who would have to buy him a bus ticket to the new school. Torn between his mother and his grandmother, he cried when his mother insisted he went to a local school, but he did not listen to her. He said he had to convince his grandmother, whose opinion mattered to him more than that of his mother. He cried to show how strongly he felt about leaving the area for another school.

His high school – new area

The new school had better teachers and resources and he felt that the school really was supportive of them; it was a strict school. He said, even today, corporal punishment was still used at this school.

He said adjusting to the new school was very difficult though:

When I made that decision to go to school in another area, I didn't think about the fact that I don't know anyone there... Ja, it didn't like...like the first day was really horrible, I didn't know the place I didn't have friends, yoh it was hard. That day, I even tried to call home and was then thinking of going back to a local school. [9]

It was new people, a new environment, and he had no friends. For the first 2 weeks, the only friend he had was his desk mate. He later became friends with 2 other students, but this relationship started because of their academic strengths: he was good at physics and they were both good at mathematics. So he would go to them to ask for help in mathematics and

they'd do the same with physics. Later on, they started to spend much time working together, until the relationship also became a friendship. But these two friends of his were also not from the area of the new school; they too travelled to school.

He remembers how, on the first day, he felt so scared that he decided to call his brother and tell him that he wanted to go back to the school in his community. His brother told him he could not do that. He also felt that he had to stick it out at the new school because his brother and grandmother had already spent so much money buying him a bus ticket and new uniform. In addition to this, he had cried to his mother and grandmother about going to this new school, so he could not turn back now.

The thought of going back to his local school was met by yet another constraint.

Because if I decided to stop going there, they had already paid for my ticket and everything and for my new uniform. And that I also cried and told them that I wanted to go there, so now I couldn't go back. And then I called my brother and he said hang on, you can't do that, you said that you want to go there, so just go there.

It was interesting that Ogone did not apply for any funding to pursue any studies after matric. He says he did not really think much beyond grade 12; his focus was just on working hard to complete it.

Ja, like I didn't think much about what I was gonna do, I was just focusing on finishing matric, so I guess I was narrow-minded, I just thought about what I did then and I didn't think about what I was going to do. I mean they talked about application forms and everything, but I didn't take it up and they also gave us applications forms but I only looked at it once and didn't fill any in. Ja, it is only that year after I'd finished, that I thought about things. [1]

But he also blamed his lack of activity towards pursuing his studies to the fact that his two friends had not applied anywhere either (they did quite a lot together; they even attended Saturday classes together). But later on, his friends did apply, one to Wits and the other to UJ, but because the applications were late, they had to self-apply and that was not something that he was prepared to do, because he was too shy to have done that.

Oh, for me I guess it's like self-application, you have to go there and you have to say... so I think by then I was shy you know, so the thought of going there and doing self-application... Ja to Ja to Wits or something else. I didn't feel comfortable, like these other people, so I just decided to stay. [3]

He was also approached by a guy who was a lecturer at UP, who informed him of the bursary opportunity that was available for that very same year at UP, but he declined it, attributing this to his dislike of drawing:

Oh no. Ja, drawing like I really hated drawing, so it was out. But then it was like I decided I'll stay for 2007. [3]

His dream and what/who influenced it

For me, I didn't have anything that I wanted to do, I was just attending for the sake of attending because that's what people did; they used to be primary school and middle school etc. I mean I did know what I wanted to become, even engineering, I didn't know about engineering, commerce, psychology and all that, I only got to know about them in grade 12, that's when I started to know that, OK, there is engineering etc. [10]

So in the new year, 2007, he found himself at home. He said the other reason for him not really looking ahead for his studies was that his grandmother was sick and if he left home, who was going to take care of her? So he remained at home, but it was a bit difficult for him, especially because his friends used to call him and tell him all about the universities they were attending.

His grandmother then encouraged him to leave home to go to school. For him, this was a difficult thing to do, as it would mean that he had to leave his grandmother.

Ja she always encouraged me that I really have to go, she will always say, no you don't really have to stay just to take care of her, you can also apply. So she would encourage me, she said Ja next year, you really have to go back to school. [4]

But he says that she insisted and, upon getting his grandmother's blessing for this, he started to apply to many companies for bursaries to study chemical engineering. Her blessings reduced the feelings of guilt that he felt about leaving her:

I think, especially her, when she said yes you can go, I wouldn't feel guilty like, OK, I apply and I left her there. [5]

He decided to study engineering because he heard while in high school that it was for people who were good in mathematics and science, and that you also get paid well as an engineer.

So then in 2007, I stayed for a year and that's when I sat and thought of engineering, like I don't know why engineering but Ja, I think it was more based on money, because people used to say that when you do engineering you gonna earn lots of money. [p. 1]

He then went through a process of elimination to decide which discipline to choose. Firstly, he decided not to choose civil engineering, because it involved so much drawings (he was doing drawing at school and he knew he did not like it). Then he did not like electrical engineering because he did not really like physics, especially the electricity part of physics, so he could not do electrical engineering if it meant he had to deal with electricity. But he remembered that he enjoyed chemistry and that chemical engineering involved some of it. So he went for that. By the time he applied for funding from various companies, he was applying for chemical engineering.

Making a move: applying to UCT chemical engineering - getting in - through ASPECT

Ogone needed a break from his Rustenburg home. He applied to UCT partly because he liked the idea of being in Cape Town, but in addition to this, he found UCT's application fee of just R90 more affordable than most institutions. He applied to Wits because he had a friend there, and his friend brought him the application form. The application fee at Wits was R250. Although he would have liked to apply to other institutions, he did not want to ask for more money from home.

And then UP, I also wanted to apply but I was also limited because they have application fees and everything, and UCT was by then like R90, which was the lowest. And then Wits was R250, so those two, because I had that money, I only applied to them. I didn't want to ask for more money and apply to many other universities. [5]

UCT gave him a firm offer and later on offered him accommodation at College House.

Wits eventually accepted him for a 4-year programme a week before they reopened. Although Wits was much closer to home than UCT, he was not given accommodation and he needed to pay a R5,000 registration fee. He felt that this was too much for him to ask of his brother and his grandmother.

He also knew that if he chose Wits, then he would have to ask for money for accommodation and to buy food. So UCT became the best choice financially, because he did not have to worry about those costs (even though it meant that he would be too far from his grandmother).

I think I would have decided to go to Wits, but the thing is they needed R,5000 so like for me I didn't want to ask for that much money from them and at that time I didn't have res, so it means I would also have to ask for money for a flat and to buy stuff to cook and everything like groceries and I just thought of them and said no. [6]

In addition to this, he had applied and secured a bursary from the Royal Bafokeng, which offers money to students in that area who want to study further. This funding was already tied to him studying at UCT.

During December 2007, his friend who had gone for training at Anglo also informed him that he had met someone who studied chemeng at UCT. So his friend set him up with the guy (I will call this guy Vinny). So Vinny told him that chemeng at UCT involved a significant amount of work, but it was really nice there. Ogone did not believe the part about how hard chemeng was, because he knew that his grade 12 results were good; he was fooled by these good marks.

So I met with him and he told me like, Ja it's not easy UCT, especially chemeng. But then at that time I thought I just did matric and I did well and did not struggle to grasp concepts, so it was like I didn't believe him. [6]

Vinny took it upon himself to use his money and booked a flight for him to come get to UCT. Vinny was doing his vac work at that time. He also informed him that he was also staying at College House and that should Ogone decide to come to UCT, he would help him out. Their agreement was that Ogone would refund him for his flight booking once he was at UCT.

Getting to UCT - getting in - arriving in Cape Town, adjustment and ASPECT

He remembers the day when he left home for Cape Town; it was going to be his first time at OR Tambo airport, his first time on a plane, and his first time in Cape Town! It was scary for him. His brother took him to the airport and after he'd gone through the security checkpoint, he realised that there was no turning back (although at that time turning back was going to be much easier than going forward). He had to find his gate and he did not want to ask anyone where his gate was because, until then, he did not engage much in English conversations. He was afraid of leaving home:

Like I was afraid of leaving, then I felt I had to do this one, because I had the experience of staying home for that year and I just thought no. Ja, I knew that I had to go now, I didn't think of going back. [11]

He enjoyed the flight; he had a window seat so he was able to enjoy the view, which he'd only seen in maps. When he landed in Cape Town, while waiting for his bag, he saw someone take his bag and put it next to himself. He was really thinking that this stranger was going to steal his bag. He approached the stranger and informed him that 'Hey, this is my bag' and the stranger replied 'Yes, I know'. That freaked him out a bit. So the stranger said, 'You are going to UCT right?' He replied 'Yes'. The stranger said, 'Well, so am I'. So they left together to go outside to find a metre taxi. Just before then, they met another lady who was also going to UCT (but not new). She informed them that the metre taxis were expensive and that she was waiting for her transport there, so they could ride with her. The ride came and the 4 of them got to UCT. Coincidentally, the driver of the car was also staying at College House; so he helped him to sign in, get to his room and to settle in.

He says that the first 2 weeks in Cape Town were the most difficult. He was not comfortable talking to strangers and he found it very difficult to make friends. The fact that he had to go eat at Leo Marquard Residence also made it difficult for him, because he got lost. When he came to ASPECT, he met other people, but it was still difficult because he was very reserved.

Yoh, Ja the first 2 weeks were the hardest. It was the first time I left home, the first time I'll be like all on my own, didn't see anyone at home, I had to speak to people I didn't know. I was not comfortable, also speaking in English; it was not something I was comfortable with. For me it was hard. I had to... even to find friends because I couldn't like just rely on Vinny all

the time, because he was in second year and he had things to do. First week was hard, staying in College House, you had to go to Marquard for food, from college to Marquard for me was like a mission because it was a new place, because I didn't know my way back. I came to campus and it was these huge buildings and you had to find the lecture theatres and it was really challenging. [12]

He says he was really scared to find the ASPECT place. He was helped by another student to find it. ASPECT made them play games that led to him meeting other Sotho/Tswana speakers, but then it was difficult to continue to meet them because of the following reasons:

Yes, all in the first meeting... yes because they made us play this other game and because Zweli was interactive, so he wanted to meet new people and he wanted to meet me and after he met me, he said oh there's also this guy from North West and introduced etc. Ja so that first meeting that meeting was really... But then on the second day Zweli was not there and then these other guys, you tried to talk to them, but then they still want to go somewhere, so it was like you are left alone again, and I guess it was hard because you stay in different reses also. I also had to go to a chemistry lecture and it was way different because they were going fast and then they used slides and yoh it was different. [12]

He mentions that he was really not happy with being given ASPECT because he felt that he was strong enough to do the degree in 4 years. He struggled with this 'being in ASPECT' issue and only accepted later.

At first, when I received the letter, I didn't quite like the idea that I'm going to do it in 5 years. But then... like even going to that ASPECT meeting, I didn't feel like I had to go to ASPECT. I felt like I could do this in shorter. I think it is only later that I got to terms with the fact that I was in ASPECT and that I had to accept it, but at first, I didn't like the idea. [13]

His initial discontent with being in ASPECT was because:

I felt that if I go to ASPECT then it means, we cannot do it like other people do it, I know like I can do it in 4 years. I didn't know why they chose to put me in 5 years. I didn't know what was going on. I think I felt that if I had an option, I would have gone to mainstream. Ja, that's what I felt for the first 2 months, and it was only after that, when I accepted that I was in ASPECT. [13]

Reasons why he accepted it?

So and also ASPECT was more like when you go to them, more for like Dr Smith knows you more personally and the ASPECT workshops it was like they knew us and they knew what we were struggling with this and told us that we must try to do this etc. So chemistry lectures, it was not like ASPECT thing, so they just moved quickly through stuff and they didn't come back to us or like sit with us, so I just thought OK, if it is like this, then it is more of an advantage because people in mainstream, they do chemistry and they don't get extra lessons. And in mathematics, they just do those mathematics tutorial, they don't have like, we had weekly mathematics tests in ASPECT, so that checked whether we are up to date all the time. [21]

Ogone's concerns in general

Happiness and money

At first I just came for the love of money, but now Ja money is no longer my focus. [14]

Because like, you know when you are in high school, you think that if you have all the money, then you'll be happy and all that stuff. I mean, when you are at varsity, you get to see that Ja, money is not really something that would make you happy. There are many things that are involved. So Ja, it changes over time and you start to see that no actually, it doesn't really make you happy. So, I mean now Ja, I'm just doing it... I actually love chemeng, l love it now. [14]

His ultimate concern

Laughs...well I think. Jo...what will make me happy is not...like I said now; I don't see that money will make me happy. Like all I see now is that I'm only happy when I'm with my family. Especially when I go home, the first thing that I do is I go to my sister, because now I stay alone. I stayed with my grandmother and my brother. But he's bought a house and he moved. So when I go back home, I stay alone. So what I do is. I go to my sister and take her kid and then go to my aunt and take her kid and then we all go home and I spend time with them...that's when I feel most happy. That's what I like the most. So it keep me going because for me, I never had an uncle so I mean to them, I'm their uncle so Ja, all I'm doing... I'm doing this for them and if I can see them being happy and not having to go through financial

problems like I did last year, and it will be good. So all I think and do now is for them, and that would make me happy. [36]

He felt a particular bond with his aunt's child, because he shared the same upbringing by his stepfather and he did not want the child to go through what he went through. About his sister, he said:

With her, she is married, it's like she is married to the father. So with him, I don't worry that much, but also with my sister, she has also done a lot for me, so if I do this, I cannot pay them back with my brother, but taking care of their kids will go a long way. [37]

His current project

Oh no, I have to get this degree because I've gone through hell (we both laugh). So I can't just go through hell and leave it. [14]

The pursuit of a project – constraints and enablements

First year

Institutional constraints:

Difficulty adjusting to the institutional culture and ways of doing this (like use of technology in teaching, pace, language etc.)

Like I said, I was not comfortable with speaking with other people. I felt more comfortable when I spoke in my own language with other people, I was used to it. Here it was different and the other thing is that I was far away from home and I was also shy, like really shy. so it was hard for me to make friends and get to know other people...

So for me to like... I think the first week of lectures or so, chemistry... you are not used to PowerPoint slides and everything. so when you get to chemistry lecture they use PowerPoint and in matric you were like I know chemistry, but when you get here you realise that you actually don't know anything. They cover new stuff and Ja, it is quite challenging to adapt to that.

Ja like, in high school they used to... like even mathematics, they will here and there speak in English, but then they spoke in our own language and we get to understand them properly. But then here it is like, you even get a white lecturer, who speaks his own language and then sometimes you don't quite get what he is saying because he talks too quickly and I didn't quite get what he was saying sometimes. So that made it even harder [17] (issues of race, language, and pace coming up)

I couldn't wait to go back home. I couldn't wait for that. I think first year, the day I actually left my room, I was so happy, because I just wrote [my exam] and afterwards, I just packed and went home. I couldn't wait to go home. Ja because here, every day was torture. Like you have to have like... every day had its own struggle, like today you doing this stuff then doing tutorials, you have to do this and that...[21] [just difficulty adapting]

Faculty constraints:

The consequences of the loaded EBE curriculum:

So Ja, yoh, it was challenging. And the other part is that you are attending lectures from morning until afternoon, so then afterwards you go back and you are tired and you have to study. So by the time you have to study, you are really exhausted. [15]

Departmental constraints/enablements

Here he talked about how he did not think of leaving chemeng, even though things were difficult for him.

Ja I didn't think of... I just thought like OK, I've already started and they are already paying a lot of money for my course, so I knew that after studying there is no going back, so I just have to go through this. I didn't know how I was going to make it, but I just knew that somehow I just have to manage. Ja, so thinking of other options, such as leaving chemeng, I didn't think about that, but I just thought no, I have to go through this, maybe I don't know how or maybe I'm gonna fail, but I just have to do it. [18]

Oh no, I just knew... I don't know. By then I didn't think of anything else, I just thought, I started this, so I mean I have to finish this, I have to go through it, at least try my best to do it, if it doesn't work out then. I'll think of something, but then I didn't think of something

because, like I said, when I chose chemeng, or when I was in matric, I didn't really dream of saying, OK, I want to be this or that. Like even with engineering, I just thought OK, I will do this because it has money and I did my elimination. So Ja even choosing chemeng, it's not like I wanted to do it and by then, I didn't think of any other thing, so I just knew that OK, I'll just do chemeng. [20]

Course level constraints

Ogone talked about how mathematics was more manageable due to being in ASPECT and being taught by a good lecturer:

So that was a whole difficult part of it, adapting to the lectures and coping with the work was... OK for mathematics was ok because it was ASPECT, Dr Smith was quite good, she was more like a teacher than a lecturer. So with her, I felt more comfortable. I was coping with mathematics. [15]

Although Dr Smith was also white and English speaking, he found her more approachable than the white male lecturers in chemistry who looked 'serious' all the time. [18] He found her to be more relaxed, as she made jokes in class to make them relax; she was approachable, she tried to learn all their names and she gave feedback after assessment and tried to help wherever she could.

Chemistry

He found the use of PowerPoint quite a challenge in chemistry. He also found that the course content was much harder than what he was used to. What made this even harder for him was the fact that he studied alone, because he did not have anyone to study with. The whole shyness issue really affected him in forming working relationships with other students:

So Ja, chemistry, it was more of... OK even the concepts, sometimes I found that it is not easy to just get it the first time, like you have to read it over and over again and it was a lot of work to do in a day. Ja, I think chemistry, it was more of too much work. [17]

Ja that's because for me it was difficult, like I was shy, very very shy to talk to other people and to actually study with them. I thought OK if don't understand this, and if he understands

it, how will he look at me? Like this guy doesn't know anything and all that stuff, and Ja, I just thought like that, so that's why I found myself working alone in first year. [15]

Chemical engineering 1

I think our first period was mathematics, then CHE1004, so mathematics was like I did enjoy that one. Chemeng, when chemeng came, Ja, my day started being ruined. (Laughs). [15]

He says what made chemical engineering particularly difficult was the fact that the lecturer expected them to know things that he did not know and that he had not seen before. The Thursday afternoon tutorials were even harder for him, more so the first afternoon. He and others were expected to use their knowledge from high school, together with what they had learned that week to solve problems that he thought he was not expected to complete by the end of the afternoon. He remembers sitting in a group with other students who were supposed to be assisting each other, but they were working individually. He remembers how they finished the tutorial within an hour and how he stood there, not knowing what to do.

Yoh! Ja I just felt like, Ja that day after that tutorial I felt like maybe I shouldn't have done chemeng. I mean these people are doing... because I thought with Kabelo he was doing it for the first time and Pheladi for the second time, but I thought OK, we are all from school and we are supposed to experience the same thing but then for them, it is so easy for them. They just cruised through that tutorial and they understood everything.

Tutors did come around to check what he was doing, but he was very shy to ask them for help. One of his group members asked whether he understood. But he was too afraid of what the other student would think of him, if he was honest about his situation.

I just sat there and then tried to understand and I was not seeing what was happening and Ja, Kabelo asked me 'are you OK' and said 'Ja it's OK', because I felt like I don't understand this and he understands, so if I say in don't understand, I mean what will he think of me (laughs)... [The lecturer] kept saying no, you have to finish before you leave. Ja, so that was really pressure. So by that time I felt like crying because I didn't know what to do. [16]

The tutor came past; he just didn't find it in himself to ask her for help. He just waited for the time to be over so that he could leave. He says he only attempted the first question of the

tutorial, and he did not even finish it. Later that day, he went back to his room and cried, but afterwards he approached Vinny for help.

Ja, I went to my room, cried a lot (laughs), because I thought like, yoh, I got myself into something that I won't cope with. So then I went to Vinny and asked him a few questions, like OK, I don't understand this stuff, I didn't quite get it and for him for that first tutorial, he sat and tried to explain the first 2 questions and said OK, like this other questions, he said you can try them out and come to me. [16]

In terms of whether he felt high school did not prepare him enough at that stage, he actually felt like maybe he was the one who had chosen a wrong career.

Ja I felt like... well for me, I felt like OK, maybe it is just me because I saw that everyone was doing well, they understood, so for me I just thought no it is just me, I chose the wrong thing. I was not supposed to do chemeng, so Ja, it was lonely as well. Ja, like for me, I felt like what I was taught in high school didn't really help me; OK, for mathematics it did help me, it made it easier for me to understand it. [17]

And how he did in the first tests?

The first test I think I got like 51 [for chemeg1] or something. So that was the first test... Jo, by then I was very happy that I passed it (both laugh) because I knew that chemeng I was struggling a lot. So 50 for me was like wow, you really have made it for chemeng. So I was happy about that 50, mathematics I was not that happy because I thought I did better. [19]

In the second semester, he was once again taken out of his comfort zone when he was asked to work in a group in chemeng 1.

Second semester, the thing is like for 1004, we had things like projects so projects, you can't work alone on a project. So they assign you to a random group. So in that group I was with Michelle, Khama, Linda, Ja so it was the 4 of us. Jo, like working with them was like...you know I didn't work with other people, I was not comfortable and I was always working alone. So with the project you have to come together and agree on one thing and then for me it was more difficult because if someone says let's do this and the other one understands it in another way, yoh it was hard for me to just... Because maybe mind was like OK, because I thought like this and then, I didn't know/unable to negotiate ideas. I just wanted people to

understand things the way I understood it, because it was easier for me and also what made it more difficult was because you are faced with a problem now and you all have to come with the solution now, how are you going to approach it. So for me it took time to quite get what was happening. So obviously I had to contribute, I didn't know what was happening and not sure, and yoh that made it too difficult. I had to think quickly which was something that I can't help. So with them they got it and yoh it was quite difficult. I mean I have to participate; I can't just sit there, so after those meetings I felt very depressed and you become very demotivated. Because you think, what are they going to think of me, because with the project you have to assess each other and give each other the mark, so I also thought of those things, Ja so I think that was the most difficult for me, the first year project in the second semester. [22]

Other

First year for him did not get easier:

> *Well (laugh), firstly the only difference between first week of first year and all other weeks was that first week there was more stress of me not knowing places, like I didn't know the venue and I was overwhelmed by all these buildings, and the lectures and the style of lecturing and then different people and then. Ja, so that was the most challenging part of the first weeks and also adapting, but I didn't think I quite adapted for the first year, but the first week was even more difficult because everything was so…*

Appendix 3:ASPECT curricula

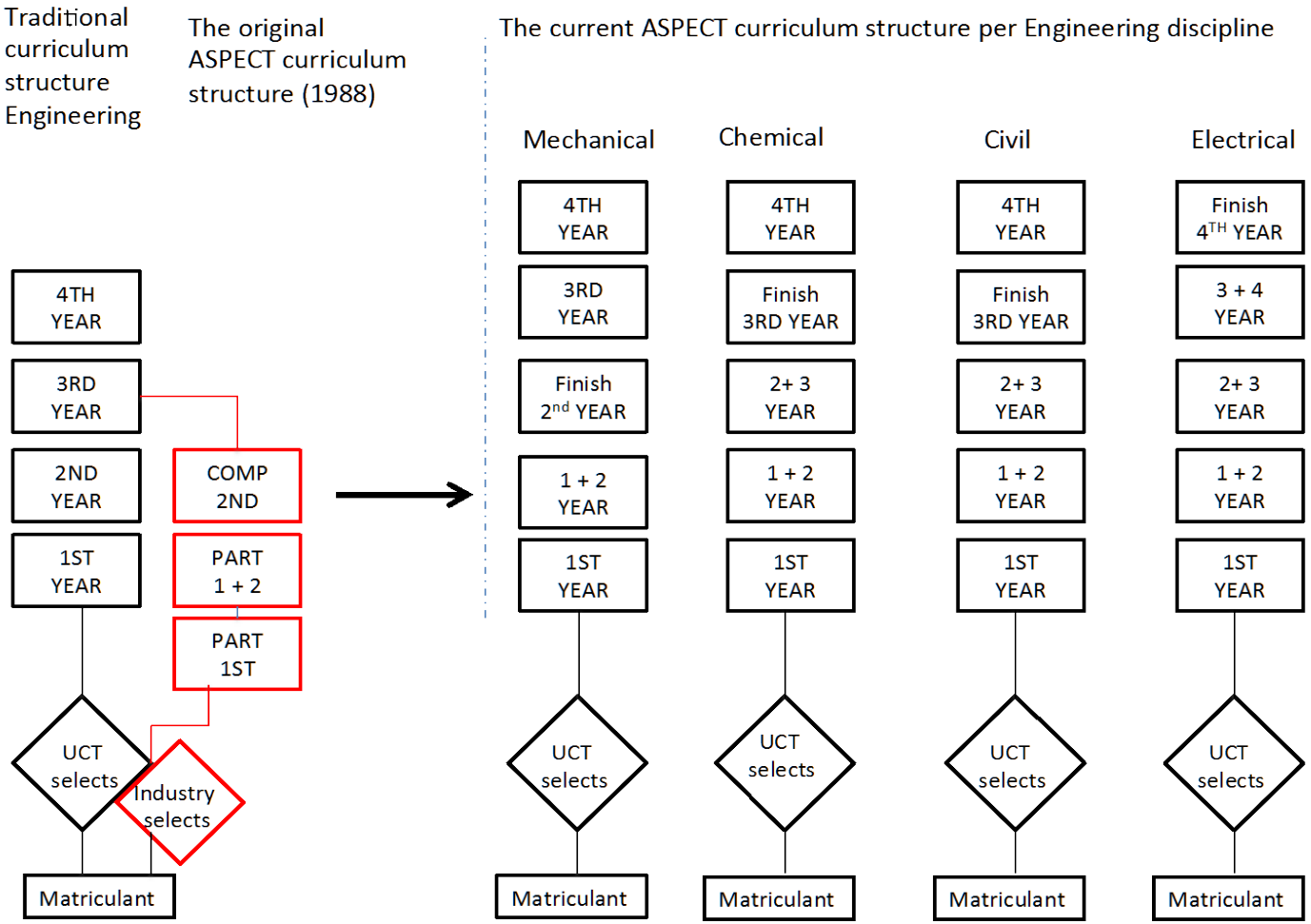

Figure B1 the original ASPECT curriculum model compared with the actual departmental models

First year							
Courses	Maths 1	ChemEng1	Chemistry1	Comm1			
Credits	32	32	36	8			
prerequisites							
Second year							
Courses	Maths2	ChemMaterials(F)	CHE2032F	Chemfluids (240)	ChemPrac1	Physics 1	
Credits	32	20	8	20	4	32	
prerequisites	Maths 1	ChemEng1, Chemistry 1, Maths1	co-rec Chematerials	ChemEng1, Maths1, Physics1, DP in ChemMaterials	Co-ChemMaterial		
Third year							
Courses	Chemistry 2A	Chemistry 2B	ChemThermo1(S)	MassTransfer(F)	Solids (S)	Maths 3	Drawing 1
Credits	24	24	12	16	12	12	16
Prerequisites	Chemistry1, Maths1, Physics1	Chemistry 1, Physics1, Maths 1	ChemMaterials	ChemMaterials, Chemfluids, Maths2	Chemmaterial, Chemfluids	40% in Maths 2	
Fourth year							
Courses	ChemThermo2(F)	ChemReactor1(F)	ChemReactor2(S)	ChemSeparation(S)	ChemPrac2(W)	PCU1 (S)	
Credits	12	12	16	16	16	12	
Prerequisites	ChemMaterials(F), DP in Chemthermos1	ChemMaterials, Chemistry 2A, DP in Chemthermo1	Chemfluids, DP in Chemreactor1, Chemthermo1 and Mass Transfer	ChemMaterials, Chemthermo2, DP in Mass Transfer	All 2nd year core courses	ChemPrac2 as co	

Figure B2 Guideline of the first 4 years of the chemical engineering curriculum for ASPECT students

First year							
Courses	Maths 1	CivEng1	Physiscs 1	Comm1			
Credits	32	32	32	8			
prerequisites							
Second year	CEM1008F	Mam1042S	Mec1002W	Geo1008F	Mam2080W	Civ2034S	Civ2040/38S
Courses	Chemistry 1B	EngStatics	Drawing 1	GeoforEng	Maths2	Spacial data	CivFluidMech
Credits	16	16	16	12	32	16	16
prerequisites					END1007W	DP (END1007)	END1007W, PHY1011W
Third year	Civ2011F	Civ2031S	Civ2037F	Civ2089S/Civ3034S	Civ2036/3046F	Mec2042F	
Courses	Mech of Material	Structural Eng1	Exp Methods	Geotech1	FundWatertreatment	MatScience	
Credits	16	16	16	16	16	12	
prerequisites	EngStatics	Mech of Material	CivEng1 and co-Mech of Material	Mech of Materials, IntroGeology	Chemistry 1B		
Fourth year	Civ3031F	Civ3035S	Civ3042s/4034F	Civ3038F/Civ3043F	Civ3044F	Civ3045F	Civ3047S
Courses	Structural Eng2	StructuralEng3	Geotech2	Hydrolic2	EngHydrology		
Credits	16	16	16				
prerequisites	Structural Eng1	StructuralEng2	Geotech1	CivFluidMech			

Figure B3 Guideline of the first 4 years of the civil engineering curriculum for ASPECT students

First year							
Courses	Maths 1	ElecEng1	Physics 1	Comm1			
Credits	32	32	32	8			
prereq							
Second year	EEE1003W	Mec1003F	Mam1045S	CAS1001S	EEE2038W	EEE2039W	Mam2080W
Courses	ElecComputing	Drawing1	ElecModelling	Africa culture	ElecEngFund	ElectroFund	Maths2
Credits	16	8	16	8	24	36	32
prereq					Maths1, Physics1	ElecComputing, Maths1, Physics1	Maths1
Third year	PHY2010S	EEE2035F	Mec2043F	Mec2026S	EEE2036S/F	EEE3069W	EEE3017W
Courses	Electromagnetism	Signal 1	ElecMecMaterials	ProjectManage	Probability	ElecControl	DigitalElec
Credits	16	12	12	8	12	20	16
prereq	Physics1	Maths1, co-Math2	Physics1		Maths1	Maths2, Signals1, ElecEngFund, ElectroFund	ElectroFund
Fourth year	EEE3055F	EEE3057S	EEE3068F	EEE3083F	EEE3086F	EEE4036C	EEE4093F
Courses	ElectromagEng	PowerEng	ElecCircuits	CommSystem	Signals2	ElecDesign	ProcessControl
Credits	20	20	12	12	12	8	20
prereq	Maths2, ElecEngFund, ElectroFund	ElecEngFund	ElectroFund	ElectroFund	Signals1, Probability	PowerEng, or ElecControl and Signal2	ElecControl

Figure B4 Guideline of the first 4 years of the electrical engineering curriculum for ASPECT students

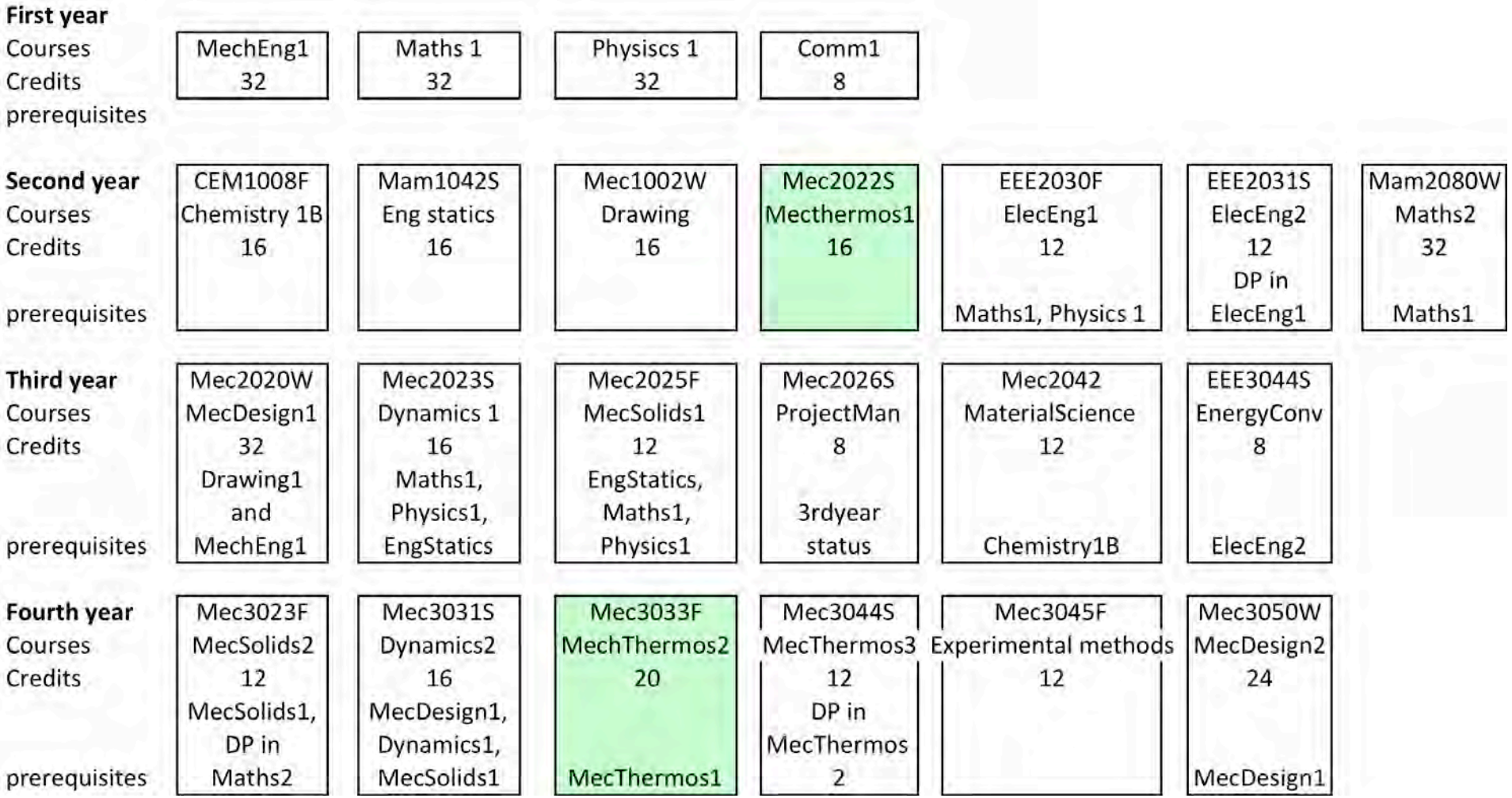

Figure B5Guideline of the first 4 years of the mechanical engineering curriculum for ASPECT students