

University of KwaZulu-Natal

An investigation into the retention and dropout of
mechanical engineering students at a FET College

December 2008

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Submitted in partial fulfillment of the academic
requirement for the degree of Master of Education: Adult
Education.

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Acknowledgements

1. I express my sincere thanks to my supervisor Sandra Land for her guidance.
2. Thank you to my wife Kushil and my two children Lavan and Lesna for their patience and support.
3. I am grateful to the FET college sector for the funding and support provided.
4. A big thank you to all the FET staff and students in mechanical engineering who were always willing to help me in my research.

Abstract

This study investigates the retention and dropout of mechanical engineering students at a FET college using the interpretivist paradigm. Three key questions are addressed:

- (1) What motivates the students to enroll for mechanical engineering?
- (2) What are the factors that contribute to the dropout or retention of students in the mechanical engineering field of study?
- (3) What are staff and students' perceptions of the Student Support Department?

Tinto's Student Integration Model (SIM) was used as a framework within which the student retention or dropout in mechanical engineering was investigated. Also related to student retention or dropout is motivation, hence two motivational theories namely the Achievement Motivational Theory by McClelland and the Model for Expectancy for Success by Wigfield, Eccles and colleagues were used to structure this discussion. The literature review also incorporates a discussion regarding the various factors that affect student retention or dropout. Perceptions regarding the newly established Student Support Department were also investigated.

To obtain a good understanding of the student retention or dropout at the FET College, various methods were used in gathering information such as documentary analysis, a student survey and two separate focus group discussions for students and lecturers.

From this investigation the findings indicate:

- (1) that employment opportunities strongly motivate students to study mechanical engineering. Other factors that motivated students were career guidance and parental influence.
- (2) that effects of apartheid's Bantu education continue to have an impact on student retention especially for the black African students who are in the majority at the FET college. Other factors that contribute to retention and drop out of students include academic integration, setting of goals, classroom environment, finances and academic under-preparedness of students
- (3) that the Student Support Department has a critical role to play at the FET college by providing a range of student support services.

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Chapter 1 Introduction

Firstly, I would like to give a brief history of South African FET colleges (previously known as Technical colleges) to show their important contribution to education. Fisher et al (2003) describe the history from 1923 when colleges operated under the Higher Education Act of 1923 and thereby enjoyed considerable autonomy and active support from local business and community leaders, and responded strongly to local demands and to the demands for adult, continuing and leisure education. Vocational education offered by these Technical colleges was highly successful. Fisher et al, (2003, p. 329) explain that the scenario changed after the National Party came to power in 1948, and this contributed the decline of technical and vocational education at technical colleges by their promoting vocational and technical education at schools in rural Afrikaans areas far from the urban centres. Although this may appear to be a positive step in vocational education, it resulted in promoting a school vocational education system while neglecting a successful and effective technical college system. According to Fisher et al, (2003, p. 329) from then on Technical colleges were neglected and not strongly supported financially by the government. Furthermore, Fisher et al, (2003, p. 329) point out that “Technical and vocational education for black people had been limited and was further distorted under apartheid.” This distortion can be seen in the statistics shown below which show that whites made up the most graduates (almost two thirds) at the Technical colleges in 1991.

TABLE 1 Technical college enrolments 1991

Whites	50907
Indians	5327
Coloureds	5711
Africans	11644
TBVC States	2846
Total	76435
Source: (TVET Sector Review (1992 4 21)	

HRD Review(Fisher et al, 2003, p. 330)

One of the ways of solving South Africa’s skills shortage according to Akoojee (2008, p. 305) is that “the FET sector needs to have a larger intake than higher education”. Akoojee

(2008, p. 305) cites statistics from DoE 2006c which show that the FET college system had 377,584 learners in 2005 which does show growth when compared to 76435 from 1991. However, when compared with the targets set by the government Akoojee (2008, p. 305) points out that “This number is vastly lower than the one million envisaged in ministerial speeches, and considerably below the 737,472 learners in the higher education sector.” This means the growth of the FET College sector is lagging behind.

One way the newly elected government tried to address the injustices and imbalances of the apartheid was to change the law (acts) governing the Technical colleges. This led to the introduction of the Further Education and Training Act No 98 of 1998 which was later replaced by the Further Education and Training Act no 16 of 2006.

For comparison of attempts to try and correct the injustices of the apartheid era it is useful to look at a similar model run by Australia in Vocational education and training (VET) sector under Technical and Further Education (TAFE) institutes. Essentially, this model as described by Helme (2007) was formed to address the lack of participation of indigenous aborigines in education due to colonial injustices. Helme (2007, p. 453) states “Its strengths are based on its ability to accept adult students who have not completed secondary education into lower-level programs, and to offer a pathway through to higher level programs and qualifications, and, ultimately, into employment.” Helme (2007, p. 453) reports that there has been an explosion in indigenous enrolments in the VET sector over the past two decades, which far outstrips increases in secondary and higher education. Statistics from TAFE institutions show enrolments have increased from “3300 in the 1980s to 62,700 students in 2005” (Helme, 2007, p. 453). According to Helme (2007) the VET sector has become the ‘Sector of Choice’ for the indigenous people as they are also given a second chance in education if they did not do well at school.

In trying to make the FET college sector grow to the government’s target of a million students the department followed the TAFE model from Australia. This prompted the government to develop a the new Further Education and Training Act (no.16 of 2006) with its main aim of making FET colleges function more like businesses. One of the

major implications of this act is that much of the power has been transferred to the college council. This implies that the college will be responsible the finances, staff members and the curriculum offered. Firstly, with regard to funding there will be less financial support from the state and therefore the college has to spend the funds wisely. This in turn means that some of funds raised will be through college fees. In relation to this, Akoojee (2008, p. 299) cautions FET colleges, that there is the possibility for mismanagement at the local institutional level especially when national systems of audit and accountability have been considered to be weak. Apart from these considerations, colleges need to improve their retention of students in order to improve their financial independence. Thus with the implementation of the new Further Education and Training Act, more focus will be dedicated to the retention of students.

Secondly, this act differs from the Further Education and Training Act no 98 of 1998 primarily in chapter 4 where the staff will be employed by the college council. This will give the college council flexibility to offer higher staff remuneration packages with a view to reducing staff turnover. However, Akoojee (2008, p. 303) believes that the handing down the responsibility of being an employer to college council members appears to be naïve and hence he suggests that the college council members need to undergo training with regards to their duties. The FET College is currently in a transitional stage during which the college council is being empowered to take on the role of the employer while the college is still accountable to the government through the Department of Education.

Thirdly, the FET College had a change in curriculum. Forrest (1987, p. 62) emphasizes that “virtually all colleges and universities have felt the pressure in recent years to convince students and the public alike that general education programmes successfully prepare students to function effectively in adult society. They are under pressure to demonstrate the relevance of general education.” Prior to offering a course the college has to conduct research or use research conducted by other organizations in establishing the employment opportunities for which the course will equip students. One of the reasons for the introduction of the new curriculum was to make the college offer

programmes that will address the scarce skills of the local and national economy. By doing this the college will be offering needed programmes. Also, the new curriculum being implemented is funded by the government. Unlike the previous years the new funding norm is based on the throughput rate. From the college perspective, this means that enrollments for the higher levels will be dependent upon retention of students. The more students the college retains the more funding the college will receive. This policy makes it very much in the interests of the college to retain students, and makes it more likely that more students will gain knowledge that they can use to seek employment.

Currently the South African government is continuing to support the FET college as one of its means to attain its strategy of reducing unemployment and upgrading people's skills. During her budget speech, in February 2006 the National Minister of Education, Naledi Pandor, focused on the following in relation to the FET sector:

- (1) the need to popularize and affirm the profile and prospects of further and vocational education.
- (2) that there will be more funding for FET colleges so that the colleges become leading skills training centres. The Minister announced that R2 billion has been set aside for the fifty FET colleges in the country for recapitalization. This recapitalization money will be used for staff training, purchasing new equipment, teaching and learning materials and upgrading of infra structure.

The Minister of National Education went further in her media release in November 2006 (Ngqengelele, 2006) to confirm her commitment to FET Colleges. Here is a summary of the most important changes she proposed:

- To attract more students to the FET College Sector.
- To provide financial assistance in the form of bursaries and student loans. (this was also confirmed by the Minister of Finance, Trevor Manuel, in his Midterm Budget Speech : *25 October 2006*)
- To redesign the curriculum offered at FET Colleges.
- Inviting employers to look the FET Colleges to address the critical shortages of skills in industry.

After understanding the brief history and importance of Technical and Vocational education I believe that increasing student numbers, and changing laws or curriculum do play a role in changing the technical and vocational education landscape but the question arises “Is the FET college able to deliver a quality product in the end?” One way of answering this question is to conduct research into student dropout and retention at a college where I have twenty years of experience ranging from teaching accounting in the classroom to managing various departments such as short skills courses, marketing and quality assurance. While working in these departments I noticed that the FET college was spending large amounts of money and time to market the FET college. Of course the FET college was subsidized primarily by the government and this acted as a safety net and a guarantee that funding would be received. The enrollments statistics of the FET college for the past three years indeed shows that there is growth in student numbers as indicated below.

Year	2006	2007	2008
Enrollments (Head count)	7334	8210	9218

From this marketing effort the college has shown growth in terms of student numbers but my concern was how many of these students does the college retain to complete their studies.

Since 2005 the FET college has become a strong focus of the government and many changes have been implemented such as the new Further Education and Training Act (no. 16 of 2006), implementation of a new curriculum, and the establishment of the Student Support Department. With all these changes, the expectancy from the government is that students will acquire the necessary skills by remaining at FET colleges to complete their studies.

Most of the research conducted in student retention in South Africa thus far has been completed on university students. The trends at local and overseas universities are similar. According to Tinto the trend at universities is that more than fifty percent of the

students leave the university in the first year. Tinto's research shows that "Of the nearly 2.8 million who in 1986 will be entering higher education for the first time, over 1.6 million will leave their first institution without receiving a degree" (1987, p. 1). Since no research thus far has been conducted on dropout and retention at FET Colleges in South Africa I have decided to research this topic and to establish if there are similar trends when compared to universities.

To help me understand the student dropout/retention at the FET college I have chosen to investigate students studying mechanical engineering. The college management suggested that I investigate the mechanical engineering because

- I was lecturing in the accounting field and therefore I would be more objective in my research in the engineering field.
- I would be interviewing lecturers who do not interact with me that often thus they would be more open and honest with me.
- I would be interviewing students who I will not have interacted with and therefore they would be honest and open with their views.
- the college needed to understand the students' and lecturers' viewpoints and feelings that are not reflected in quantitative data.
- By investigating one group of students namely the mechanical engineering students at a FET College I would be investigating a sample which could give an indication to college management as well as the Student Support Department of the interventions, programmes and policies that they could implement regarding student retention.
- Artisan skills in mechanical engineering have been identified by the Merseta as one of the critical skills in South Africa and therefore retention of these students is important. The Merseta SSP (skills sector plan) Review, (2007, p. 73) states that "The consultative process within the MERSETA chambers indicates that the total number of scarce skills required to fill scarce skills occupations within the industry by 2010 is at least 78273. More than three quarters (79%) of the reported "scarce skills" lie within occupational major group 3 category

(Technicians and Trades workers).” This category represents the prime skills that the mechanical engineering courses is trying to address.

- the number of students graduating from the mechanical engineering field was lower than those in electrical engineering.

Three questions that I want to answer in my research are:

- What motivates the students to enroll for mechanical engineering?
- What are the factors that contribute to the dropout or retention of students in the mechanical engineering field of study?
- What are staff and students’ perceptions of the Student Support Department?

Before I discuss my three questions I need to point out the many advantages of studying at a FET college when compared to universities and other private institutions. Firstly, the mechanical engineering course has 3 levels namely N4, N5 and N6 and each level is completed in ten weeks (called a trimester) which effectively means that students can finish the course in one year. Secondly, the fees are affordable, for example in 2007 the fees were R1710 per trimester. The FET college’s main aim in setting low fees was to make education accessible to as many students as possible. Thirdly, students who do not qualify to enter university to study mechanical engineering have the option of studying at the FET college. Fourthly, a huge advantage of studying at the FET college is that after each trimester the student obtains a National Certificate if the student passes all four subjects for that level. Fifthly, if a student decides to change courses this can be done after ten weeks, and so does not cost the student much. Sixthly, if students fail any of their subjects, they are afforded the opportunity to rewrite these subjects for as little as R100 per subject. Seventhly, a student has two chances to rewrite subjects in the first year. This allows the student to regain any losses. Finally, if a student completes the highest level of N6 at the FET college and has evidence of at least a minimum of two years relevant mechanical experience in the workplace then the student qualifies for a national diploma. This diploma has theory and practical components with the practical component making up more than two thirds of the qualification.

One would think that the above advantages of studying at the FET college would be motivation in itself but does this really translate into positives like the retention of students? The Expectancy for Success Model, and Achievement theory are two motivational theories that I will be using to explain the motivational aspects that play a major role in the retention of students.

The second question in my research identifies the various factors that can affect student retention. Of particular interest to me was the impact of the apartheid policy on the retention of students even though the country moved away from this policy more than fifteen years ago. Using Tinto's model as a basis some of the factors that affect student retention that will be discussed such as academic and social integration, finance, setting of goals, disadvantaged or black students, under-preparation and the classroom environment.

The third question in my research is concerned with be the perception of the staff and students of a fairly new concept in the FET college known as the Student Support Department and understanding their role in supporting students which can ultimately impact on the retention of students.

Business also has an interest in education and will also be concerned with the quality of skills that students acquire. McGrath and Akoojee (2009) point out that there is renewed interest in skills provided by vocational education in view of businesses adopting the concept of globalization. Multinational companies who implement a policy of globalization prefer investing in a country where the people have the skills that they require to make their businesses economically viable. One of the suggestions made by Butler et al (2007) is that FET colleges need to have increased capacity to link with business, industry, and other advanced education and training programs. According to Gates (2008, p. 1) "As we enter the twenty-first century, it is clear that education is, indeed, the best investment that we can make, for an information economy depends upon a knowledgeable, skilled, educated workforce". Many commentators in education also

agree with Gates that education should be regarded as an investment. So, if a student enrolls at a college or university then that student and his/her family have made an investment. With every investment the logical conclusion is that there must be a return from this investment. In education, the return is considered when the student graduates and takes up his/her rightful place in society. Generally, when students leave education institutions without graduating then the expected return has not been achieved. This leads to wastage of resources.

Looking at the changes implemented at the FET colleges recently as well as financial support provided by the government, the changing of the curriculum, and the establishment of a Student Support Department I think that the time is right to start building a pool of knowledge regarding the retention of students at the FET college.

Chapter 2 Literature Review

This chapter starts by discussing concepts referred to in literature relevant to this study, and moves on to a review of the literature. In trying to discuss the literature regarding retention/dropout of students there are many concepts or terms that are used by different authors that need to be explained to make understanding clearer. In this chapter the discussion of the concept of motivation will include the definition of motivation, as well as the concepts of intrinsic and extrinsic motivation. Thereafter, other concepts related to retention will be discussed such as dropouts, stopouts, peer groups, persistence, non traditional students, traditional students, withdrawal, attrition, dismissal, retention and mortality.

Thereafter I will discuss the literature associated with retention studies which will include some of the terms mentioned above. The literature review will: firstly discuss motivational theories, namely: a Model of the Expectancy-for-Success Construct and McClelland's Achievement Motivation Theory. Secondly **it will** focus on the most influential retention theory, called Student Integration Model by Tinto as well as criticisms against this theory, and thirdly discuss the factors affecting retention such as:

- academic and social system interaction
- setting of goals
- black students or disadvantaged students
- financing of students
- classroom environment
- academically underprepared students

Finally, it will discuss aspects relating to student support such as academic advising, learning assistance programmes and student orientation.

2.1 Concepts referred to in literature

2.1.1 Motivation

Definition of Motivation

There is much disagreement among motivational theorists about the nature of motivation, but Pintrich and Schunk (1996) provide a general definition of motivation which they state is “the process whereby goal-directed activity is instigated and sustained” (Pintrich and Schunk, 1996, p. 4). This definition implies the following: Firstly, according to Pintrich and Schunk, (1996, p. 4) “motivation is a process rather than a product.” This implies that motivation cannot be observed directly but motivation causes people to behave in a particular manner which is observable, such as choice of tasks, or like studying the mechanical engineering course. Then by observing these behaviours the level of motivation can be inferred. Secondly, “motivation involves goals” (Pintrich and Schunk, 1996, p. 4). According to Pintrich and Schunk (1996), setting goals helps the student to focus on the direction of his actions, e.g. I want a mechanical engineering diploma. Thirdly, “motivation requires activity—physical and mental” (Pintrich and Schunk, 1996, p. 5). For Pintrich and Schunk, physical activity means that the student puts in an effort or persists in tasks and other observable actions, e.g. attending mechanical engineering lectures. On the other hand mental activity involves the student engaging in thinking which involves planning e.g. planning his career path. Fourthly, “motivated activity is both instigated and sustained” (Pintrich and Schunk, 1996, p. 5). Pintrich and Schunk (1996), use instigated to mean that a person begins an activity, e.g. enrolling for the mechanical engineering course. Once a person has embarked on a field of study then that person must be further motivated to go to the end which means he has to sustain his motivation. Many students will encounter difficulties but if they are able to sustain what they have commenced with then they will be able to complete the course.

Intrinsic Motivation

According to Reiss (2005, p. 1) “Intrinsic motivation refers to motivation that comes from within a person that is doing something because you want to.” Deci and Ryan (1987, p. 34) explain that intrinsic motivation means that a person performs an activity

despite the absence of an external reward when it is based on two fundamental aspects namely competence and self determination. Competence means the ability to do something. When a person is intrinsically motivated then they will seek challenges that are not too difficult or easy for their abilities. Deci and Ryan (1987, p. 38) state that “Another way of explaining self determination is the capacity to choose and to have those choices rather than having external rewards or being coerced.” For example a student enrolls for the course because they believe within themselves that they have the necessary skills and knowledge to cope with the course.

Extrinsic Motivation

“Extrinsic motivation is motivation to engage in an activity as a means to an end” (Pintrich, and Schunk, 1996, p. 258). Pintrich and Schunk (1996) mean that there is a reward at the end of a particular task which a person will work towards attaining. For example, a student may choose mechanical engineering because he/she may believe that this course will place him in a better position to obtain a good job in the mechanical engineering.

2.1.2 Concepts Relating to Retention

Defining the term “Dropout”

Tinto (1987, p. 130) notes that generally many institutions regard all forms of leaving as dropping out, which they consider as important because dropping out impacts on the institution’s financial resources and ultimately affects the institution’s survival. This Tinto views as a mistake which he justifies with the following reasons:

Firstly, there are a variety of reasons for departure and therefore institutions must have also have a variety of strategies in handling dropouts not just a single policy.

Secondly, sometimes a student may leave an institution regardless of the retention programme adopted by the institution. As a result resources will be a waste on these students because they are going to leave anyway. According to Tinto (1987, p.133) some students may understand their departure as quite a positive step. Astin (1976, p. 6)

supports Tinto in this regard when he states that “students have their own goals and plans.” This means that some students may enroll at a college with no intention of finishing with a diploma in mechanical engineering. According to Tinto (1987, p. 133) some students’ educational goals do not call for degree completion. Similarly, to assume that every FET college student who does not complete a diploma in mechanical engineering is a dropout is not correct.

Thirdly, Tinto (1987, p. 132) argues strongly that the term dropout sometimes creates a perception that the individual has failed to meet the academic and social standards of the institution. He points out that this is not always the case, and suggests that the institution may also be partially responsible for the individual’s failure. Therefore, according to Tinto “defining dropout appropriately is no simple matter” (Tinto, 1987, p. 131). However, according to Tinto, “when individuals and institutions have the same view that is personal failure then the term dropout is best applied” (Tinto, 1987, p. 133).

Furthermore, Tinto (1987) was concerned that the term ‘dropout’ tends to have negative connotations and therefore he suggested that the term ‘departures’ be used instead.

Tierney does not agree with the term “dropouts”, and states “In traditional cultures rites of passage do not have notions such as “departure”, “failure” or “dropout” (Tierney, 1992, p. 609). Confirming Tierney’s point of view are anthropological studies conducted on the Arunta (a technologically undeveloped group of non Western culture) and the Hutterites (a group of Western culture) in terms of which “there are no failures or dropouts” (Trueba, Spindler G., and Spindler L, 1989, p. 11). However, the models proposed by Tinto, Astin, Pascarella, Bean and many other researchers still use the terms “departure”, “failure” or “dropout.”

Stopouts

Astin (1976, p. 9) explains the term stopouts as “students who interrupt their undergraduate education for a relatively brief period and return to complete the degree.”

Peer Group

Astin (1996) views a peer group from two perspectives: firstly, from the individual or psychological point of view and secondly, from the group or sociological point of view.

From the individual point of view “a peer group is a collection of individuals with whom the individual identifies and affiliates and from whom the individual seeks acceptance and approval” (Astin, 1996, p. 400). From a sociological perspective a “peer group would be defined as any group of individuals in which members identify, affiliate with, and seek acceptance and approval from each other” (Astin, 1996, p. 401).

According to Astin (1996) there is a sub group of a peer group which is known as Peer SES (Socioeconomic status). This group consists of students who come from similar socioeconomic backgrounds and according to Astin (1996, p. 407) “Peer SES has its strongest effect on completion of bachelor’s degree.” Astin (1996, p. 407) concludes from his research “In short, these findings show that this means that students who come from high SES families can look forward to more positive outcomes in college, regardless of their abilities, academic preparation, or other characteristics”.

Persistence

By this is meant the quality of students who continue study despite facing many challenges and as Tinto (1987, p.49) mentions, they will “stick it out.” What are some of the reasons for this? According to Tinto, these students must show a strong commitment and individual goals. Anthropologist, Suarez-Orozco, who studied immigrants, found that students’ families played an important role in assisting these students in coping with the challenges which assists students to persist despite being in another country. (Suarez-Orozco, 1989, p. 105). According to Tinto (1987, p. 51) many students who experience difficulties in meeting the academic performance will continue, and only leave when they are forced to.

Nontraditional students

According to Valverde (1987, p. 78) “The term “nontraditional” student was coined to include older persons, women, language-handicapped persons, under achieving white youths, the physically handicapped, and so on, as well as ethnic and racial minority students.”

Traditional Students

According to Astin (1996) these students are between the ages of eighteen and twenty two years and live at the university residence and study on a full time basis.

Berger and Lyons (2005, p. 7) provide a list of definitions for terms used in retention:

Withdrawal

Departure from the college campus.

Attrition

This means that the student does not re-enroll in the consecutive terms.

Dismissal

The institution does not permit a student reenrollment

Retention

The institution is able to keep the student from the first year to graduation.

Mortality

Failure by the student to remain at the college up to graduation.

2.2 Review of related studies

2.2.1 Introduction

Yorke and Longden (2004) state that research into student retention and student persistence at universities has been carried out for more than fifty years particularly in the United States.

Motivation is one of the common threads that run through student retention theories and confirming this are comments made by some leading authors in student retention.

“Student retention or the lack thereof was seen as the reflection of individual attributes, skills and motivation. Students who did not stay were thought to be less able, less motivated, and less willing to defer the benefits that college graduation was believed to bestow” (Tinto, 2006-2007, p. 2).

“Full integration into any environment depends upon a person’s motivation” (Valverde, 1987, p. 84).

“If a student is not particularly motivated as regards their programme, then their persistence and success are at risk” (Yorke and Longden, 2004, pp. 82-83).

Not only is motivation important in student retention theories but also in academic advising which is one of services provided by the Student Support Department. Frost, (1991, p.30) states that “Motivation is the primary focus of academic advising”.

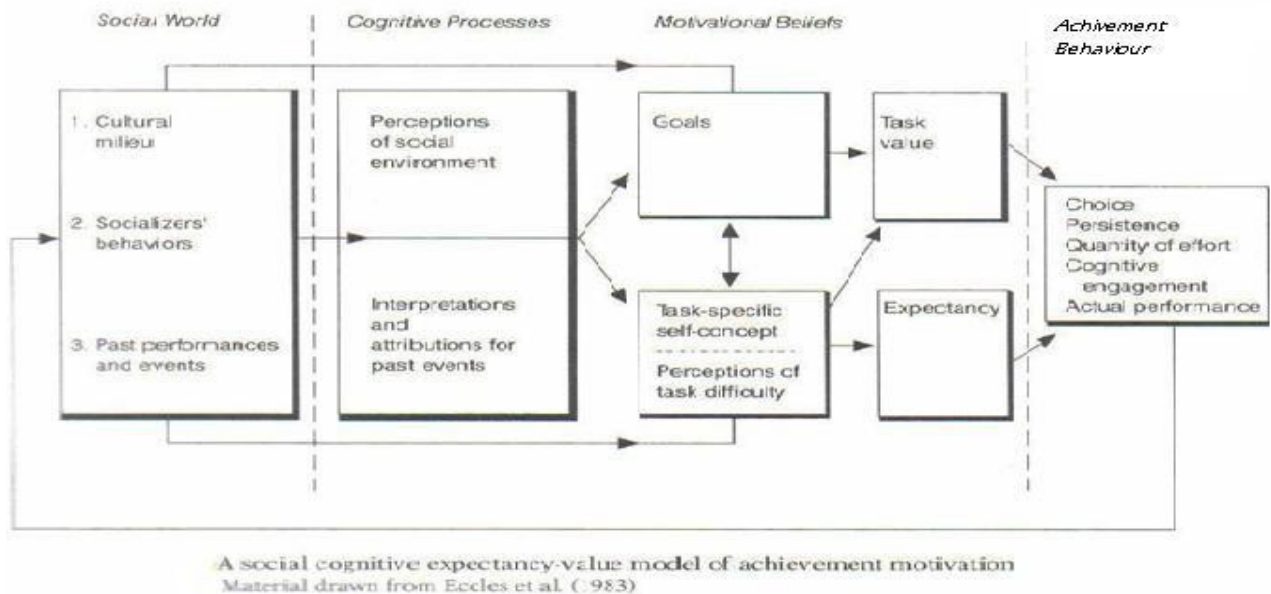
2.2.2. Motivational Theories

Success and achievement are two concepts that are necessary to motivate students to continue with their studies. Therefore I have chosen two relevant motivational theories, (1) A Model of the Expectancy-for-Success Construct by Eccles and Wigfield and colleagues (1983, 1992) and (2) the Achievement Motivation Theory by David C. McClelland (1976), that explain the concepts of success and achievement.

A Model of the Expectancy-for-Success Construct by Eccles and Wigfield and colleagues (1983, 1992)

The model of Expectancy-for-Success Construct is relevant because during my twenty years of teaching at the FET college I have observed that students enroll for courses, like mechanical engineering, because they expect to be successful. This model helps to highlight the concepts that a student should focus on in order to be successful in mechanical engineering at the FET College like the Expectancy and Task Value.

According to Pintrich and Schunk, (1996, p. 77) “The Expectancy for Success Construct Model is a direct descendent from Atkinson’s Expectancy – Value Model” (1957, 1964). However, the Expectancy for Success Construct Model only included two of the three components from the Atkinson’s model namely Expectancy and Task Value. Pintrich and Schunk (1996) simplified this elaborate model by using the diagram below.



Pintrich, P.R. & Schunk, D.H. (1996)

The diagram above shows that achievement behaviour is predicted by two general components namely Expectancy and Task Value. Looking closely at the diagram it can be observed that the authors have placed these two constructs within the dashed lines which indicate that they are internal, cognitive beliefs of the individual while achievement behaviours are overt and observable. The authors explain the Task value construct simply provides answers the question “Why am I choosing to study the mechanical engineering course?” This implies that a student must have a goal in mind e.g. the student states that “I want to be a mechanical engineer.” Expectancy as Pintrich and Schunk (1996, p. 77) explain it refers to the actual beliefs that the student has about his/her future expectancy for success. This means that the students who choose mechanical engineering believe that they will succeed and eventually graduate as mechanical engineers.

Looking at the diagram the two other components that also impact on expectancy are students’ task specific self concept and perceptions of task difficulty. According to Pintrich and Schunk (1996, p. 78), this means that when a student enrolls for mechanical engineering he/she may think that working with machines might be difficult task but that they will be able to cope with the level of difficulty. Hence they expect to perform the tasks successfully and consequently develop a higher self perception.

In addition, from this model it is observed that a person’s self concept is also influenced by other variables such as external factors which include culture, interaction with parents, peers and teachers as well as the student’s past performances and achievements. To further highlight the significance of these variables in the Expectancy for Success Construct Model some interesting findings from anthropological studies are: Firstly, Trueba, Spindler G., and Spindler L. (1989, p. 4), cite Gibson who states that “there is increasing evidence in the United States, Great Britain, Australia, and Canada, that children of immigrants persist in school longer and have stronger academic records than non-immigrant youth of similar social class backgrounds”. In another anthropological study, Suarez-Orozco (1989, pp. 100-101) describes experiences of immigrants who

became refugees from Central America as a result of political conflicts and power struggles. She explains that these immigrants often feel guilty because they have left their families in the conflict situation while they are trying to improve their education. Many of these immigrants settled in America and attended the worst inner city schools, worked to support the family, had language problems and had numerous social problems but continued to attend school rather than drop out. Why was this so? Suarez-Orozco (1989, p. 107) points out that not all immigrants carry this burden of guilt mentioned above but that they are highly motivated to succeed despite the hardships. Another reason for better performance is the expectation of parents. Cuban states that “The international and comparative literature indicates quite clearly that immigrant parents have higher expectations for their children’s success in school than non-immigrant parents of similar class background. Immigrant youths are less likely than non immigrants to relinquish their goals of college education even when they experience academic difficulties” (1989, pp.127-128).

Finally, Pintrich and Schunk cite Eccles, 1993, Wigfield, 1994, and Wigfield and Eccles, 1992, who in their research found that higher expectancies for success are positively related to all types of achievement behaviour, including achievement, choice, and persistence (Pintrich and Schunk, 1996, p. 77).

Achievement Motivation Theory by McClelland

Another factor that is important for student retention is achievement. At the FET college I have noticed that some students are high achievers while others are low achievers. “High achievers are people with strong achievement motives who would seek out situations in which they could get achievement satisfaction” (McClelland, 1976, p. 46). In addition, McClelland (1976) in his Achievement Motivation Theory mentions that students may have other needs that can motivate them such as (1) need for achievement, (2) need for affiliation and (3) need for power. McClelland (2007, pp. 1-2) describes the need for achievement as when a person sets challenging but realistic goals and when successful experiences a strong sense of accomplishment. This person also needs constant feedback on the progress made. The need for affiliation is driven by the motive that the person

wants to be liked by others. This person likes to work in groups and is usually a team player. Lastly, the need for power is driven by the motive for prestige and this person wants to be a leader.

2.2.3. Retention Theories

Interest in retention has led to a variety of theoretical constructs being developed which relate to student success, though certain theorists have focused attention on certain aspects. Some of the theoretical literature on student retention focuses only on one discipline at a time such as psychology (Bean and Eaton 2000), sociology (Tinto 1993) and organizational behaviour (Bean and Metzner 1985). Yorke and Longden (2004) explain that not all retention theories formulated follow a single discipline as do the examples mentioned above. According to Yorke and Longden (2004) other retention theories developed used more than one discipline such as Astin's (1991) I-E-O (input-environment-output) model which uses psychological constructs, behaviour and economics, whereas Caberra et al. (1992) fused models developed by Tinto and Bean and Metzner (1985) and finally Sandler (2000) expanded on the fused model to include older students. Finally, Braxton and Hirschy (2004, p. 89) state that "Although economic, organizational, psychological, and sociological perspectives undergird studies of student departure, Tinto's Interactionalist Theory of college student departure holds paradigmatic status." Here follows a discussion of the Student Integration Model by Tinto.

Student Integration Model – by Vincent Tinto

Tinto formulated his path model based on Van Gennep's anthropological study of rituals and ceremonies and Durkheim's Suicide Model.

Tinto used Van Gennep's anthropological study as described in his book *The Rites of Passage* (1960) as a framework from which to develop his theory of student departure (1987, p. 91). He describes the framework of Van Gennep which was concerned with "life crises" that individuals and groups face during their lifetime. Thus, Tinto (1987, p. 91) explains that Van Gennep envisaged life as a series of passages leading individuals from birth to death and membership from one group or status to another. Van Gennep

stated that to mark this movement from one group to another, societies held rituals and ceremonies from which he identified three distinct phases or stages referred to as separation, transition and incorporation (Tinto, 1987, p. 92). Each of these phases is briefly described by Tinto: In the first phase namely, the separation stage, the individual is separated from his past associations. This stage is then followed by the transition stage whereby the individual undergoes training and sometimes isolation. The final stage namely, incorporation, is when the individual acquires membership to the new group together with responsibilities. Tinto adopted these three stages as his conceptual framework to explain his Theory of Integration. Tinto (1987, p. 95) explains the first phase of separation in his theory as when the student is separated from his past community (family, school, and friends) and in the meantime has enrolled at the college or university as a student which now forms a community that may have a different set of norms and values. This separation is sometimes stressful, especially to a student who has to move away from his residence or rural community or religious group. If the situation is too stressful then the student may decide to depart. If the community from which the student comes accepts that leaving school and joining college is a normal movement stage in the student's life, then the student does not find separation difficult. In the second stage, namely the transitional stage, which according to Tinto (1987, pp. 96-97) occurs between high school and college, the student tries to adapt to meet requirements of the college community. The degree to which transition occurs is dependent on numerous factors such as the influence of the past community, family and friends. Tinto (1987, p. 97) states that students from disadvantaged backgrounds, physically handicapped persons, non-residential students, older students, persons from minority groups and rural groups have greater problems in adaptation to college life as they are not adequately prepared for college life. The third stage Tinto (1987, p. 98) calls the incorporation into the society of the college. Tinto (1987, p. 98) explains that the first two stages occur very early in the student's college life. Unlike Van Gennep's study, the student's incorporation into the college is rarely marked by ceremonies or rituals. At the FET college there is no formal orientation programme or formal event to officially welcome and incorporate the student into college life. As Tinto (1987) states, there is rarely a formal incorporation into the society of the college. Instead, Tinto (1987, p. 98) states that the student is left to find

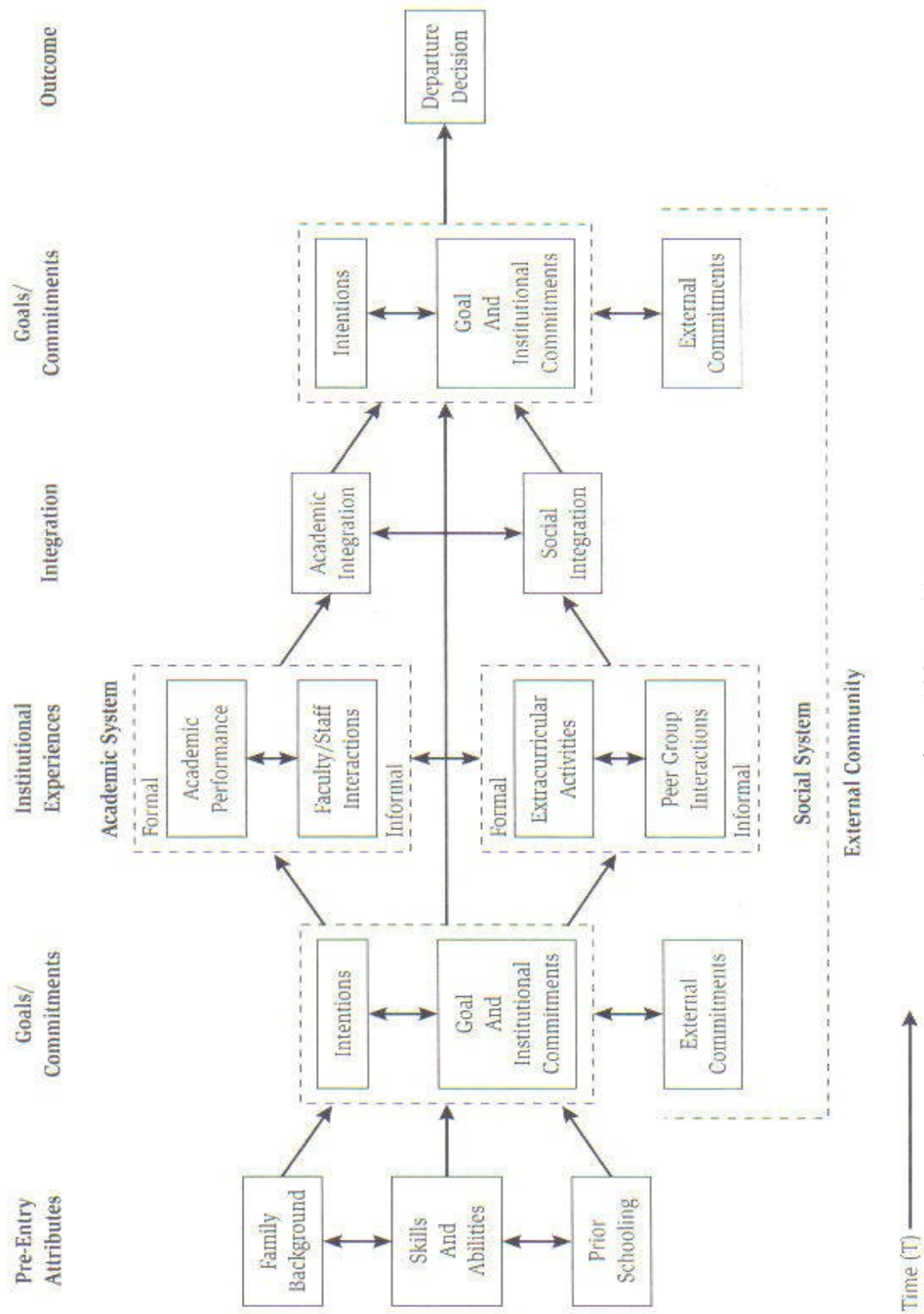
his own way through college. However, according to Titley (1987) orientation programmes are conducted by institutions in the United States. Titley (1987, p. 222) mentions research conducted by “Beal and Noel (1980) find orientation to be the third most effective retention activity overall; a number of institutions in their survey rank it as their most effective retention activity when focused on a special target group. Why it is so important is not immediately clear.” Tinto mentions that if there is any activity to mark incorporation then informal methods are used through societies and sports clubs. Hence, this has necessitated external assistance like family and friends to support students through college. Even though students may be incorporated into the society of the college, Tinto (1987, p. 98) notes that this does not guarantee persistence.

Van Gennep’s work does not explain the incorporation aspect fully, therefore Tinto (1987, p. 99) states that he is unclear as to how incorporation comes about. Consequently, Tinto used Durkheim’s suicide model to explain incorporation. Durkheim’s Suicide Model has four types of suicide. Tinto based his theory on the fourth type of suicide namely egotistical suicide which states: “Egotistical suicide is that form of suicide which arises when individuals are unable to become integrated and establish membership within the communities of society. Durkheim referred to two forms of integration – social and intellectual – through which membership is brought about” (Tinto, 1987, p. 101). A college or university has both social and intellectual components therefore it will be regarded as a community. Social components include the informal activities at a college while the intellectual aspect refers to the academic activities. If a student cannot fit into a new college or university environment both intellectually and socially then, the student will depart.

Another concept that Tinto (1987, p. 128) included in his theory was the importance of involvement when trying to incorporate the students into the society of the college or university which he said must be both social and intellectual. Also, supporting Tinto with involvement was Astin who developed his theory of involvement which according to him can be stated simply as: “Students learn by becoming involved” (1985a, p. 133). Astin (1984, p. 298) defines involvement as “the amount of physical and psychological energy

that the student devotes to the academic experience,". Astin (1996) conducted further research on undergraduate students' cognitive and affective development in which he used 57 involvement measures, and from which he concluded that "Learning, academic performance and retention are positively associated with academic involvement, involvement with faculty, and involvement with student peer groups" (Astin, 1996, p. 394). During this study Astin (1996, p. 395) also noted that "other forms of involvement impacted negatively on cognitive and affective outcomes like those that isolate student from peers or physically remove them from campus such as living at home, commuting, being employed off the campus, being employed full-time, and watching television."

Finally, Tinto developed a path model, graphically represented below, to explain his retention theory. Looking at this model you can see a path that the student follows, beginning from where the student comes from, and continuing as the student interacts with the institution formally and informally both on the social and academic levels. Thereafter depending on the student's experiences the path ends when the student decides either to stay or leave. The student will always commence from the left and proceed to the right.



Tinto, 1987, p.115

Criticisms of Tinto's theory

Tinto's theory was criticized by many but I shall focus on two critics namely Tierney, and Braxton and Hirschy. Tierney (1992, p. 611) criticizes Tinto's model from two perspectives, the understanding of the concepts of ritual, and culture. Braxton and Hirschy's (2004) criticism was based on Tinto's model and they suggest a revision of the model. Also included are Tinto's responses to some of the criticisms.

Tierney argues "that Tinto misinterpreted the anthropological notions of ritual, and in doing so he has created a theoretical construct with practical implications that hold potentially harmful consequences for racial and ethnic minorities" (Tierney, 1992, p. 603). Tierney explains that the rites of passage were designed in a particular culture, where rituals were used to move individuals from one developmental stage to another e.g. from childhood to adulthood. Furthermore, Tierney (1992) points out that Van Gennep used the term 'ritual' in the context of a single culture whereas when Tinto applies it to his model in the American society, where there are different cultures and minority groups. Thus, Tierney concludes "In short, if social integrationists are to employ an anthropological term, such as a ritual, then of necessity they must take into account the cultures in which those rituals exist. If one does so with regard to Tinto's model, one finds that he has developed an analytic tool that is dysfunctional: individuals from one culture, such as Apache, are to undergo a ritual in another culture such as Anglo." (Tierney, 1992, pp. 608-609).

Another aspect that Tierney criticizes Tinto on is 'culture'. From my everyday interactions on all the FET college campuses I am aware of the diversity of cultures reflected in the student population, which may have an impact on whether a student stays or leaves. The American higher education system as Tierney (1992) explains is strongly influenced by the white culture which is also dominant in their society. Not only was this culture dominant but it also had a special focus which Tierney (1992) clarifies when he states "Up until very recently in American higher education colleges and universities were designed to educate a clientele that was overwhelmingly composed of white males who came from the middle and upper classes" (Tierney, 1992, p. 608). From my

experience at the FET college I noticed that there still remains strong bias towards the white middle to upper class value system which was inherited from the apartheid era. For instance, examples used in teaching and in assessment are based on white middle to upper class which the majority of black students may find difficult to identify with. However, unlike the American colleges, from my observations the majority of students at FET colleges are non white students, who are being fitted into a culture of the white minority. Tierney (1992) argues that if the stages proposed by Van Gennep and supported by Tinto were applied to American Indians (a minority group), being forced as students into another culture, then this would result in the American Indian students having to break completely from their culture. This implies that when the American Indians (minority students) enroll at the college they enter into another new College culture. If these minority students want to succeed then they will have to adopt this new college culture.

Instead of having the above cultural scenario, Tierney (1992, p. 604) suggests that culture can be handled by institutions if they adopt a multicultural approach which allows for the respect of and acceptance of all cultures and ultimately results in success for students from all cultures. To do this Tierney (1999, p. 80) used the work of Pierre Bourdieu (1986), a French sociologist, who coined the term “Cultural Capital”. Firstly, Bourdieu states that cultural capital refers to the set of linguistics and cultural competencies that individuals inherit or sometimes learn. According Lovell (2000, p.26) Bourdieu also used the term “habitus” that means “ways of doing and being which social subjects acquire during socialization.” In explaining the concept of habitus, Bourdieu mentions that it is not acquired through conscious learning but through practice which he also calls ‘the practical sense’. He explains that cultural capital represents the collection of all forms of non economic forces such as family background, social class, resources and varying investments in education. Tierney (1999, p. 83) cites Bourdieu (1986) who states that cultural capital exists in three forms namely: embodied, objectified and institutionalized. Firstly, embodied capital refers to the mind and body. The embodied state is directly linked to and included within the individual and represents what they know and can do. People demonstrate this capital by engaging in traditional notions of art

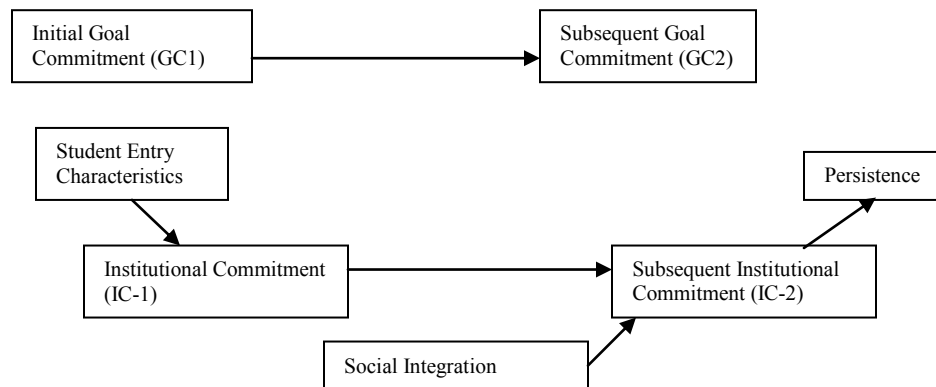
and cultivation and the appreciation of the arts. The embodied objects that form part of the culture of the community are objects such as paintings, and one example of where these items are normally found is in museums. Secondly, objectified capital does not only refer to the ownership of items but to the extent the objects are appreciated and enjoyed such as books, paintings, instruments and sculptures. Thirdly, institutionalized capital refers to the license that an institution gives to an individual so that they can take their place in society for example at a college the goal is to obtain a degree. According to Tierney (1999) minority groups attending white dominated culture colleges or universities can use cultural capital to overcome integration problems. This can be achieved, as Tierney (1999) explains, by the college or university if the minority group students are provided with embodied capital such as cultural objects to interpret and decode, objectified capital that allows students access to relevant textbooks and application forms so that these individuals can perform better in standardized tests. Finally, institutionalized capital allows the student to obtain a degree from the institution.

To strengthen his argument on culture, Tierney (1999, p. 84) cites a study conducted by Deyhle of native American children in 1995 which demonstrated that minority students performed better academically when their cultures were also accommodated in an institution. Tierney (1999, p. 84) stresses that merely providing financial assistance is not enough to make students succeed; the student's culture must also be considered.

In conclusion, Tierney (1999, p. 84) states that Tinto's theory suggests that for a student to be a success at college or university the student needs to shed his/her heritage (culture) but according to Bourdieu's habitus model, heritage (culture) shedding is impossible. As Tierney (1992, p. 616) suggests, instead of one culture dominating, we should build our colleges on understanding of all cultures so that we are all empowered and emancipated.

Braxton and Hirschy (2004, p. 92) strongly criticized Tinto's model. They cite Braxton et. al. 1997; and Braxton 2000a, and state that "Tinto's theory requires serious revision". According to Braxton and Hirschy (2004), Tinto's theory has 13 testable propositions which are interconnected. Of the 13 propositions only five propositions have produced

reliable knowledge about student departure. Of the five propositions only four are logically interconnected. Braxton and Hirschy (2004) illustrate the five propositions diagrammatically below

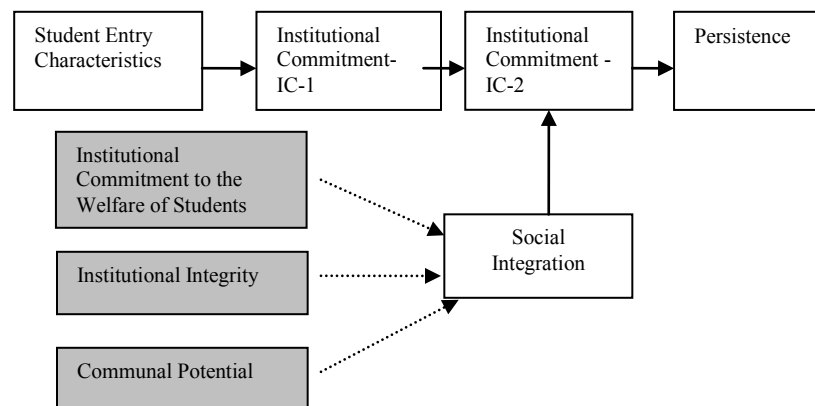


Note the arrows indicate strongly –supported propositions (Braxton and Hirschy, 2004, p.91)

After conducting 62 tests using the inductive method of research, Braxton and Hirschy (2004) were able to identify three empirical generalizations which they explain as follows: (1) Commitment of the institution to student welfare - refers to the manner in which faculty, staff and administrators interact with students. The more students perceive that the institutional commitment to welfare of students is strong, then the more students will want to participate in the college activities and this will lead to social integration. This generalization is important as all employees at the college should be interested in the welfare of the student. Also a student's voluntarily involvement in college activities will positively impact on the student. (2) Institutional integrity - through day to day interactions, student perceptions are formed about the consistency of institutional actions which must be in keeping with the institution's mission and vision. If there is a lack of consistency then students begin to become confused and disappointed which can lead to trust being damaged. Once trust is damaged then the student is less likely to participate in the institution which will result in poor social integration. This generalization also implies that the FET college should be honest when dealing with students and not

mislead or create false hopes. This means that all staff of the college must put into practice the college's mission and vision through their daily activities. (3) Communal potential refers to student's perceptions of relationships and values shared among their peers. Students who interact more frequently with peers develop greater social integration. The FET college must also provide students with the opportunity to develop not only academically but also socially. This will assist the student to develop more holistically. The problem that the FET college faces in this study is that the mechanical engineering course only lasts for ten weeks which makes it difficult to help students develop positive peer interaction, which is one of the factors identified earlier by Astin as an important factor for student retention (Astin, 1996, p. 398).

The generalizations mentioned above were used by Braxton and Hirschy (2004) to modify Tinto's Theory. They developed a model that is represented diagrammatically below.



Note: shaded boxes indicate new constructs; dotted lined arrows indicate new propositions.
(Braxton and Hirschy, 2004, p. 96)

Responses by Tinto to the above criticisms:

In a recent article Tinto acknowledges many of his critics when he states “Where it was once argued that retention required students to break away from past communities, we now know that for some if not many students the ability to remain connected to their past communities, family, church, or tribe is essential to their persistence” (2006-2007, p. 4).

Tinto further acknowledges limitations to his theory of student integration by stating “As we learned about the complexity of student retention, we have come to appreciate the limits of our early models of retention. We now have a range of models, some sociological, some psychological, and others economic in nature that have been proposed as being better suited to the task of explaining student leaving” (Tinto 2006-2007, p. 4).

2.2.4. Factors affecting retention

A discussion on the various factors that affect retention:

Academic and social system interaction

According to the model formulated by Tinto (1987, p. 113), the social and intellectual context of the institution and the formal and informal interactional environment plays a central role in the longitudinal process of individual departure. As many colleges and universities in the United States and South Africa run their courses for about a year, there is sufficient time for staff and students to develop a culture through meaningful interaction. For this interaction to impact positively on retention, it should include involvement which is confirmed by Tinto (2006-2007, p. 4) who states “Recently, involvement, or what is increasingly being referred to as engagement, matters and it matters most during the critical first year of college.” Also supporting academic and social interaction is Astin’s Theory of Involvement which states “Students who are involved in the academic life of the institution are more likely to expend the effort necessary to get good grades than are students who are not involved” (Astin, 1976, p. 100). Astin refers mainly to academic involvement as a form of interaction whereas Pascarella (1980, p. 549) cites a study by Grigg, who sampled 31 seniors from 31 colleges in 16 southern states in 1965, and suggests that those students who have frequent informal conversations with a faculty member were significantly more likely to graduate on a full time basis than those students who had infrequent contacts or not at all. While one would expect there to be informal conversation between students and college staff, it must be noted that most of the FET college students use English as their second language and therefore they may not be confident enough to have these informal conversations with lecturers. Consequently FET students may not be able to communicate their thoughts as intended and therefore informal conversations with lecturers may be limited.

In a more recent research project which was carried out involving 20 colleges and universities by Kuh G.D., et al, (2002-2003) in the United States of America, known as the Documenting Effective Educational Practice (DEEP), the main aim was to identify and document the practices of strong-performing colleges and universities. The criteria for selection of these colleges were (1) student success evidenced by higher-than-predicted graduation rates and (2) better-than-predicted student engagement scores on the National Survey of Student Engagement (NSSE). The results indicated that besides encouraging students to interact with the faculty, DEEP colleges and universities also give students different learning opportunities that complement their academic programmes. The activities mentioned below from the NSSE survey indicate that students are engaged in interactions, including:

“(1) having serious conversations with students of different race or ethnicity than one’s own, (2) having serious conversations with students with different religious beliefs, political opinions, and values, (3) using electronic technology to discuss or complete assignments, (4) participating in internships or field experiences, foreign language study, study abroad, community service, independent study, or a culminating senior experience, (5) participating in co-curricular activities and (6) having an institutional climate that encourages contact among students from different economic, social and racial or ethnic backgrounds” (Kuh G.D., et al, 2005, p. 219).

Tinto (1987, p.105) summarizes by stating that “colleges are normally made up of both academic and social systems, each with its own characteristic formal and informal structures and both these structures act on the students in different ways and eventually lead to the students departing or staying.”

The interaction through involvement as mentioned earlier by Tinto is critical during the students first year. McInnis and James (2004, p. 40) provide justification for this when they aptly describe students attending universities or colleges for the first time by stating “Some students find the first year a daunting, intimidating and alienating experience. Lack of readiness to cope with the demands of university study is often the source of these experiences and amplifies the doubts that students may have”. Consequently,

McInnis and James (2004) state that first year students are vulnerable and this impacts on their staying or leaving.

According to Kuh et al, (2005, p. 273) high performing entities displayed distinctive features of “organization’s culture” which was their key to effectiveness. This leads ultimately to the formation of a campus culture which according to Kuh et al, (2005) is important as it helps people communicate in a common language. In conclusion, it seems that good communication between students and staff is important and this interaction will eventually lead to the formation of a culture which can assist in retaining students.

Setting of Goals

One has to consider firstly the original goal of the student for enrolling at the college. The mechanical engineering course for post matric students at the FET on which this study is based has three levels namely N4, N5 and N6. After each level students can exit. Not all mechanical engineering students who enroll at the college will want to complete their studies at the highest FET college level. This then implies that not all students who leave the college at the various levels can be considered as dropouts or failures. This is in line with Tinto’s statement that “In order to discern to what degree individuals see their own leaving as a form of educational failure, one must at the very minimum make reference to the intentions and commitments with which individuals begin their collegiate careers within any population of entering students. Within any population of entering students these will vary greatly” (Tinto, 1987, p. 132). The mechanical engineering course is designed so that the students can exit at any one of the three levels N4, N5, and N6 with a certificate which allows the student to gain sufficient skills to enter the labour market. Therefore if students do not want to progress to the next level but intend from the outset to leave with a certificate then these students cannot be regarded as dropouts. **Leaving with a certificate** maybe addresses the student’s short or medium term goals. These students maybe regarded as “Stopouts” or regarded as “Attrition”.

Another aspect is that many students who arrive at the FET college are uncertain of their careers. This affects student retention as Gordon explains (1987, p. 116) “College

students who enroll with unclear, unrealistic, or uncertain academic and vocational goals have been identified in several attrition studies as a dropout-prone population”. According to Gordon some students change their goals during their college careers as there is a high level of uncertainty. Tinto (1987, p. 85) cites a survey done by Astin, Hemond, and Richardson in 1982 which concluded that “only about one third of students reported that they were sure of their educational and occupational goals.”

According to Tinto (1987, p.41) the higher the level of one’s educational or occupational goals, the greater the likelihood of college completion. Astin (1976, pp. 37-38) confirms the above when he states “The student’s degree aspirations are still related to college persistence and attrition. Students who aspire to a doctorate or professional degree are the least likely to drop out of college, while students who aspire to a bachelors or other degree have the greatest chance of dropping out.”

According to Tinto (1987, p. 44) another important aspect that makes degree completion possible is the level of commitment by the individual. Tinto has identified two forms of commitment that an individual makes, namely goal commitment and institutional commitment. “Goal commitment refers to a person’s commitment to the educational and occupational goals one holds for oneself. It specifies the person’s willingness to work towards attainment of those goals. Institutional commitment refers to the person’s commitment to the institution in which he/she is enrolled”(Tinto, 1987, p.45). Tinto (1987, p. 46) cites Cope and Hannah, (1975, p. 19) who state “personal commitment to either educational or occupational goal is the single most important determinant for persistence in college.” Tinto cites Hackman and Dysinger (1970) who provide a summary of the various levels of competencies and commitments which impact on persistence and these are their conclusions: “(1) Students with high academic competence and moderate to high goal commitment were most likely to persist. (2) Students with high competence but only moderate to low commitment tended to transfer to other colleges or depart and reenroll at a later time. (3) Individuals with low competence but only moderate to high commitment tended to persist in college until forced to leave because of failing grades. (4) Those persons with low competence but only moderate to low

commitment were most likely to depart and not reenroll in any other college at a later date” (Tinto, 1987, p. 47).

Black students and disadvantaged students

“Beginning in the late 1960s American public institutions were forced, mainly through public demand, to address the multifaceted issue of equal opportunity. One tenet of the equality movement was that disadvantaged groups be provided access to higher education” (Valverde, 1987, p. 78). Allowing access did not only take place in America but also in other countries such as Italy and Australia. According to De Francesco and Trivellato, (1977, p. 81) the Italian universities showed a large increase in student enrollments from 1960 to 1975 but made no qualitative changes to accommodate the changed student population who came primarily from the working class and had different expectations. This was one of the reasons for a greater number of students then dropping out. According to Baumgart and Johnstone (1977, p. 555) at Macquarie University (Australia) “the rates have remained fairly constant for each new intake of new students, since the university began classes in 1967, at values approaching 40 percent for undergraduate discontinuation.” What did this result in? Valverde, (1987, p.78) states that the student population changed and consequently institutions increased emphasis on retention through developing new action programmes to meet the changing demands and needs of students so that the institution creates a staying environment for all students.

In the examples mentioned above from different countries, it is observed that when the doors of education are opened then there is a new kind of student entering the institution. Tinto (1987, p. 159) mentions that the student profile has changed from traditional to non traditional but the institutions are still following their traditional values. Tinto (1987) explains further that in earlier years, it was assumed that students entering higher education had to make all the adaptations and if the student could not adjust, and as a result had poor performance then the student was seen to be at fault. Tinto (1987, p. 135) argued that the institution also had to make adjustments to their policies (e.g. education mission, retention policy) to accommodate the different types of students entering the institution. Valverde (1987, p. 83-84) further confirms this by stating “Many low-income

students, particularly those who are also ethnic minorities, find adjustment to be a one-way street: they, not the institutions, must change. This creates a stressful situation that is often detrimental to academic performance.”

According to Tinto (1987, p. 70) who cites Kendrick and Thomas 1970; Shaffer 1973; Sedlacek and Webster 1978; Allen et al 1982; Eddins 1982; Gosman et al. 1983; Donovan 1984, “departure among disadvantaged black students is more a reflection of academic difficulties than it is among white students”. Furthermore, according to Tinto (1987, p. 72), “minority groups especially for those from disadvantaged backgrounds tend to face greater problems in meeting the academic and social demands”.

Townsend was concerned that the black students were encouraged to enroll at institutions but thereafter were forgotten and left to fend for themselves. Dr. Clinita Ford, Director of the National Conference on Retention stated “As a result, black students are still “dropping out like flies” (Townsend, 1994, p. 85). At the same conference Townsend cited Tinto who stated that “much of the problem can be attributed to educational preparation, social background and an atmosphere of racism and discrimination.” Tinto further stated that “universities are coming short on financial aid, fiscal counseling, inadequate mentoring, lack of cultural and social support, a dependence on Eurocentric curricula, faculty indifference, racial hostility and an absence of institutional commitment to pursue black student retention efforts” (Townsend, 1994, p. 85).

How does this compare with South Africa? “The primary aim of the 1953 Bantu Education Act was to limit the tuition of black children to an inferior curriculum sufficient merely to serve the white community” (Morris, 2004, p. 164). This act has resulted in the black South African population who are in the majority being trained in low level skills and characterized by inferior education.

From my experience I am aware that previously FET colleges were built in accordance with the apartheid policy that catered for a certain race group. To compound the problem there were different Departments of Education established with each one having its own

standards. As a consequence of apartheid many of the non whites especially Black Africans were disadvantaged and became the low income group. Currently, at the FET college I have noticed that the scenario is very similar to that described in literature relating to the 60's in America, Italy and Australia when the doors of education were opened. The opening of doors has resulted in a change of the student profile which in South Africa is further compounded with each race group having different levels of academic preparation. In addition, the FET colleges have continued with their old culture although the student profile has changed. Furthermore, the demands made by the mechanical engineering course which is taught in blocks of just ten weeks places too much stress on students, and this stress is felt especially by the black or disadvantaged students.

Financing of students

Almost every day at the FET college on which this study is based, the Student Support Department handles queries regarding student financial assistance. Pascarella and Terenzini (2005, p. 407), emphasize that “Both theory and common sense suggest that economic circumstances play an important role not only in whether and where students go to college but also how long they remain”. Martin (1987) views finances from the administration perspective when he states that college administrators have known that having adequate financial aid resources available is an important factor in attracting and enrolling students.

According to Bean (2005, p. 234) “Running out of money is probably the best excuse for leaving college that there is, because it places the reason for leaving outside the locus of control of the student. Many students who leave college for other reasons blame their departure on money problems.” From my experience at the FET college as well as conversations held with Mlangeni (2008) most students who approach the Student Support Department for financial help has received assistance, where possible, such as the reduction of fees or extra installments. Sometimes students who still cannot afford the college fees are given guidance by the Student Support Department such as applying

for learnerships or skills courses that are sponsored through municipalities or companies or from the Umsombomvu Youth Fund for unemployed youth.

Tinto (1982, p. 689) argued that “the impact of finances occurs at the point of entry into the higher educational system”, saying that this influences the decision of which institution to attend. Furthermore, according to Tinto (1982, p. 690), “Finances have a greater impact upon dropout early in the educational career, when degree completion is distant rather than when completion is only a semester away”. According to Tinto (1982), this is so because the student considers the cost of continuing to attend against benefits to be obtained at the completion of the course. Pascarella and Terenzini (2005, p. 409) confirm Tinto’s statement when they describe the importance of financial aid with the following statistical analysis. The U.S. General Accounting Office (1995), after controlling for students’ academic achievement and other background characteristics, estimated that an additional \$1000 in grant aid to a low-income student reduced the probability of that student’s dropping out in the first year by 23 percent. But the odds were reduced by only 8 percent in the second year, and grants had no apparent effect on low-income students’ persistence in the third year.

Students in the U.S. are financed in many ways, namely through (1) grants (2) parents (fees), (3) student loans, (4) work-study and (5) scholarships. Bean (2005, p. 235) compares the impact of tuition fees and grants on retention and he states “lower tuition fees are preferable to higher tuition fees and grants are preferable to loans. Institutions that provide grants instead of loans will likely retain a higher number of students, particularly African American students who do not like to take out loans”. Bean (2005) also notes that although some institutions have increased their tuition fees the number of student applications has also increased because more expensive institutions are presumed to be of a better quality.

Some students prefer to finance themselves through student loans, but according to Martin (1987) how this impacts upon a student’s persistence is not very clear.

Many students finance their own way through college by working part time which also impacts on persistence. In the United States, according to Pascarella and Terenzini (2005) students can earn income through work-study. This can be in the form of either federal college work-study assistance or institutionally supported on-campus employment. By using this method of financing, students learn and earn at the same time. Pascarella and Terenzini (2005) mention numerous studies that have been carried out since 1991, which find that there is a statistically significant, positive, and frequently unique effect of work-study assistance on persistence and degree completion.

“Institutionally based scholarships have direct positive effects on the College GPA and graduating with honours” (Astin, 1996, p. 368). Many students according to Astin (1996), view the scholarship as receiving aid based on “academic merit.” This according to Astin (1996) acts as a motivator and therefore the student will then try for higher academic achievement.

Martin (1987, p.214) explains that many students who enter college supported by loans and financial aid have had very little experience in managing their finances. Therefore Martin (1987, p. 212) suggests that there should also be a support system in place for effective money management and financial aid counselling. Martin (1987, p. 212) suggests that institutions should establish a caring environment with a more personal touch even with finances. In this way, Martin (1987, p. 212) believes that the student will get the feeling that someone cares and this will result in a sense of belonging that makes the student feel important.

One of the impacts of the inferior education for black Africans in South Africa was that it resulted in an unequal distribution of wealth which made the non whites poor, especially the Black Africans. After the new government came to power in 1994, South Africa adopted the National Qualifications Framework. One of the principles of this framework is access which means “to provide ease of entry to appropriate levels of education and training for all prospective learners in a manner which facilitates progression” (Directorate: Quality Assurance and Development, 2005, p. 9). However, providing

access was not sufficient so the government decided to also provide financial assistance. According to Ishengoma (2002) the South African government established the National Student Financial Aid Scheme (NSFAS) in 1996 to ensure that the academically able students without financial resources can attend higher education. Furthermore, Ishengoma (2002, p. 5) explains that the “NSFAS seeks to impact on South Africa’s racially skewed undergraduate and graduate populations by providing a sustainable financial aid system that enables academically and financially needy students to meet their own and South Africa’s developmental needs.” According to the HESA report (2008, pp. 47-48), in 2006 the amount allocated by the Department of Education to the NSFAS was R625 million which was distributed to 124708 students, in amounts ranging from R2000 to R35000 per student. According to Ishengoma (2002, p. 6) the NSFAS through the Tertiary Fund for South Africa (TEFSA) provides income contingent loans to students enrolled at Higher Education Institutions (HEI). According to the Department of Science, Engineering and Technology one of the main criteria used to qualify for this loan, which is managed by the HEI, is that the total pre tax family income must be less than R100 000 per annum.

Previously, only students from HEIs were eligible for funding from NSFAS. Recently the students from FET colleges have also been included into this financial aid scheme. In a speech, Minister of National Education, Naledi Pandor (2007), mentions “As part of our commitment towards improving access to FET by our youth, in 2007 we launched the Department of Education FET colleges Bursary Scheme. R 600 million was set aside by Treasury over a three-year period”. According to the college report by Mlangeni (6 November 2008) the FET college supported a total of 244 students through the bursary scheme during 2008 which ranged from R2400 to R8700 per student per annum. This bursary covered the student’s tuition fee, accommodation and transport.

Another point regarding need for financial aid is made by Tierney (1999, p. 85) and his colleague, who were conducting research with the main focus being on the Neighbourhood Academic Initiative (NAI). This NAI targeted low income urban minority adolescents in grades 7 to 12 who showed potential to succeed at university.

These students were chosen from the inner cities of Los Angeles, California, public schools. The programme was housed at the University of California and students were selected using two criteria: a) they had to have willingness to learn that was supported by parents, and b) their performance at school had to show an aggregate of “C” and above. The parents, teachers and counselors were constantly involved in supporting and encouraging students through this initiative which also included understanding the local culture and practices as part of the curriculum. Tierney (1999, p. 86) concludes that “The students whom this program serves need not have only economic capital but also cultural capital and cultural integrity in order to reach and succeed in college.”

Classroom environment

The core function of any college or university is teaching and learning and this occurs mainly in a classroom setting which consists of three parts, namely the teacher, the student and the physical resources.

To create the right classroom environment, according to Roueche and Roueche, “The teacher is the key” (1987, p. 283). So what does the teacher have to do? Roueche and Roueche explain that the teacher must create the right classroom environment by employing a variety of teaching and learning strategies, have individual determination to demand more from students, and to make students work hard, but all this should occur within a supportive and caring learning environment.

Kuh et al, (2005) concluded from their research involving DEEP colleges that DEEP Colleges were using a strategy called Active and Collaborative Learning which involved activities such as classroom-based problem solving, peer tutoring, service learning and other community based projects, internships, and involvement in a variety of educationally purposeful activities outside the class. By using these teaching techniques mentioned above, college staff gave the students the opportunity “To practice what they are learning in the classroom, develop leadership skills, and work with people from different backgrounds” (Kuh et al, 2005, p. 69). By doing this Kuh et al (2005) believe that the students were applying their knowledge which allowed them to make meaning of

their learning. Pascarella and Terenzini (2005) also agree with the use of the strategy called Active and Collaborative Learning in the classroom for the teacher to be effective. However, they state that many colleges and universities continue to use lecturing as a means of teaching students. Pascarella and Terenzini, (2005, p. 101) conclude that “Lecturing therefore means generally that the learners become passive which means that the students learn concepts and facts and commit them to memory.” In research cited by Pascarella and Terenzini, Murray and Lang (1997) concluded that student performance was significantly better in topics taught through active participation rather than by lecture.

In addition, Pascarella and Terenzini (2005, p. 101) cite Chickering and Gamson (1987, 1991) who formulated and published principles of good practice in undergraduate education which states “These practices were grounded in research on student development and college teaching and included, amongst others, such things as student involvement in active learning activities, student involvement in cooperative learning activities, faculty and student interaction in and out of class, and prompt feedback to students on performance”.

According to Tinto (2006-2007) many models and theories on retention have been developed over the past fifty years but what is clear is that involvement has become increasingly more important. Tinto (2006-2007) explains that although we now are aware that involvement is the key, the challenge is how to make involvement happens in different settings (non resident institutions) and with different students (commuter students) that will impact on retention and graduation. In addition, Tinto (2006-2007, p. 5) states that “What is now a widely accepted notion that the actions of the faculty, especially in the classroom, are key to institutional efforts to enhance student retention”.

According to Forrest (1987, p. 74), “There is evidence that a relationship exists between instructional style and learning, and persistence rates among students. It also appears that instructional style is related to graduate satisfaction. Students will learn more, and will be more likely to persist to graduation, and graduates will be more satisfied when the

instruction is individualized and develops relevant skills and knowledge” Not only does the teacher have to know and apply the various teaching techniques and strategies to be successful in teaching students, but the teacher needs to understand the students’ background and their different styles of learning. According to Valverde (1987, p. 83) who studied low income students in the United States of America, “Because colleges and universities are predominately white, middle to upper class social systems, low income students come with socioeconomic need dispositions that are different from and generally in contrast to the institution’s expectations of students”. If the teacher is incapable of handling the situation then low income students become high risk and soon they begin to dropout. Valverde (1987, p. 86) suggests that one of the ways of increasing retention of low income students is by the teacher motivating students. Valverde (1987, p. 87) provides a motivation strategy that can be used by the teacher who must assist the low income students by setting realistic achievable goals which will lead to success and this eventually to a positive outlook to learning. In the long term Valverde (1987, p. 88) states that the students will adopt a positive mindset (attitude) to learning and this will lead to persistence at colleges or universities.

Valverde (1987, p. 86) cites a study conducted by, Nisbet, Ruble, and Schurr in 1982 which wanted to accurately profile the learning behaviours of low income students to provide a better fit at various educational situations and delivery systems. In this study they used the Myers-Briggs Type Indicator to determine the learning styles of high risk students at Bell State University. “The researchers discovered that high risk students prefer formalized instruction, teacher-directed lessons, predictable academic routine, group-directed learning goals, and certain types of tests and reading assignments; they also desire immediate closure in teacher announced projects and test dates” Valverde (1987, p. 86). If a FET college lecturer is aware of high risk failure-prone students such as low income students, then the lecturer should adapt his teaching strategy to suit these students. However FET colleges tend to use teaching strategies that have not changed since the days of technical colleges. This was confirmed by the HSRC report (May 2006, p. 115) on FET colleges, where FET college students mentioned that students are

expected to “just read textbooks and learn a bunch of facts without gaining deeper understanding or knowledge of practical applications.”

Beside the student’s background, the teacher in the classroom has to also consider the learning styles of student. “An alternative method of determining learning styles has been developed by Ramirez and Castaneda (1974). Their work in determining the cognitive learning styles of Mexican-American children is based on earlier research conducted by Witkin and others in 1962, which produced the concepts of field dependence and independence” Valverde (1987, p. 87). The researchers described these concepts as “A field independent student prefers independent work, likes to compete and gain individual attention, is task orientated, prefers formal interaction with teachers, prefers learning through the discovery approach and focuses on details of concepts. On the other side, the field dependent student likes to work with and is sensitive to the feelings of others, desires a more personal relationship with teachers, works cooperatively, seeks guidance and demonstration in learning lessons, and focuses on global aspects of curriculum,” Valverde (1987, p. 87). In addition the researchers observed learning styles and classroom environment and concluded that public schools primarily focused on the field independent style for cognitive development while the students from Mexican-American families tended to lean towards field dependence. This means that traditional college teaching methods are in conflict with learning styles of Mexican-American students which places them at a disadvantage. Similarly, in South Africa the FET college students come from a range of different cultures and with different levels of preparation but college continues to adopt the culture of the white dominated technical colleges that preceded them.

Physical resources also play a role in motivating students to learn. Valverde, (1987, p. 86) states that some low income students perform poorly “not due to innate lack of ability but due to inadequately developed skills and low self-concepts resulting from poor school environments.” Valverde (1987, p.86) explains further that if students come from schools that are fairly well physically resourced then they will be able to fit into the colleges and universities fairly easily. If students are not exposed to use of resources at school then

these students are further disadvantaged as they do not understand how to use the resources which may be important to be successful at university or college, e.g. internet and library facilities. In addition, the availability of physical resources can also help the teacher in planning classroom activities that will actively involve students in learning.

Finally, according to Tinto (2006-2007) the classroom is the only place where the faculty and the students meet on a regular basis. This interaction in the class must be of good quality so that it motivates the student to succeed. This implies that all faculty members must be well prepared when going to the classroom and must receive the necessary support from the administration and faculty.

Academically under-prepared students

Being prepared academically for education at college or university is important as it can affect a student's decision of whether to stay or leave. The importance of this factor is mentioned by Bean (2005, p. 224) when he states "In the folklore of retention, academic abilities, usually reflected in grade point average (GPA) or class rank, is second only to money as the most acceptable excuse for leaving college." Many researchers have attempted to research the meaning of being academically prepared by describing the characteristics, understanding the type of intelligences required, and identifying the skills required that prepare students for university or college life.

Firstly, consideration was given to the characteristics of academically underprepared students. Much research was conducted and Moore and Carpenter cite Roueche, 1967, 1972; Roueche and Kirk, 1973; Moore, 1970, 1971, 1976; and Kraetsch, 1980 who define "Academically underprepared students are those students with distinctive characteristics that are perceived by the academic community to place them at a disadvantage in contention with the vast majority of students who enter college with the academic skills necessary for success in college" (1987, p. 96). This created a notion, according to Moore and Carpenter, that academically unprepared students only come from the lower-class and minority students but this not so, instead they come from a diverse population. To substantiate this Moore and Carpenter (1987) cite studies by Cross (1971, 1981) who

describes underprepared students who were not poor achievers in high school, did not score low on standardized tests before they left high school, and were neither culturally nor educationally disadvantaged, did not have psychological problems (low self esteem, low motivation poor self concept) but were upper class students who were academically underprepared. Cross (1971, 1981) goes further by stating that their lack of academic preparation and high dropout rates has not received much attention.

Secondly, besides having the necessary academic abilities such as a high IQ, Bean (2005) alerts us that students entering college require also emotional intelligence and social intelligence. Salovey and Mayer in 1990 introduced the term Emotional Intelligence and define it “as a subset of social intelligence that involves the ability to monitor one’s own and others’ feelings and emotions, to discriminate among them and to use this information to guide one’s thinking and actions” (1990, p. 189). From this definition of emotional intelligence Salovey and Mayer (1990) elaborate further that people with high emotional intelligence display an awareness of people feelings around them as well as their own. In addition these people do not seek mindless pleasure but they also focus their emotions towards growth. Thus, Salovey and Mayer (1990, p. 202) conclude that “emotionally intelligent individuals accurately perceive their emotions and use integrated, sophisticated approaches to regulate them as they proceed toward important goals”. Bean describes what is expected of students when he states that “Emotional intelligence, manifests in the maturity to repress impulsive behaviour and delay gratification, and social intelligence which manifests as the ability to understand what is expected in class and act accordingly, and this will undoubtedly affect a student’s GPA (Grade Point Average)” (Bean, 2005, p. 224).

Thirdly, Moore and Carpenter (1987, p. 98) highlight one of the major problems that affects the retention of students at American colleges, stating “Academic under preparedness among students in the nation’s colleges and universities is widespread and is a major concern”. In addition, Moore and Carpenter cite Wharton (1979, p. 39) who states that “Statistics indicating that 30 to 40 percent of entering freshmen are deficient in college-level reading and writing skills have been used by educators to demonstrate that a

significant number of students come to school academically deficient and that the need for remedial education is pervasive throughout American colleges” (Moore and Carpenter, 1987, pp. 98-99). Graduates in South Africa show the same trend and a research report published by the University of Cape Town, confirms that students directly from schools also perform poorly in Mathematics, Science and communication skills, especially in English (Pauw, et al, 2006, p. 23). This is a major challenge also for FET colleges in that the lecturers in mechanical engineering have to deal with students who are not adequately prepared for the demands of the course. What does this mean? “Many institutions desire to reshape their curricula and design more effective learning activities to help students obtain the knowledge, skills and attitudes necessary for functioning in adult roles after graduation” (Forrest, 1987, p. 62). According to Pauw, et al, (2006, p. 24). the FET colleges are currently changing the curricula to address the poor quality of skills available in the country.

2.2.5. Student Support Department

The Student Support Department is a fairly new concept at FET colleges, introduced in 2003 to help the students cope with college life with a view to make certain that they were successful. Some of the activities are: some academic advising which is done by student liaison officers as well as staff during registration, campuses’ student orientation programmes and during the trimester learning assistance programmes for students who request them.

“Many students use poor advising as an excuse for leaving” (Bean 2005, p. 226). This statement confirms that Student Support Department needs to play an important role in retaining students. In my discussion of Student Support Department I will discuss activities such as academic advising, orientation programs and learning assistance programs.

Academic advising

Crockett (1987, p. 244) states that “Academic advising, effectively delivered, can be a powerful influence on student development and learning and as such, can be a potent

retention force on campus.” Crockett (1987) also mentions the importance college officials attach to academic advising as a retention strategy. Crockett cites a nationwide study that covered 944 American institutions conducted by Beal and Noel in 1980 which examined “the perceived importance of advising” (Crockett 1987, p. 244). From this study, college administrators identified inadequate academic advising as a major characteristic linked to attrition at their institutions.

According to Crockett (1987, p. 246) “O’Banion’s (1972) five step advising model is now generally recognized as the origin of the developmental model of academic advising which recognizes that there is a logical and sequential set of steps to the advising process. The steps are (1) exploration of life goals, (2) exploration of career goals, (3) selection of a major or program of study, (4) selection of courses, and (5) scheduling of courses.” By following this model academic advising will not be a mechanical process whereby academic advisors simply hand out course information but rather will give guidance to the student so that they focus towards a goal or assist students in goal setting which will ultimately lead to a career path. Gordon (1987, p. 133) confirms the importance of academic advising by stating “Academic and career advising services must be comprehensive in nature yet flexible enough to work with individual students who are at various levels of the choice process.”

According to Crockett (1987, p. 246) this has led to many institutions adopting academic advising as it is positively linked to the retention of students. Good academic advising must be carefully developed and planned but most importantly it must be supported by the administrators, well trained academic advisors, and a caring attitude by faculty and staff. Here is an example of student support in action. Townsend states that Grambling University is one of many Historically Black Colleges and Universities (HBCU) which was able to attain the highest retention rate by having a good support system despite having an open admission policy with a large number of students from the low income group. In addition to financial support, students also had counselling support services, tutoring and mentoring. Furthermore, the president Harold Lundy stated “The real key is to convince young people that they have the ability to succeed” (Townsend, 1994, p. 86).

Research conducted by Baumgart and Johnstone (1977) at Macquarie University in Australia where a sample of 444 students was surveyed, confirms that one of the interventions required is procedures to adapt and integrate students socially and academically. For this to occur Baumgart and Johnstone (1977, p. 568) suggest the following procedures “academic advising, provision of student counselling services, the use of small group teaching, programs to assist with reading and writing skills, and programs to assist with library usage.”

In conclusion, Frost (1991, p. 16) states that “developmental advising suggests that students and advisers share responsibility for advising”. According to Frost, this will contribute to the development of students by developing the students’ rational processes, environmental and interpersonal interactions, behavioural awareness, and problem solving, decision-making and evaluation skills.

Learning assistance programmes

Noel (1987) notes that academic unpreparedness, transition and adjustment difficulties, and unrealistic or uninformed expectations are major forces of student attrition. In addition, Gravenberg and Rivers (1987, p. 265), mention that the majority of underprepared students are the first in their families to attend college, and their parents are not in a position to provide assistance to these students. Consequently, underprepared students feel vulnerable upon entering college.

Under-preparedness in students as discussed earlier in this chapter affects retention and therefore it is important that colleges have a structured programme of academic reinforcement to assist underprepared students. Gravenberg and Rivers (1987, p. 264) suggest three kinds of academic reinforcement support efforts: early outreach programs, summer programs, and ancillary instruction. Firstly, the early outreach program is designed to have effective recruitment strategies that assist in identifying potentially needy students as well as the type of assistance they require. Some of the activities include campus visits, workshops, early exposure to college-level instruction, and

assessment of writing, mathematics, and science. Secondly, the summer academic enrichment programme focuses on academic, environmental and cultural experiences so that the students can have insights into the demands of college life. This helps them cope with the demands of college life when they join. Thirdly, according to Gravenberg and Rivers (1987, p. 278) some students are academically under-prepared for some of the courses that demand certain academic competencies in subjects such as Mathematics, Science, and English and therefore they suggest ancillary instruction where the goal is to improve the capacity of existing developmental courses. Students are expected to attend a forty hour mathematics course and then a forty hour science course during a semester. English is taught in an integrated manner during the mathematics and science courses.

“A growing number of faculty members consider teaching of under-prepared students a refreshing and stimulating challenge” say Gravenberg and Rivers (1987, p. 269). Gravenberg and Rivers (1987, p. 269) cite an instructor who notes “ the teaching techniques that are most effective go beyond the subject matter and, in essence, help the students ‘learn how to learn’ ”. To achieve this the teachers are dedicated, use a variety of strategies such as workshops, study techniques, time management, test preparation, tutorial sessions or laboratories emphasizing individualized skills etc. The lecturers at the FET college primarily use extra mural tutorials to help students to learn, for which lecturers are paid extra. To assist students in preparation for the examinations lecturers use past question papers to give guidance to students. The FET college has sent the SLO (student liaison officers) SRC members and some selected staff and students on a study aids course. By including more students on this course the aim was to cascade the information as quickly as possible to the other students through peer teaching.

Escobedo (2007, p. 12) also states that assistance given to students should not be a once off event but rather a continuous programme which should involve a key strategy known as “intrusive advising”. One element of this advising is early identification which should be followed by regular contacts to get to the source of the problem. Other strategies suggested by Escobedo (2007) are classroom presentations, orientation sessions, learning communities and student success classes. Similarly, Seidman (2006, p. 25) suggested a

formula that could be used if programmes are to be successful which is represented as follows ($RET = E_{id} + (E + IN + C)_{iv}$) Retention = E_{id} (early identification) +(early + intensive + continuous) intervention_{iv}. Seidman (2006, pp. 26-31) explains his understanding and meaning of the above formula. Firstly, early identification means that the student profile prior to enrollment is determined, and should, amongst other things, focus on his assessment records, family history, and placement tests. Early identification can also take place after enrollment by lecturers taking note of classroom behaviour as well as performance in the class. Secondly, there should be an intervention strategy which should be early, intensive and continuous. One of the features that Seidman also highlights is that the interventions must be continuous. Seidman (2006, p. 34) states that “For intervention programmes and services to be successful they must be powerful enough to effect change.”

Student orientation

Another activity that is used by many institutions to support students is orientation programmes. According to Titley (1987, p. 222) “Beal and Noel (1980) find orientation to be the third most effective retention activity overall; a number of institutions in their survey rank it as their most effective retention activity when focused on a special target group. Why it is so important is not immediately clear.”

From the definition provided by Dannells and Kuh (1977) orientation involves the following: “(1) Explaining to the students and their parents the general and specific educational requirements for programs offered at their institution; (2) working with students on how to get the most out of the programs offered to fit their personal needs; (3) helping students to examine their interests, abilities values, and limitations; (4) encouraging faculty and students to establish good working relationships; and (5) dealing with the myriad other intellectual, cultural, psychological, physical, social, and spiritual adjustments of the freshman year.” (Titley, 1987, pp. 223-224)

Titley (1987) mentions that there is very little research literature regarding orientation time format and its effectiveness. Braxton and Lee (2005, p. 123) support the idea that

“the orientation program for first year students should continue throughout the year as it provides opportunities for social interaction among students.”

Finally, Seidman (2006, p. 52) states “Do not recruit students to your campus who will not be successful unless you are willing to provide programs and services to overcome deficiencies. Philosophy does not have to follow finance. Finance should follow philosophy”.

2.2.6. Conclusion

From all the research conducted in student retention, the most important aspect is to try and focus the student on the goal that the student wants to attain. For the student to attain the desired goal a good support system is required to make certain that the correct goal is chosen. The support system must be accessible to the student and can be formal or informal.

From the formal structure perspective, the college or university can provide support by having academic advising, career guidance, parents meetings, orientation programmes, financial aid, faculty involvement and learning assist programmes.

From the informal perspective, support can be in the form of parent’s expectations (family), peer support, and community support. For informal support to be effective there has to be good communication, but more importantly the correct information needs to be disseminated. As mentioned earlier anthropological studies, especially of the Aruntas and Hutterites, confirm that if the students understand the goals that must be attained and know the support structures in the community then there will be no dropouts. In another scenario concerning Central American refugees, Suarez-Orozco (1989) points out that immigrants who do not drop out have a strong sense of goals that are to be achieved and therefore they will persist despite all the obstacles that they face in foreign countries. Tierney (1999) during his NAI research also shows that community support can play a vital role in motivating students to continue to study and perform well.

If both the informal and formal structures assist the student in attaining the same goal then there will be less confusion and the student will become focused which will lead to persistence.

Finally, working towards retention of students does not belong to a single department like Student Support Department but it is the responsibility of every person inside and outside the college.

Chapter 3 Research Methodology

3.1. Introduction

I conducted my research in the interpretivist paradigm which tries to understand people's beliefs, culture and values. There are many research methods that can be used but I chose three methods namely documentary analysis, survey (by questionnaire), and focus groups. My intention was to use these three methods so as to gather data that gave me firstly a broad overview and secondly an in-depth understanding of student retention and dropout. I used documentary analysis and the survey to help me to obtain a broad overview, while the focus group interviews with the students and lecturers allowed me to probe their inner feelings, beliefs, culture and values. The documentary analysis helped me gain insight into the trends regarding dropout or retention in mechanical engineering. Although the results are quantitative it was the first step identified by me to understand the situation at the FET college regarding dropout and retention of mechanical engineering students. The focus group was where that I could get information about the inner feelings and beliefs of students and staff members.

3.2 Documentary analysis.

Schuh and Upcraft state "Documents can provide a rich source of information in the development of a qualitative study" (2001, p. 34).

According to Schuh and Upcraft (2001, p. 34), for effective documentary analysis, documents should be readily available, and sources of the data need to be stable. The FET college uses the Coltech system which captures the student's personal details during registration. This system was used to generate reports that I analyzed from 2005 to 2007 to obtain an overview of students who enrolled for mechanical engineering. The information gathered is quantitative. The Coltech system has been designed for FET Colleges and has been used by most FET colleges for many years. There is also an electronic backup system for the Coltech system as well as paper copies of student enrollments that are kept at each campus site. The data on the Coltech system can be changed but all changes are tracked. In addition only certain managers have access to

Coltech as it requires access by password which is also monitored. From the security measures taken above to capture and storage of enrollment data as well as the availability of this information, it can be assumed that the criteria of as stability and accessibility are met.

On the other hand, according to Schuh and Upcraft (2001), documents may also have weaknesses, namely, (1) they may be incomplete, (2) they may reflect the author's bias, and (3) they may be nonreactive (which means the researcher has to ask questions about the documents). In my study I used documentary analysis as a starting point to gather information to help me to understand the retention or dropout of mechanical engineering students from a historical perspective. This data is quantitative and I used the enrollments figures from 2005 to 2007 for mechanical engineering for levels N4, N5 and N6. This data only indicates numbers of students enrolled, which is very limited and did not answer my research questions. To overcome this I used two other techniques, firstly, a survey of 2007 students including dropouts and secondly two focus groups, one with students and the other with mechanical engineering lecturers to help me understand students' real reasons for leaving. The historical data has been analyzed in a table format (see Tables1 and 2) so that it is easy to read and interpret the retention and dropout trends in mechanical engineering.

3.3 Survey

I surveyed 52 students by questionnaire to gather more information about the students' view regarding the mechanical engineering course. The groups that were selected for the survey were the students in the N4, N5 and N6 mechanical engineering in 2007 on two campuses. There was a maximum of 30 students in each group. I did not choose a sample but asked all mechanical engineering students on all the levels who were present to answer the survey questionnaire. After seeking permission from the campus manager I went to the classroom to administer the survey questionnaire. Initially I explained to the students the purpose of the survey and assured the students that the results of the survey would be confidential and that there would be no negative consequences should they reveal sensitive information. To further assure the students I asked them not to write their

names on their questionnaires. I felt that by administering the questionnaire myself, I was available to give points of clarity when necessary.

Contacting students who dropped out was a challenge. Using the Coltech system I was able to obtain the student contact details including telephone numbers. I telephonically contacted these students or their parents to inform them of the purpose of my study and requested that they assist me by completing the survey questionnaire. One of the problems I encountered was that some of their telephone numbers did not exist or were incorrect. Another problem was that some students used their parents' contact details and it was difficult to explain to the parents (many of whom did not understand English and were not familiar with research) the purpose of the research. Language also became an issue as many of the students who dropped out used English as a second language and initially could not understand what I was requesting. After some persuasion and clarifying they agreed to complete the questionnaire. Another reason for telephoning first was to give me the opportunity to confirm the mailing address of the student. Thereafter the questionnaire (see annexure 9.1) together with a letter (see annexure 9.4) was posted to the student. A postage paid envelope was included with the reply address printed on it. In this way the student did not have to incur any cost, and could not post the reply to the wrong address. The college postage system was used to save costs. If I did not receive a reply from students after two weeks then I telephoned to remind them about the questionnaire. In some cases the questionnaire was misplaced and another questionnaire was mailed to them. After three months I accepted that I was not going to get any more responses. I also expected that the response rate from mailed questionnaires was not going to be high. This is normal; Gorard states that "the average response rate to postal surveys is low, about 20 per cent". (2001, p. 84). I mailed twenty five questionnaires and received only eight replies which represent a 32 per cent response rate.

Moore (2000, p. 83) states "Telephone surveys are among the primary tools for data collection procedures in student affairs assessment". I also tried to conduct the survey over the telephone whereby I read the questions and the various choices and recorded the student's responses. I had many problems with using the telephone survey and here are

some of the reasons. Firstly, most of the students at the FET college use English as a second language, and they had difficulty understanding the questions. Secondly, the questions were relatively complex. As Moore (2000) states, the questions should have limited complexity. My survey questions were unsuitable for a telephone interview as there were too many choices, which took too long to read over the telephone. Moore (2000) suggests it is difficult to ask participants to rank more than three choices. Thirdly, control over the student during the telephone interview was limited in that I did not know if the student was listening to me or just trying to get done as quickly as possible. Consequently this impacted on the credibility of the data gathered by telephone. Fourthly, the interview was too long and in some instances lasted for more than forty five minutes which impacted on the telephone cost although I called the student in the evenings when the telephone costs are lower. Lastly, Moore (2000) states that open ended questions are unsuitable for telephone surveys. In my questionnaire each question allowed for the student to comment, which the students I spoke to did not want to do. Consequently, I abandoned the telephone survey after conducting 2 fairly successful interviews. Altogether I gathered information from a total of ten students who dropped out (from 8 questionnaires returned by post and 2 successful interviews by telephone) this represent a forty per cent return rate of dropped out students who were given the questionnaire.

Design of the survey questionnaire

A researcher's task is to find out something that is not easily observed and therefore one way of finding out is to ask questions. Fowler (1995) explains that asking questions will invoke answers from the respondents but not all respondents will answer in the same way as they will interpret the question in different ways depending upon their language, culture and understandings. Fowler, (1995 pp. 2-4) states that this dilemma for the researcher can be minimized by making the questions have the following characteristics:

Firstly, a good question is one that all people answering it should understand in a consistent way and in a way that is consistent with what the researcher expected it to mean.

Secondly, a good question must be able to be administered in a consistent way. If questions are in writing then all respondents must be able to read. If the question is to be administered by an interviewer then the standard is that the interviewers can and will read the question the way it is written.

Thirdly, a good question consistently communicates to all respondents the kind of answers that are wanted and are acceptable.

Fourthly, all respondents should have access to the information needed to answer the questions correctly (Unless you are measuring knowledge).

Finally, questions should be asked to which respondents are willing to give the correct or valid answers.

The survey questionnaire was designed with careful consideration being given to language. Over the many years of interaction with mechanical engineering students at the FET College I know that many of these students use English as a second language, and they do not like to write. According to the lecture notes provided by University of KwaZulu-Natal my questions had to be simple, direct and easy to read. Therefore students were given many options that required them to simply tick their choice or choices. This has helped me as to analyze the data quickly without having to decipher the student's handwriting or try to understand what the student meant. The questions could then be classified as close ended. However, at the end of each question students were given the opportunity to comment. This then made each question open ended. In this way the students were able to explain their points of view. One of the weaknesses of having so many open ended questions is that it was difficult to analyze these comments and in some cases it was difficult to make sense of what the student was trying to say. Another weakness of the survey questionnaire was that the students could not communicate their in-depth opinions, feelings and emotions easily. To overcome this weakness I used focus group interviews with both students and lecturers.

Each question from the survey questionnaire was analyzed. In addition these figures are represented graphically in the findings chapter. This makes for easy reading and interpretation. The Likert scale was also used in question number 10 where students were requested to rate the lecturers. Also students were requested to give a reason for their choice. According to Alreck and Settle (1995, p. 117) the advantage of using the Likert scale is its flexibility, economy and ease of composition. The data can be easily coded and manipulated.

According to Gorard, the questionnaire is the most abused method which he terms “the quick fix of social research methods” (2001, p. 80). He also adds that the survey is always used by novice researchers. This prompted me to also gather information through focus groups.

3.4 Focus Groups

The focus group discussions gave me the opportunity to gather information in depth as well as to explore the staff and students’ beliefs, which was in keeping with my paradigm. Litoselliti cites Krueger who states “Focus groups are intended for gaining information and listening to people’s views in a non-threatening environment” (Litoselliti, 2003, p. 9). Hence I had two separate focus group discussions, one for the lecturers and the other for students. The reason for holding separate group discussions was to allow the students the freedom to make comments without feeling intimidated by their lecturers.

Before commencing with the focus group discussions I addressed the participants. Firstly I had to guarantee that the information provided was confidential and that there would be no negative consequences for them no matter what they told me. Thereafter I also explained the nature of my research the expectations which Litoselliti (2003, p. 16) summarizes as “Focus group research is useful for revealing through interaction the beliefs, attitudes, experiences and feelings of participants”. I also explained the purpose of recording the discussions as I was going transcribe them later. At the student focus

group I also introduced an interpreter who was there to provide assistance to students in IsiZulu. The students indicated that they were competent to speak in English.

According to Merton, Fiske, & Kendall (1990, p. 3) a focus group has the following distinguishing characteristics: Firstly, the group of persons interviewed will have been involved in the particular situation. In my research I focused on mechanical engineering staff members and students who attended the mechanical engineering course at the FET college. “Projects in the social sciences typically involve full focus groups comprising between six to ten people” (Litoselliti, 2003, p. 6). In the lecturers’ focus group there were seven staff members while in the students’ focus group there were eight students. The student focus group was comprised of one male student who dropped out from the N5 level, 3 females and 4 males currently studying mechanical engineering. The lecturers who taught N4-N6 mechanical engineering from both campuses were chosen. The lecturers’ focus group consisted of 1 female lecturer, 3 white male lecturers, 2 male black lecturers and 1 Asian lecturer. I used seven staff members and eight students as it was easy to manage a smaller group during the interview and easy to convene. Separate discussion questionnaires with similar questions were used for lecturers (see Annexure 9.3) and students (see Annexure 9.2) to collect data. To give me flexibility I decided to use a semi structured format when I conducted the discussion as this allowed me to probe into issues that came up during the discussions. According to Krueger (2002, p.6) “Questions in focus group should be open-ended”. All my questions were designed to stimulate discussion. When I was interviewing the students they seemed to be reserved. This allowed me to use the prompt questions that were also prepared to stimulate discussion. Krueger (2002) suggested that questions that have a ‘yes’ or ‘no’ answer is not effective for a focus group discussion. Also I was mindful in the student focus group to keep my language as simple as possible as I was aware that many of the students used English as a second language. Some issues stimulated good discussion in the lecturer’s focus group.

Litoselliti cites Krueger (1994), Morgan (1988, 1993) and Gibbs (1997) who mention potential limitations of focus group discussions (Litoselliti, 2003, p. 20). Some of the

difficulties that I experienced during the focus group discussions were: Firstly, sometimes the participants were speaking all at once and this turned out to be noisy and inaudible on the recording. In the students' discussion I was forced to repeat what they had said and in this way I confirmed with the students that I had the correct meaning. Secondly, some students were talking too softly as though they were not confident. The quality of the tape recording was also affected by students outside the classroom screaming for their other colleagues to come to the interview room despite me having all the windows and doors closed. The confidentiality of the participants was not breached as the students outside could not hear them. To try and eliminate this problem I tried to confirm the information by repeating the student's comments. The noise also was disturbing the trend of questioning as I had to indicate that they should be silent. This hampered the quality of the discussion and affected my style of questioning. Thirdly, some participating students tended to remain silent while other students took part in the discussions. This was overcome by me by also trying to get these students involved in the discussion or to comment. Fourthly, I had difficulty in transcribing the recording as it was difficult to listen to what the participants were saying when all of them were speaking at once. This could have resulted in me missing out on some important information which could affect the quality of the data gathered.

The lecturers' focus discussion was a much better discussion as staff members participated fully.

As my research was conducted in the interpretivist paradigm where peoples feelings, culture and beliefs are important, I used focus group discussions which I tape recorded. These tape recordings were then transcribed. The transcripts from the both focus group discussions were analyzed according to themes which were based on words and phrases that were used repeatedly during the two focus group discussions. I coded each theme from both focus groups and matched them. These matched themes were aligned to my key research questions, and were related to motivation, and the various factors affecting student retention and student support. These were the broad themes which I also analyzed further into sub themes where necessary.

3.5 Limitations of this research

Firstly, I have to acknowledge that after spending twenty years at the FET College I may have become very involved in the institution and therefore my research findings may not be totally free of bias.

Secondly, my position at the college may have caused staff and students not to be open with me as they may believe I may not keep to my word as I often interact with the management of the college. Consequently the findings may not reflect the staff and students' honest opinions.

Thirdly, I am aware that black African students who are the majority of students at the college often have an imperfect understanding of English. Hence some of the views expressed by them may not be as they may have intended. Also, some of these students may have not understood the questions well.

Fourthly, students may have not taken my research seriously and may have answered questions in an insincere manner.

Fifthly, trying to find the dropouts from the college was the most challenging task as information the students provided to the college was incorrect in some cases.

Sixthly, I may have been racially biased to other race groups as a result of my apartheid background and I may have some preconceived notions that may have affected my thinking and research findings.

3.6 Conclusion

To gather information is easy but the researcher must always bear in mind that the information must be valid and reliable. I acknowledge that my position at the FET college as a manager may have influenced the answers the students and the lecturers presented to me, and therefore I think there may be an element of bias in my research.

Given the above I have used three research methodologies so that I could limit the bias and thereby achieve greater validity and reliability of the data gathered.

Chapter 4 Findings

4.1. Introduction

To answer the three questions in my research design I chose three ways to obtain information namely documentary analysis, a student survey and focus group discussions. Figures give the historical trends but do not provide the reasons that cause the mechanical engineering students to leave early. To discover these reasons I used a written questionnaire which was completed by fifty two students. In addition, I ran two focus groups to gain some in-depth knowledge of the possible reasons, beliefs and understandings for student drop outs in mechanical engineering.

4.2. Documentary Analysis

The documentary analysis provided me with the understanding of the student retention problem in mechanical engineering at a FET college. Data regarding student enrollments were gathered from documents such as class registers and enrollment forms which were verified against the FET college's electronic Coltech system. Thereafter the enrollments were analyzed (See Table 1) to establish a trend for each group of enrolled students. To understand the trends presented in Table 1 it is important to know how the enrollment of students at the FET college in mechanical engineering is conducted. Firstly, the mechanical engineering course at the FET college has a duration of ten weeks and this allows the college to have a maximum of three enrollments per year. Each period of ten weeks is called a trimester. This enables a student to complete the three levels N4, N5 and N6 in one year. Secondly, the FET college students can commence with their studies at the N4 level in the second or third trimesters and therefore there can be three intakes of students in one year which is indicated in Table 1 below. To make the understanding of the trends clearer, in Table 1, I have tracked each group of student enrollments over three consecutive trimesters and calculated their percentage change from N4 to N5 and thereafter from N5 to N6. To make reading easy, I have tracked the student enrollments for each group from the first intake in 2005 to the last intake in 2007, by using different colours. Table 1 below shows the trend in student retention.

Table 1 Full time trends in enrollment

Trends showing full time Mechanical engineering Students Retention- First intake in Trimester 1											
	2005			2006			2007			2008	
Levels	N4	N5	N6	N4	N5	N6	N4	N5	N6	N4	
Student enrollments	31	11	0	29	9	0	31	16	18		
Percentage drop		64.52	100.00		68.97	100.00		48.39	-12.50		
Trends showing full time Mechanical engineering Students Retention -Second intake in Trimester 2											
Levels		N4	N5	N6	N4	N5	N6	N4	N5	N6	
Student enrollments		15	8	0	28	9	0	29	20	0	
Percentage drop			46.67	100.00		67.86	100.00		31.03	100.00	
Trends showing full time Mechanical engineering Students Retention - Third intake in Trimester 3											
Levels			N4	N5	N6	N4	N5	N6	N4	N5	N6
Student enrollments			12	0	0	20	10	0	52	21	0
Percentage drop				100.00	100.00		50.00	100.00		59.62	100.00

In Table 1, I have tracked each group of students from the entry level (N4) to completion (N6). For example, the first enrollment for 2005 (in black) shows 31 students in N4, from which only 11 progressed to N5 and no student enrolled for N6. In the same year there was a second new enrollment of 15 students at N4 (in green), from which only 8 students progressed to N5 and again no students enrolled for the N6 class. The third and last new enrollment for 2005 shows 12 students in the N4 group (in pink) from which no students progressed to the higher levels namely N5 or N6. In the same way the process was repeated in 2006 and 2007. In 2006 the first enrollment commences with 29 students at the N4 level (in red) while in 2007 the N4 begins with 31 students (in purple).

From Table 1 it is clearly evident that the FET college has a problem regarding the retention of students in mechanical engineering. The above analysis also shows that regardless of the time of the year the first intake occurs, the percentage drop-out from one level to the next remains high. In the third trimester for 2007 the figures show an improved retention rate but this was due to the teachers' strike that affected examinations. Because of the strike students were given concessions to enroll on the next level as the processing of examination results was delayed. Because of these concessions, for the first time many students progressed to the next level which resulted in a full time N6 mechanical engineering class. In Table 1 the drop-out percentage is indicated as -12.50% which means there was an increase in student numbers and this may have been as a result

of a few students who previously passed from different N5 groups who were waiting to join any N6 mechanical engineering class as soon as it was offered.

After understanding the general trend, the data above was analyzed further to show the average retention of students for the different levels over three years as shown in Table 2 below. For consistency, the same colours were used to match the groups tracked from Table 1.

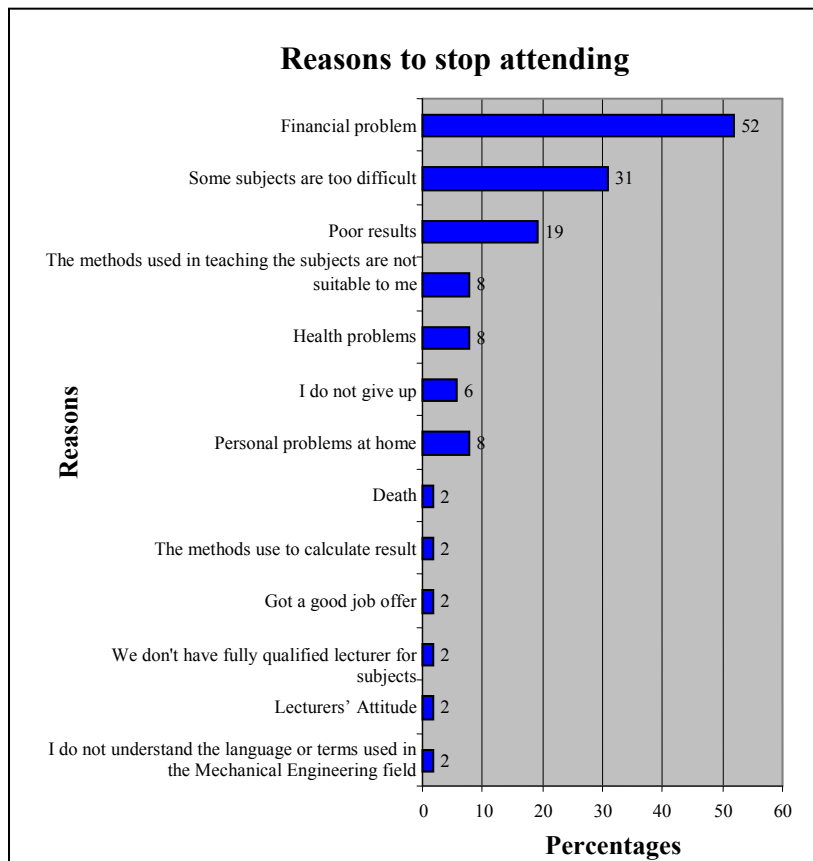
Table 2 Calculation of overall average drop out

Percentage Drop out per level							Three years Overall Average	Three years Overall Average
Levels	N4-N5	N5-N6	N4-N5	N5-N6	N4-N5	N5-N6	N4-N5	N5-N6
Year	2005/2006		2006/2007		2007/2008			
1st intake	64.52	100.00	68.97	100.00	48.39	-12.50		
2nd intake	46.67	100.00	67.86	100.00	31.03	100.00		
3rd intake	100.00	100.00	50.00	100.00	59.62	100.00		
Average drop N4-N5	70.39		62.27		46.35		59.67	
Average drop N5-N6		100.00		100.00		62.50		87.50

In Table 2 the average drop out rate was calculated from N4 to N5 for each group starting from 2005/2006 (70.39%), 2006/2007 (62.27%), and 2007/2008 (46.35%) which was used in turn to calculate the overall three year average of 59.67%. Similarly, the average drop out rate from N5 to N6 was calculated for same three years as 87.50%. By simply looking at these figures (besides year 2007) one may tend to categorize these students as dropouts but, as noted in the literature review, Tinto states “defining dropout appropriately is no simple matter” (1987, p. 131). There are a number of reasons for students not to complete the mechanical engineering course. Firstly, for each level completed, students obtain a national certificate which allows them to exit. Secondly, as Astin makes us aware, students “have their own goals and plans” (1976, p. 6) like transferring to other institutions, as was expressed in student focus group discussions where the students stated: “*As for me I want to go to DUT*”, or joining the labour market

as confirmed when students mention “*I think the other reason is because there are jobs already where maybe if you got N3, N4 you see.*” Thirdly, another concept, as described by Astin (1976, p. 9) that needs to be considered when students leave prior to N6 is “stopouts”. This term describes students who make an early exit but re-enroll at a later stage to continue with their studies. Fourthly, Figure 1 below shows the results from the student survey indicating a variety of other reasons (ranked in descending order) for students who leave before completing their studies.

Figure 1



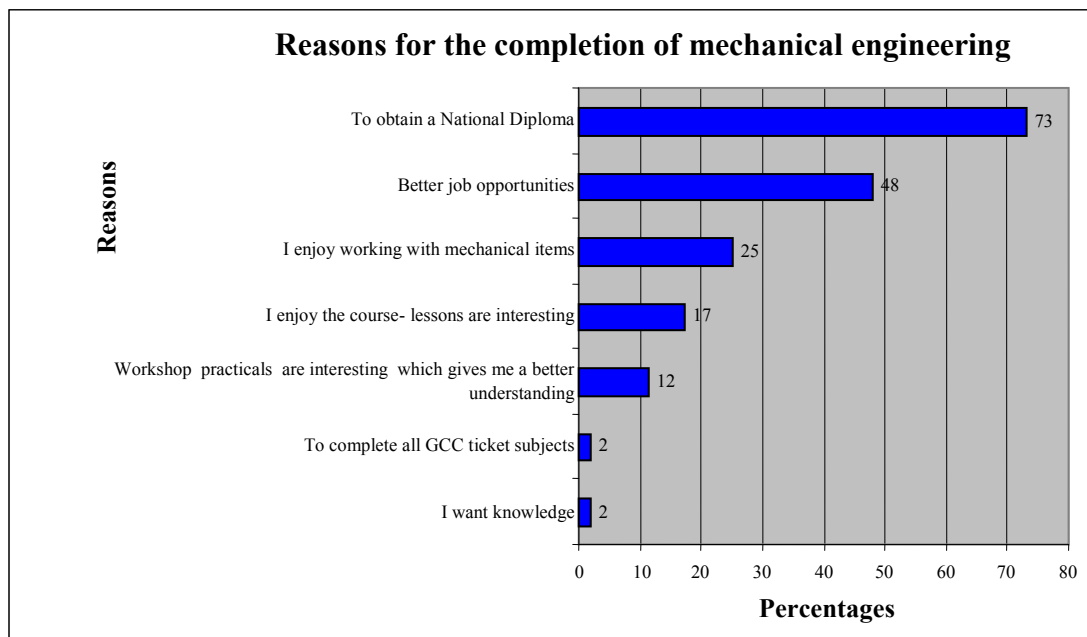
The results of the student survey (Figure 1) show that the first three reasons students gave for leaving are finances (52%), difficulty of subjects (31%), and poor results (19%). Less common reasons relating to lecturers included unsuitable teaching methods (8%), lack of fully qualified lecturers (2%), and lecturers’ attitude (2%). Language also plays an important role in teaching and 2% of the students indicated that poor understanding of language could cause them to leave as they did not understand the concepts used. Some students (2%) indicated that they had got good job offers which encouraged them to stop

studying and start earning. Other reasons such as health problems (8%), personal problems (8%) and death (2%) could also cause students to leave early. Some students stated that “*I will not give up*” (6%). This means that these students intend to continue to study despite the challenges that they face. This group of students is known to student retention researchers as persisters. Tinto cites Hackman and Dysinger (1970) who provide a summary of the various levels of competencies and commitments that these students could have which also impact on the type of persistence adopted and these are their conclusions: “(1) Students with high academic competence and moderate to high goal commitment were most likely to persist. (2) Students with high competence but only moderate to low commitment tended to transfer to other colleges or depart and reenroll at a later time. (3) Individuals with low competence but only moderate to high commitment tended to persist in college until they are forced to leave because of failing grades.(Tinto, 1987, p. 47).

Based on the assumption that obtaining a diploma (73% from the student survey - see Figure 2 below) was the students’ original goal for studying mechanical engineering I have categorized these students who did not complete the course as dropouts despite the difficulties in defining them as dropouts. This categorization is reasonable since in both the focus group discussions with students and lecturers they indicated that most students strive to obtain a diploma in mechanical engineering. Hence, I can conclude that the dropout for this course is unacceptably high. This trend is not unique to the FET College but is similar to other international educational institutions. Tinto confirms this when, with reference to the United States, he states “The typical four year-college can expect a total rate of institutional departure to be roughly 56 percent of an entering cohort” (1987, p. 15). In comparison, the average dropout for the FET college is 59.67% (Table 2). It should be noted that the average dropout of 59.67% was artificially low because concessions were granted to students as a result of the teachers strike. In 2004 when there was no teachers strike there were no students enrolled for the N6 level. If 2004 figures were to be considered in the calculation of the average dropout rate over a three year period then the result would have been 100%. In his article Tinto (2006-2007, p. 2) writes “Though some institutions have been able to make substantial improvements in the

rate at which their students graduate, many have not”. From the same article he also cites from the NCES report (2005a) from the United States which states “Indeed the national rate of student persistence and graduation has shown disappointingly little change over the years” (Tinto 2006-2007, p. 2). From the documentary analysis it is clear that very little has changed over the last three years at the FET college concerning mechanical engineering. This means that there is a similar trend regarding the dropout of the FET College mechanical engineering students where there are no students enrolling for the N6 level.

Figure 2

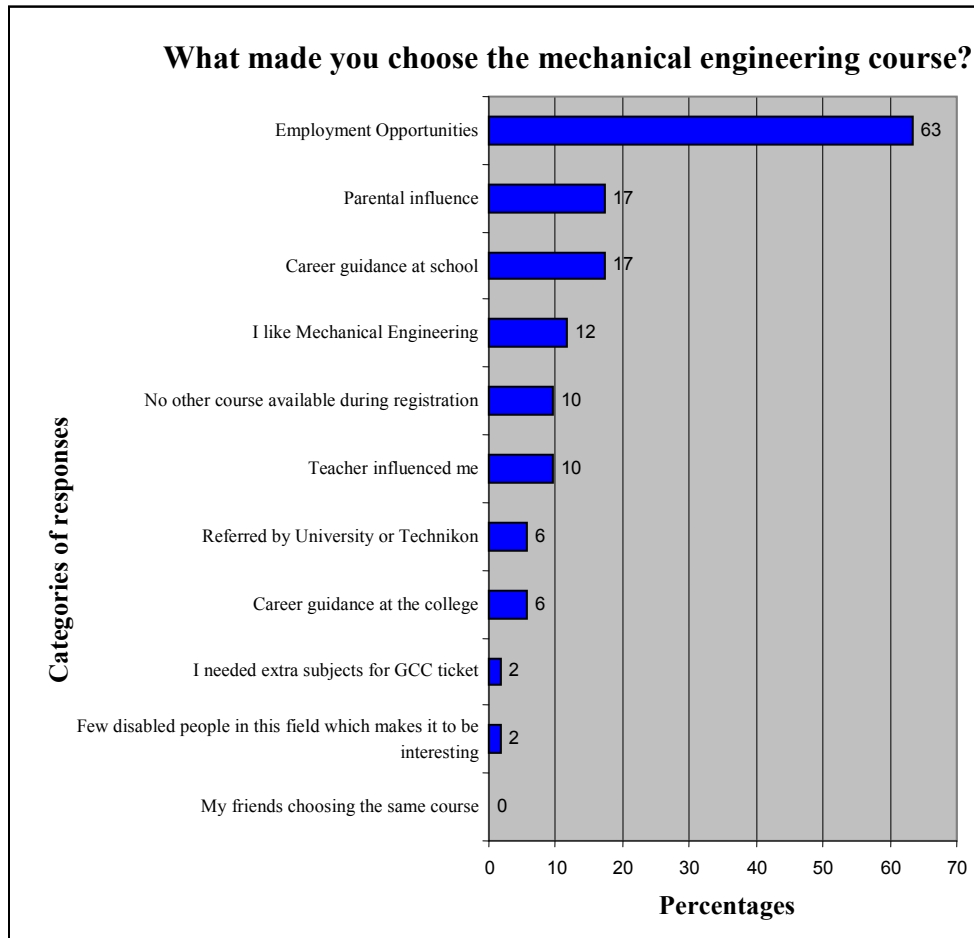


4.3. Motivation for choosing mechanical engineering

When students want to study mechanical engineering there has to be a reason and this can be considered as the motivating factor which can influence the student to stay or leave. Therefore in my study I have selected motivation as one of the concepts that helped in understanding the student retention issue. In gathering evidence the first question posed in the written questionnaire as well as the focus group discussions was related to the reasons for choosing mechanical engineering.

The results of the student survey (ranked from highest to lowest in Figure 3 below) show a range of reasons for students to study mechanical engineering.

Figure 3



One of the constructs, from The Expectancy for Success Construct Model, which was discussed in the literature review, is the concept of task value which seeks to answer the question “Why am I choosing to study the mechanical engineering course?” From the data shown above it is evident that employment opportunities are the dominant reason (see Figure 3, 63%) for students choosing mechanical engineering. The students’ focus group discussions confirm this when they stated the following:

“I want to become my own boss in the end.”

“Then after the diplomas it eh it eh become very easy to find jobs having a diploma.”

“I want to get a job.”

A response from the lecturers’ focus group discussion confirms that employment also motivates:

Resp 2 *“There has been a lot more advertisements um advertising for students and they seem to be bringing in. So I see the students getting motivated to complete their studies in order for eh employment. So, that I think that a big factor that they need... they need to know that there is employment available to them or for them and then...then that motivates.”*

The Expectancy for Success Construct Model also considers a person’s self concept which is influenced by other variables such as external factors that include culture, interaction with parents, peers and teachers as well as the student’s past performances and achievements. The results of the student survey (see Figure 3) supports this model by showing that 17% of the students are motivated by their parents and 10% by teachers. Furthermore, support from the lecturers’ focus group discussion regarding parents is as follows:

“Resp 4 *Maybe because of family pressure. You may find parents are fitters or turners or (Resp 5 Yeah) boiler makers and they follow in the same footsteps. Choose the same trade.”*

Besides the influence of teachers and parents, counsellors also play an important role in motivating students. Figure 3 shows 17% were referred by school counsellors, 6% referred by university and technikon counsellors and 6% were referred by college career guidance. Tierney (1999) through his research which was called the Neighbourhood Academic Initiative (NAI) (see literature review) shows the need for counsellors, teachers and parents to support students. In his research Tierney (1999, p. 86) brought about interaction between the school and the community by getting the NAI staff to host seminars and community meetings that showed teachers and counsellors how to get to know and support the families of their students and, in turn, show families how to get to know and support teachers and counsellors. Tierney (1999) argues that interacting with

the students, parents and counsellors was insufficient for motivating students. He wanted to also include culture which according to The Expectancy for Success Construct Model and Tierney (1999), plays an important role in motivation. Tierney's (1999) programme was structured to include culture by the introduction of the family and from his research he concluded "The program's family involvement component also supports and affirms the cultural backgrounds of NAI students" (1999, p. 86). In an attempt to get parents involved in their children's education at the FET college parents' meetings are organized at least once every 3 months. The FET college uses these meetings to share information with parents regarding the FET college as well as to encourage interaction between lecturers and parents. Another way the FET college encourages interaction, is through the Student Support Department which was established in 2003 with student liaison officers (SLO) who form links between students, lecturers, industry and parents.

One of the options that was not chosen by the students as significant was the influence by their friends (0% - see Figure 3). This is only factor that is not in line with The Expectancy for Success Construct Model and Astin's research regarding peer influence. Astin's research showed the importance of the peer group and he concluded that "the student's peer group is the single most potent source of influence on growth and development during the undergraduate years" (Astin, 1996, p. 398). This means that if mechanical engineering students are not influenced by their peer groups then this according to Astin can have a significant effect on their dropout or retention

Intrinsic motivation also plays a role in students choosing to study mechanical engineering. From this statement as shown in Figure 3, 12% of students indicate that they like mechanical engineering. Together with intrinsic motivation students need to have goals that show achievement but these goals must be realistic which McClelland (2007, p. 1) describes as the need for achievement. A good example of a realistic and challenging goal is mentioned by 2% of the students who are focused on obtaining the Government Competency Certificate (GCC). From Figure 3, students (2%) state "Few disabled people in this field which makes it to be interesting." Having disabled persons seems interesting and being intrinsically motivated is important but McClelland (2007)

reminds us that students' goals must be realistic especially in mechanical engineering. If the job demands for mechanical engineering are to be considered then it implies that because of the tasks in the job, strong able persons are required. Depending upon the nature of the disability this could be a very challenging or frustrating job for the disabled student. Further examples of intrinsic motivation were mentioned in students' focus group discussion where they stated:

Resp 5 *"It was my aim to do mechanical engineering because I like it."*

Resp 7 *"Oh. I love mechanical engineering because it has a lot of challenge."*

Resp 8 *"I just find eh mechanical engineering interesting. That why I do it."*

Another aspect of The Expectancy for Success Construct Model is the students' expectancy. Expectancy, as Pintrich and Schunk (1996) explain, refers to the actual beliefs that the student has about his/her future expectancy for success. Many students expect that they see mechanical engineering as an easy course which can be easily translated into a national diploma issued by the National Department of Education. This diploma requires the learner to provide evidence of a minimum of at least two years of relevant practical experience in the workplace in mechanical engineering. The different perspectives presented by lecturers and students regarding the purpose of the mechanical engineering course highlights different expectancies. Here are statements from the lecturers' focus group discussion in which they mention their views of some of their student's expectancies:

Resp 1 *I think some of them have got a vision of being designers one day, but the problem is during the course of the trimester some students drop out.*

Resp 2 *"I also find that students are enrolling under the wrong impression. They think that they going to become engineers as opposed to becoming a trade - doing a trade- becoming an artisan. So they are coming here expecting now they becoming an engineer*

and find that it is not as simple or easy they thought it would be and they also have the wrong impression.”

Resp2 *and what else I think with students they come to us with the wrong idea.*

In the students' focus group their expectancies are

Resp 1 *“Because I didn't like them saying when they said that we are gonna be assistants. Ah no.”*

Resp2 *“Well eh to be a mechanical engineer.”*

In analyzing the above two perspectives, the lecturers state that they are aware that students have the wrong idea, which is that they are becoming mechanical engineers. This is confirmed when students state that they believe that they are becoming mechanical engineers and not assistants. A possible reason for this difference in perspectives is due to the low percentage of students who use college guidance when registering for mechanical engineering course (see Figure 3 – College guidance 6%). If the students receive correct guidance then the students are not misled by the title “mechanical engineering”, but have realistic expectations of the course. Since the students have not received correct guidance there is a greater likelihood the dropout/retention of students being affected. Students have the perception that they are going to be mechanical engineers but FET college course is designed for students to initially graduate as mechanical engineering artisans who will be assistants to professional mechanical engineers.

4.4. Factors affecting Student Retention

Academic and social system interaction

As the literature interview indicates academic and social system interaction is important for student retention and this can be formal and informal. From both discussion groups the interaction between the lecturers and students is primarily on a formal basis and this occurs mainly in the classroom. Peer interaction occurs primarily in the formal

environment which the lecturers' focus group confirms with the following statements: "They very keen to assist each other" and "they all helping each other". The students also indicate that there is formal interaction but this limited: only 10% (see Figure 5) indicated on the questionnaire that they had enjoyed having interactions with their colleagues which involves solving mechanical problems. On the informal side only 12% (see Figure 10) of the students indicated that there should be social activities. Both the formal and informal activities are also limited maybe as a result of the duration of the course which is only 10 weeks.

Frequent informal conversations also have an impact on retention of students. In the literature review, Pascarella (1980, p. 549) cites a study by Grigg, who sampled 31 seniors from 31 colleges in 16 southern states in 1965, and suggests that those students who have frequent informal conversations with a faculty member were significantly more likely to graduate on a full time basis than those students who had infrequent contacts or not at all. From my study there is no indication of informal conversations between the student and the lecturers. Again, one of the possible reasons for little informal contact is because the course only lasts for ten weeks and there is very little time for any interaction. In their focus group the lecturers speak about the time factor:

***Resp 1** "Cause we battle to finish the syllabus. So we don't have time really to go back and like a section that hasn't been grasped by the students. It is difficult to waste another lesson to go back and re-teach that section. You have to move on in order to finish the syllabus."*

***Resp 1** It doesn't work because of time. You know. You got to complete certain chapters for control test one (**Resp 2**) To complete the syllabus) then you get through the syllabus **Resp 3** Yeah.*

To explore the type of relationship that exists between students and lecturers as well as among students a question on racism was posed in both the student survey and the focus groups. Here are responses from the lecturers' focus group concerning racism:

Resp 1 *“Not a problem at all.”* **Group Resp** *“No problem at all.”*

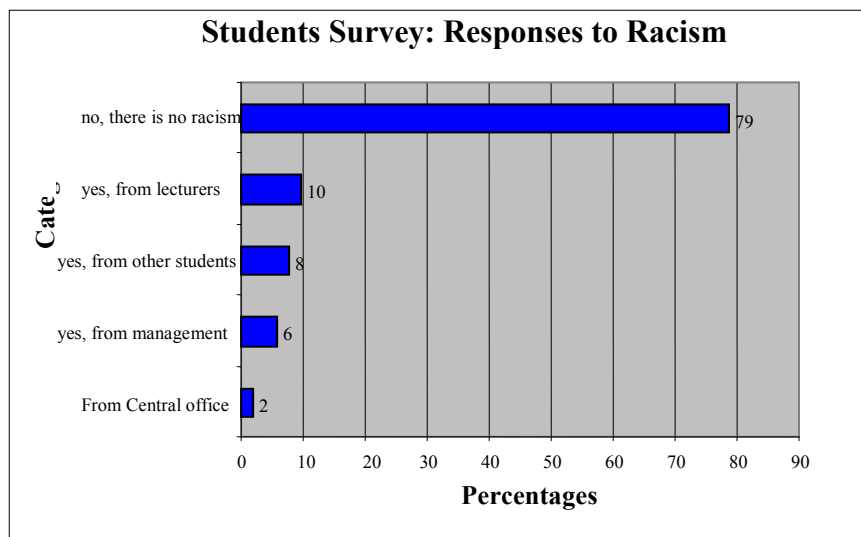
Resp 2 *“I don’t have a problem at all. They all students and they all there to learn. So if a student is sitting in front of me wanting to learn we can work together.”*

From the above response it can be noted that there was no disagreement among lecturers with regard to racism at the FET college. Lecturers felt that racism was not an issue at the FET college.

Information from the students on this issue is mixed. The students' focus group view, mentioned below, matches the lecturers' view that there is a good relationship.

Resp 1 *“We have a good relationship with the teachers. There is nothing wrong.”*

Figure 4



From the student survey the issue of racism shows the following:

Figure 4 above shows a large percentage (79%) of students responded that there is no racism at the FET college and supporting this are similar statements mentioned above

during the two focus groups. At the same time 18% of students indicate that they perceive some form of racism in the institution. To gain more insight into the possible reasons for students who said there was racism on campus, students were requested to describe some incidents of racism. Here are the some of the incidents mentioned:

“No racism but lecturers have a huge attitude problem.” “Not obvious but there is racism between mechanical and electrical students caused by management.” “Poor assistance given to black students.”, “Registration time black students are place in N1 while white students go to N2 with the same matric results.”, “They think black students are stupid.” and “If you are black they don't care.”

Looking at the above incidents mentioned it is worth noting that even though students mention that there is “no racism” they say that the lecturers have an attitude problem or that racism is “not obvious”. Maybe the students have experienced racism but they are being cautious and do not want to expose themselves fully to a person from management. Also reflected in the above incidents is that students are expecting the college to be more caring and supportive by may be taking more time to explain to the students the expectation of the mechanical engineering course

Some students who interact with management may feel that management does not take their needs seriously which results in them seeing management as racists and consequently students state *“Management favours white students.”* or *“If you are black they don't care.”* To further justify their perspective these students look at even advertisements on racial lines; they said: *“College adverts show white and Chinese faces but the majority are black students.”* From my experience as the marketing manager I am aware of the practice at the FET college is that advertisements generally have pictures of almost all race groups and that only one advertisement carried faces of Whites and Chinese only.

Another incident that students mention is *“Zulu boys hit Zulus if they have Xhosa friends.”* This statement shows that students think that their peers are interacting in ethnic

groups and if students do not follow unwritten rules of the ethnic grouping then they are forced to comply by violent means.

Of importance is that a student needs both formal and non formal interaction with lecturers at a college and it is therefore important that both aspects receive attention so that the student is retained. The management of the college needs to recognize this interaction and create an environment for this to occur.

Setting of goals

Tinto (1987, p. 42) cites a survey done by Astin, Hemond, and Richardson in 1982 which concluded that “only a little over one third of them report themselves as being very sure of their educational and occupational goals.” Supporting this perception is the following lecturers’ statement from the focus group discussions:

*(Resp 6) “And I am not very sure that they got the correct guidance
(Resp 7 hmmm) what they should be doing. So they are told that
they must go to a Technical college or FET College to go and study
but they don’t know what to study. And then they go to a specific
campus and that campus is offering that course, Okay we’ll do that.”*

This shows that some students just go to a campus and do whatever course is available and have no idea or have no clear goals. Further confirmation of this behaviour is obtained from data gathered from the student survey which shows that 10% of the students indicate that no other course was available during registration and therefore they chose mechanical engineering (see Figure 3). In the lecturers’ focus group they mention the following:

*Resp 9 “Students are applying at specific institutions and they can’t
get in. So then they fall back to FETs. Now we must please
accommodate them. And they don’t necessarily really want to be
here.”*

Lecturers' believe that the FET college is the student's last choice to study after they have been refused entry at other specific institutions such as universities and private colleges where the entry requirements are much stricter. So they come to the FET college because they have nowhere else to go and this forces them to enroll for any course that is available. As the lecturers mention in their discussion they think that these students do not want to remain at the FET college but are just buying time until they decide their future goals. As soon as another opportunity arises at the other institutions the lecturers' perception is that these students leave. Besides having uncertain goals we need to remember Astin's statement that students have "their own goals and plans" Astin, 1976, p. 6). The FET college students may have a range of goals which can be short term, medium term and long term. Some examples of different types of goals that were mentioned during the students' focus group discussion appear in italics hereafter. Short term goals are shown when students say that they do the mechanical engineering course so that they can leave at the end of the first trimester, for example, *"I want to go to DUT"* *"I wanted to do civil engineering and my science was bad and eh they said that I should come to a FET college and get my N4."* A medium term goal maybe something that the student wants to accomplish in a few years time like -*"I want a diploma."* Long term goals are accomplished after many years (generally after more than five years) and here the examples students provide us with are *"I want to open my own business."* and because *"they want additional subjects to complete Government Competency Certificate (GCC)"* (2%) (see Figure 3).

In conclusion the students' decision to stay or leave the mechanical engineering course depends to some extent upon whether they see the mechanical engineering course as short, medium, long term goal. This makes it difficult for the FET college to plan a good the retention strategy because the students will have their own goals and some will leave anyway.

Financing of students

As noted by Bean (2005, p. 234) “Running out of money is probably the best excuse for leaving college that there is, because it places the reason for leaving outside the locus of control of the student. Many students who leave college for other reasons blame their departure on money problems”. My study supports Bean’s statement where 52% of students surveyed indicate finances as the most important factor to stop attending the course (see Figure 1). During the focus group discussions with students lack of finances was the first reason given. The college has recognized the need for financial support by making bursaries available as well as allowing students an installment plan to pay their fees. Recently, in 2007, the college has gained access to the NSFAS bursary scheme as noted in the literature review.

However, in my study the lecturers’ view regarding student finances differs from the view of students. As mentioned by Bean earlier “many students leave for other reasons but blame their departure on finances”. The lecturers seem to support Bean’s statement. Not only is this one lecturer’s view but the entire group agreed:

Resp 2 *“I don’t believe so.”* **Resp 1** *“I don’t think so. No.”* **Resp 3**
“Not such a big factor.” **Group Resp** *“Ja.”*

Lecturers have the impression that there may be other factors that play a role that make a student want to leave early. In the lecturers’ focus group discussions they state that the students had the “*wrong impression*” and “*That it (meaning the mechanical engineering course) is not as simple or easy they thought it would be*”. Lecturers felt the real reason for students to stop attending the course is that they are not coping with the demands of the course. In their focus group discussion the lecturers stated:

Resp 1 *“Some they feel the pressure (Yeah) that the pressure more than they had an idea.”* **Resp 2** *“They also have eh the choice of subjects that they have at N5. At N4 it is straight Mechanos, and*

drafting, and at N5 what are we offering them? It is a choice between the powers, fluids, strengths and it just depends.”

Resp 3 *“It is a very big jump.”*

Resp 4 *“Yup! It is.”*

Results from the student survey also confirm that the students leave because they are not coping with mechanical engineering when 31% state that the some subjects are too difficult and a further 19% leave because of poor results (see Figure 1).

The FET college is aware of the students the financial situation. As mentioned in chapter 1 the college has a relatively low fee of R1710 per trimester when compared to private institutions and universities. The college has also allowed students to pay their fees in installments so they do not have to pay the total amount upon registration. In addition if students still feel that the amount is unaffordable then they can present their situation to the SLO who will then determine a fee that needs to be paid. As the quality manager I am also aware that the Student Support Department manages the processes and recommends bursary applications on behalf of students. According to Mlangeni (2008) 875 students at the FET college qualified for the NSFAS bursary but only 244 completed the necessary documentation despite the numerous efforts made by the college to encourage them to apply. The actions of most of the students do not seem to match the statements made as participants in this study regarding finances. Furthermore at a parents meeting (March 1, 2009), parents were informed by the rector that the students are not paying their fees. Parents were concerned and indicated that they are willing to pay the outstanding fees if they receive monthly statements indicating the outstanding balance.

In conclusion my study shows similar trends to other retention studies that students will **state** finance as the first reason for leaving when there are other possible reasons for leaving.

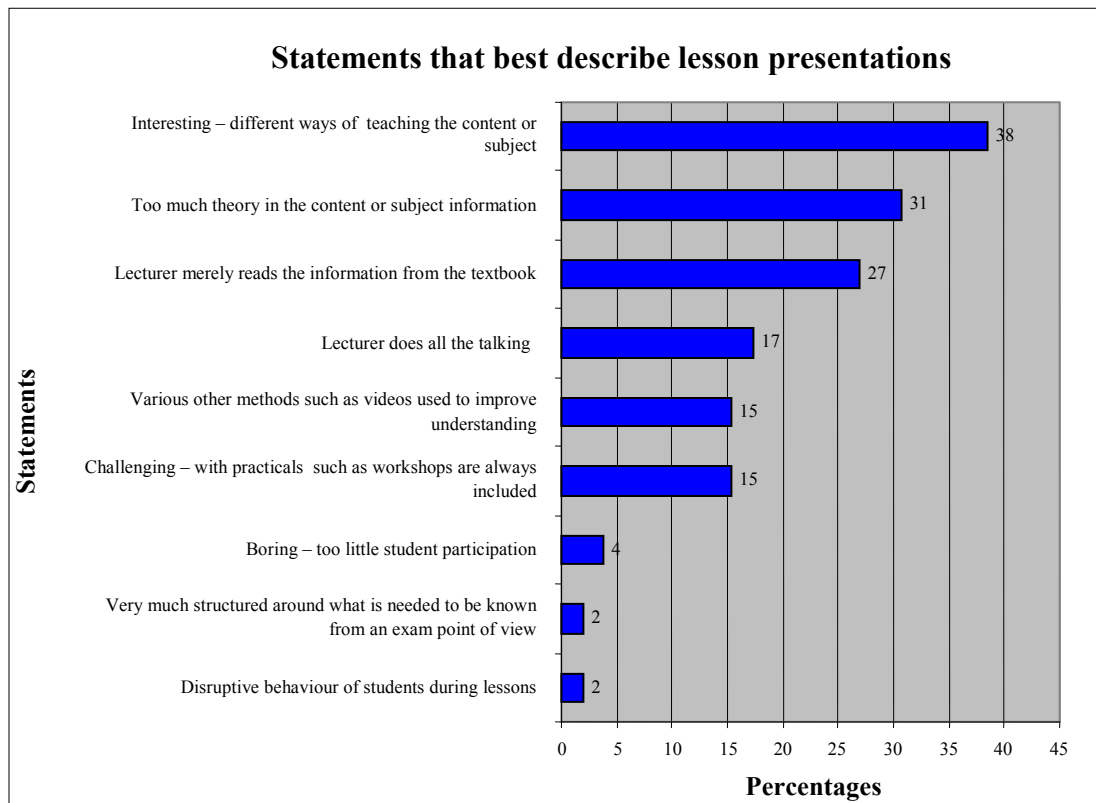
Classroom environment

The classroom is where the interaction between the lecturer and the student occurs and thus this environment plays a crucial role in influencing students to remain or leave the

college. Roueche and Roueche state “The teacher is the key” (1987, p. 283) in classroom environment. At the FET college the lecturer’s task is to create an environment which is conducive to learning. My discussion will cover two perspectives namely good lessons and poor lessons within which the students’ and the lecturers’ perspectives will be considered.

The responses gathered from the students’ survey show that there is a perception that there is a mixture of good and poor lessons in mechanical engineering (see Figure 5).

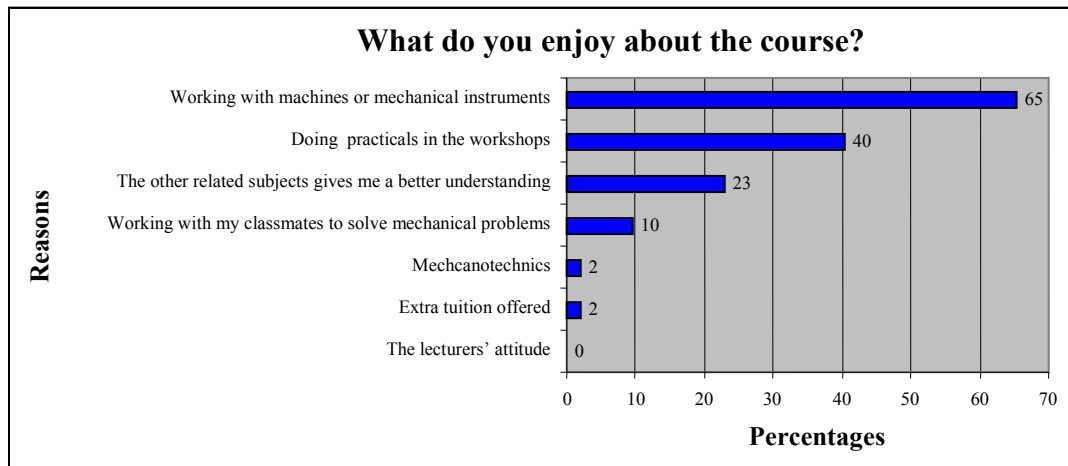
Figure 5



Firstly to understand what make up good lessons, the results of the student survey (Figure 5) were analyzed; they show that 38% of students feel that the lessons are interesting while 15% mention the use videos by lecturers improve their lessons and 15% indicate that lessons are challenging when practicals are included. Also lending support to the report of good lessons is the data shown in Figure 6 where 65% of the students indicated that they like to work with machines and mechanical instruments and 40% indicated that

they prefer doing practicals in the workshops. 2% of students state that one of the subjects they enjoyed is Mechanotechnics.

Figure 6



In their focus group discussions students made the following statement regarding good lessons:

“Resp 1 Science and Drawing. Cause it is interesting. You can see what you are doing.”

Of importance in the above statement is that students mention that they can see what they are doing which helps them to grasp and understand the mechanical concepts. Again, from the lecturers' group discussions it is evident that lecturers who deliver good lessons use different methods to show the students practically the various mechanical aspects. Here is an example mentioned in the lecturer focus group discussion:

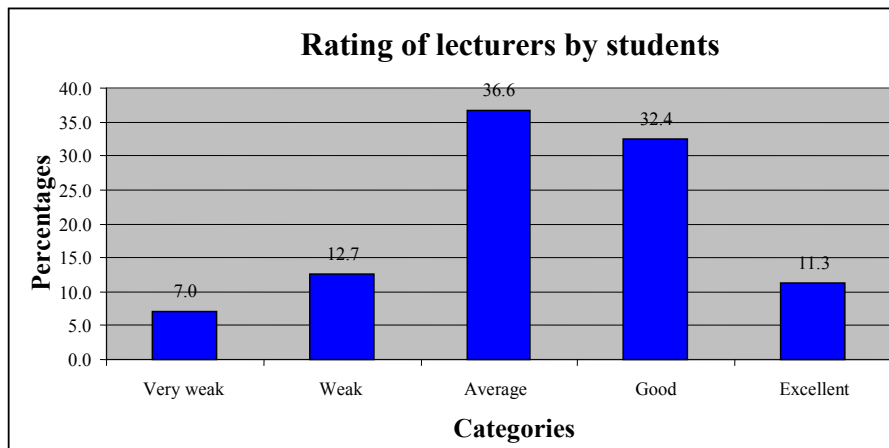
“Resp 2 I tried to bring models into the class and tried to go into the internet and get drawings of the different machinery that are already ...already assembled so that the student can see it.”

Doing practicals helps the student to become an active learner which Tinto and Astin refer to as involvement. Tinto states that “A widely accepted notion that the actions of the faculty, especially in the classroom, are key to institutional efforts to enhance student

retention” (2006-2007, p. 5). Astin also considered involvement as important and so he formulated a theory called the Theory of Involvement.

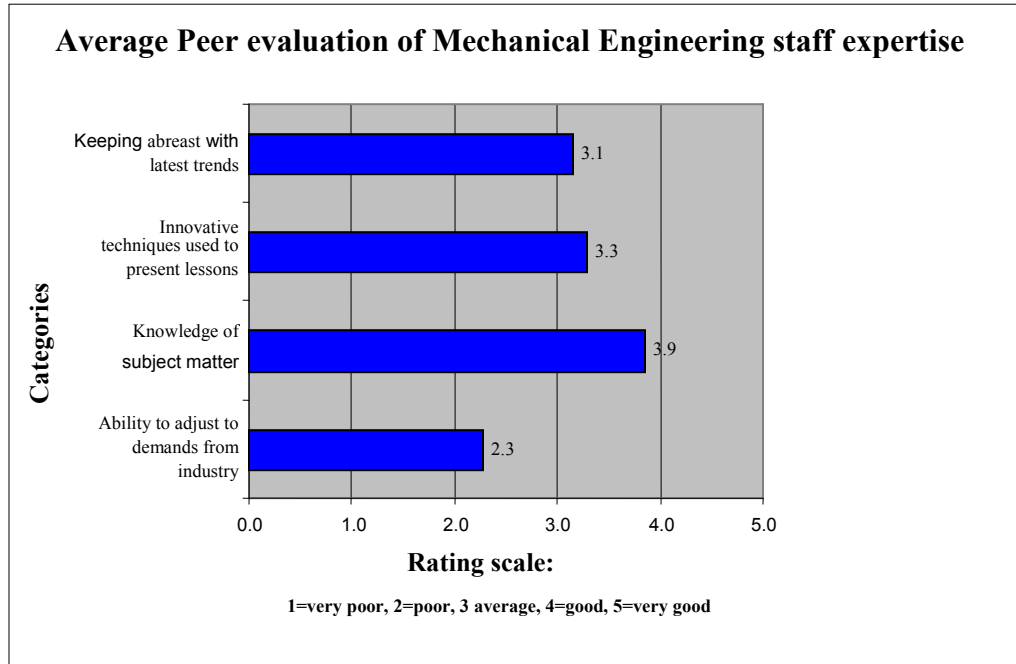
Figure 7 shows students’ rating of their lecturers. Here too there are a range of opinions regarding the lecturers from very weak to excellent. Most of the lecturers are classified as average (36.6%) while 32.4% were grouped as good. Looking at Figure 7 the graph is leaning more towards the upper end of the scale, showing that the students think that there are more good lecturers than bad.

Figure 7



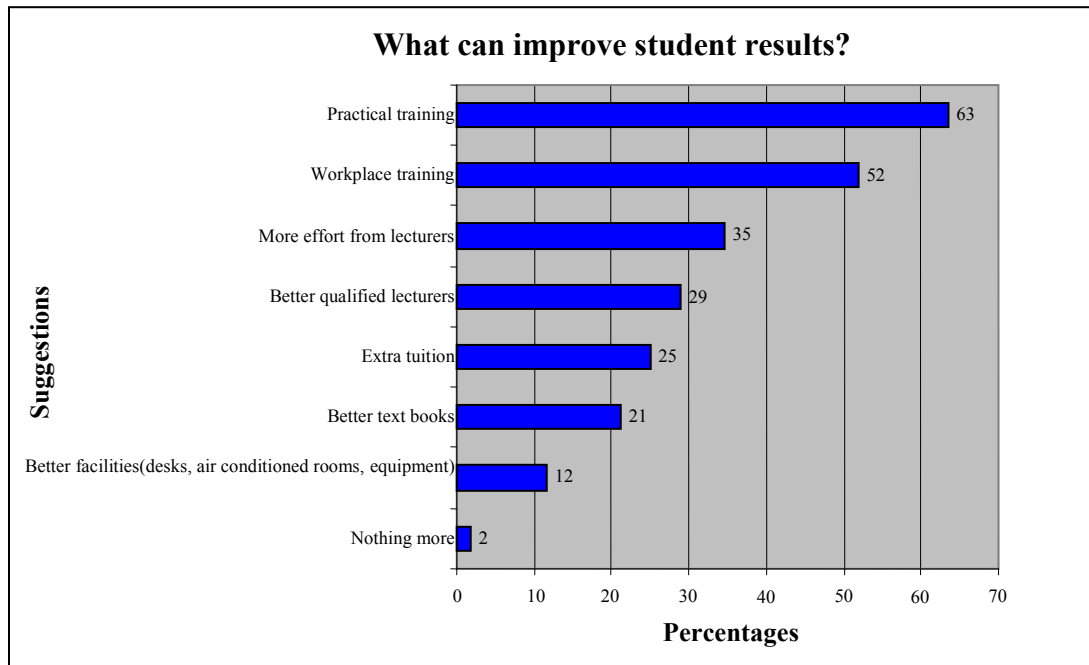
In trying to understand if the students and lecturers had similar views, lecturers also rated fellow mechanical engineering lecturers. This was done at the end of the focus group discussion where lecturers were requested to rate their peers on a scale from 1 to 5 using four categories (see Figure 8). The scores for the four categories were totalled and thereafter an average was calculated for each category. According to scale devised the average category is a score between 3 and 4. The average results (see Figure 8) show that lecturers’ knowledge was rated as the highest (3.9) while innovative techniques used in the presentation of lessons was rated at 3.3.. Both of these categories were therefore ranked as average (see Figure 8) which is in keeping with the students’ view as most of lecturers were scored as average (See Figure 7 average = 36.6).

Figure 8



Secondly, students also indicated that there are lessons of a poor quality. As shown in Figure 5, 31% of students stated that the subject content is too theoretical while 27% stated that the teacher reads from the textbook and 17% indicated that the lecturer does all the talking in the classroom. 4% of students stated that the lessons are boring with very little student participation. Posing a question in the student survey regarding the improvement of their results was another way of checking for consistency in the students' responses. Suggestions students made are shown in Figure 9 below.

Figure 9



It is evident from Figure 9 that the first five suggestions for improvement made by students point to classroom practice. With regard to lecturers, 35% of students responded that more effort is required from lecturers, while 29% of the students indicated that better qualified lecturers are required. Confirmation that students are consistent in their responses regarding lecturers can be seen in information shown in Figure 7 which shows that students believe some lecturers need to improve in their teaching practice. Students' responses regarding some lecturers show that they see 12.7% as weak and 7% as very weak, which is consistent with information shown in Figure 9 above.

Once again 63% (see Figure 9) of students confirm that practical training is most important for them to improve their results. From the lecturers' focus group discussion there is justification for students to request practical training, workplace training, more effort from lecturers and for better qualified staff. Here is a lecturer's own description of his taking students to a workshop:

Resp 3 *“I already took them. The Motor trade theory students to the workshop so that eh I showed them everything like some of them didn’t know the gearbox and types of gears in them and with the mechanism I took them into the Fitting and Machining lab, I ... I showed them everything that we do calculations for.”*

Interviewer: *“have you ever tried to use them or anything?”*

Resp 3 *“We didn’t use them. Luckily last block I had eh one guy who was (cough) working in Fitting and they allowed us at Campus B that he can use the machines. Then he showed us everything. Just taking the work piece and decreasing the “downtar”. He did it by himself cause he worked for that 6 months. (laugh) So he did it himself and showed everything.”*

It is apparent from the above description that (1) lecturer was only showing the students the different types of machines. This means the lecturer was only pointing out the various machines while the students were standing and just looking. (2) the lecturer did not know how to operate the machines; in other words he was under qualified (3) the students were passive, as they did not have the opportunity to interact with the machinery and (4) the student who demonstrated how to operate the machines shows the importance of workplace training. This scenario also highlights the importance of workplace experience as a student was able to demonstrate all the machine operations. Kuh et al (2005) conducted research (2002-2003) involving DEEP colleges in the United States which were chosen as they showed high levels of student retention. One of the strategies used by these colleges was known as Active and Collaborative Learning. This type of learning involved activities such as classroom-based problem solving, peer tutoring, service learning and other community based projects, internships, and involvement in a variety of educationally purposeful activities outside the class. To make the FET colleges capable of conducting more practical training the Minister of Education, Naledi Pandor (2007), announced that R2 billion has been set aside for the fifty FET colleges in the country for recapitalization. These funds will be used for staff training, purchasing new equipment, teaching and learning materials and upgrading of infra structure. In their peer evaluation,

(shown in Figure 8) lecturers confirm that indeed they are lacking in terms of keeping abreast with trends in industry (3.1 which is placed in the average category) and the ability of adjusting to the demands made by industry (2.3 which is placed in the poor category). In the student survey (question 10) students were requested to rate their lecturers and provide a reason. Here are some of the reasons provided by students for rating the lecturers as weak:

“Under-qualified staff, no effort from staff, staff do not teach, and certain subjects lecturers are weak”

The FET college is addressing the need for better qualified staff by sending lecturers for relevant training which is funded through the recapitalization funds. One of the problems that the FET college faces is that once these lecturers are trained then they are poached by industry as they offer better incentives. To counteract this problem the new Further Education and Training Act (no. 16 of 2006) for colleges was passed which makes the college council the employer. This allows the council to negotiate a more lucrative remuneration package with highly skilled persons which will see lecturers remain at the FET colleges. With the old Further Education and Training Act (no 98 of 1998) lecturers were paid salaries according to the Department of Education scales which were not high enough to reward special skills of mechanical lecturers.

An integrated approach to teaching mechanical engineering was suggested by lecturers during the focus group discussion when they stated

Resp1 *“See if you had maths example. Where they tell you calculate the number of teeth in this gear and things like that. Make the examples related to the trade.”* **Resp 2** *“To the trade. Ja.”* **Resp 1** *“It will make more sense to them.”*

Resp 3 *“And I also feel coming back to my subject, like Drawings, if they had more drawings in Mechanos so that they could also*

identify with when they are doing Mechanos book and in the drawing class and then they can see the two are correlating.”

The lecturers see the need for the different subjects to be related to one another which will help the student in understanding the various concepts in mechanical engineering as well as the applications. For this to happen requires team work among lecturers and as the first step the FET college has embarked on the formation of subject committees. At these committees the best practices are discussed and implemented.

An interesting suggestion made by lecturers is that the text books be written in an integrated manner so that students can see the link between them like Mechanotechnics and Drawings.

Besides having the physical resources, the methods that the teacher uses for classroom delivery is also important. As shown in Figure 1, 8% of the students mention that the teacher's method of teaching was not suitable. One of the studies cited by Valverde (1987, p. 87) states that “An alternative method of determining learning styles has been developed by Ramirez and Castaneda (1974). Their work in determining the cognitive learning styles of Mexican-American children is based on earlier research conducted by Witkin and others in 1962, which produced the concepts of field dependence and independence”. “A field independent student prefers independent work, likes to compete and gain individual attention, is task orientated, prefers formal interaction with teachers, prefers learning through the discovery approach and focuses on details of concepts. On the other side, the field dependent student likes to work with and is sensitive to the feeling of others, desires a more personal relationship with teachers, works cooperatively, seeks guidance and demonstration in learning lessons, and focuses on global aspects of curriculum,” Valverde (1987, p. 87). The FET college has students from diverse cultures as well as from different backgrounds. Therefore lecturers should be aware of the different learning styles and adapt the teaching methods to suit the different learning styles as well as the different cultures.

Table 3

Analysis of communication results - November 2006									
Symbol	A	B	C	D	E	F	G	H	Total
Number	1	2	20	41	56	71	49	12	252
%	0.40	0.79	7.94	16.27	22.22	28.17	19.44	4.76	
% Failed									52.38

Highlighting the language issue, the results of the 2006 November examinations at the college show that 52.38% (total of all the red percentages) of the students failed Communication. Even those students that passed obtained symbols of poor quality: 22.22% are between 40% and 50%. This means that 75% of students scored less than 50% in the language exam. Being aware of the language problem I made provision for an interpreter when conducting the student focus group discussion. Only 2% of the students state “I do not understand the language or terms used in mechanical engineering” (see Figure 1) as a reason for not attending but probably many more students struggle on without understanding much. Similarly, only 2% of the students mention that they require support in communication (See Figure 10). The students’ statements indicate that the language problem should not be regarded as serious (only 2% say it is) but as seen in the above statistics (see Table 3) it is clearly evident that there is a language problem at the FET college which is serious.

Academically underprepared students

In the mechanical engineering course the lecturers have ten weeks to prepare the students for national examinations. During their focus group discussions lecturers mentioned that they do not have sufficient time. For example they state:

Resp 1 “ Cause we battle to finish the syllabus. So we don’t have time really to go back and like a section that hasn’t been grasped by the students. It is difficult to waste another lesson to go back and re-teach that section. You have to move on in order to finish the syllabus.”

Resp 1 *“It doesn’t work because of time. You know. You got to complete certain chapters for control test one”*

(Resp 2) *“To complete the syllabus then you got to get through the syllabus.”*

Resp 3 *“Yeah.”*

This means that regardless of the students’ understanding of the mechanical concepts the lecturers’ main focus is on the completion of the syllabus. The lecturer makes it quite clear that it is difficult to waste time or re-teach. So if a student wants clarity on certain mechanical aspects then the lecturer will not be able to assist as the main focus is on syllabus completion. This can create a perception that can be easily interpreted by students that the lecturers have a don’t care attitude. As a result 2% of students mention that lecturers have a negative attitude (see Figure 1).

Under preparedness can also arise from students not having good training in their previous levels. This requires the lecturer to do additional work which means the students have to be taught aspects from the lower levels (N1, N2 and N3). The lecturers indicate how impossible the task becomes by stating:

Resp 2 *“I am teaching them N1, N2, and N3 in three months. That’s almost impossible. So the students do get disillusioned and get into a panic.”*

Resp 2 *“So I am basically trying bring in all the N1 and N2 knowledge into the classroom by me actually physically drawing for them so that they see what is happening.”*

Resp2 *“And even in the Maths and Science they are lacking. (Resp 3. They are battling.) They are battling. Even those that have higher grade matric maths and physics”.*

The lecturers’ emphasize *“They are battling”*, meaning that the students are not coping with the demands of the course even though they have the right perquisites like higher grade mathematics and science. By requesting for extra tuition the students show that

they know that they are underprepared and believe that this can assist them to improve their results. Figure 10 shows that students see extra tuition as the most important student support service (60%) while Figure 9 also confirms this when 25% of the students indicate that extra tuition will help improve the results. While students are requesting extra tuition a further problem indicated in the lecturers' focus group discussion is non attendance of these tutorials when provided.

***Resp 2** Also, the people that pitch up are the ones don't need the help. The ones who need really need help (**Resp 3** yeah the ones who are ..who are not good enough they don't pitch up for these tutorials.) Yes Ja..*

Another concern that lecturers raised in their focus group discussion was student absenteeism which they believe affects student preparation.

***Resp 2** "Another thing that I find with students and maybe student support can also look at is that we have a large number of absenteeism (**group resp** "Ja, yup") and that influences your results (**Resp 3** "of course it does") because you can't, I mean, we have had we've had 7 or eight weeks for this block which was extremely short (**group resp** "Extremely short, Ja") and then we got three or four weeks of student absenteeism."*

The lecturers are concerned that there are a large number of absentees during this short course. All the lecturers agree that time is extremely short and the students who are frequently absent are further disadvantaged as they will not be able adequately prepared for the national examinations.

Black or disadvantaged students

One of the statements given by a student regarding racism in the student survey reflects the feelings of black students when they attend a FET college.

“They think black students are stupid.”

As noted in the literature review one of the aims of Bantu Education was to provide education that would supply cheap labour to industries. In other words the black African students were made to believe that they could only become labourers and that they cannot think. From the statement made above it shows the effects of Bantu Education implemented during the apartheid era is still in the minds of students today.

Sadly the end of apartheid has not signaled the end of poverty for Black South Africans, and currently, many Black Africans are still experiencing high levels of poverty which has led to black African students requiring financial support. To address the lack of finances has resulted in the government establishing a bursary fund for FET colleges which was announced by Minister of Finance, Trevor Manuel, in his Mid Term budget Speech: 25 October 2006.

Where students mention *“White lecturers blame black students and visa versa”* as one of the reasons for racism, then there is a possibility that students and lecturers from different cultures and race groups are misunderstanding each other. Tierney (1992, p. 608) states that “Up until very recently in American higher education, colleges and universities were designed to educate a clientele that was overwhelmingly composed of white males who came from the middle and upper classes”. Tierney (1999, p. 84) conducted research with Native Americans meaning Indians where he mentions in the American society the dominant culture is white and the minority Native American group is forced into this white culture even at educational institutions. In the post apartheid era the FET college has continued to follow a dominant white culture but in the meantime the student profile has changed to majority of black students. As Tierney (1999) mentions Bourdieu (1986) coined the term “Cultural Capital” and he explains that cultural capital refers to the set of linguistics and cultural competencies that individuals inherit or sometimes learn. Also according Lovell (2000, p. 26) Bourdieu also used term “habitus” that means “ways of doing and being which social subjects acquire during socialization.” If students and lecturers understand the different “cultural capital” and “habitus” then there will less likelihood of them blaming each other. As Tierney (1992, p. 616) suggests, instead of one

culture dominating, we should build our colleges on understanding of all cultures so that we are all empowered and emancipated.

Lecturers believe that students require some support for them to cope with the course. Apart from college support, students need other support like from their families. The lecturers stated:

Resp 2 *“They got a support system somewhere where.. father is in the industry or...”*

Resp 3 *“Some of them got the family pressure. When they get home the parents ask them to do the home work and those ones not staying with their parents they got a problem because they tell themselves. They tell themselves that I going now ..I am not going to do homework, I am not going to do anything I am just gonna sit and relax. No.. Nobody is pressurizing them to do their work. So that is why some of them are having problems.”*

As a consequence of apartheid many of the African blacks were denied the opportunity to study at higher institutions and therefore it is unlikely that many black parents can give additional academic support or guidance to their children. Therefore black students are expecting more support from the lecturers but this is not happening as lecturers do not have the time to help these students. Consequently students believe

If you are black they don't care.

Poor assistance given to black students.

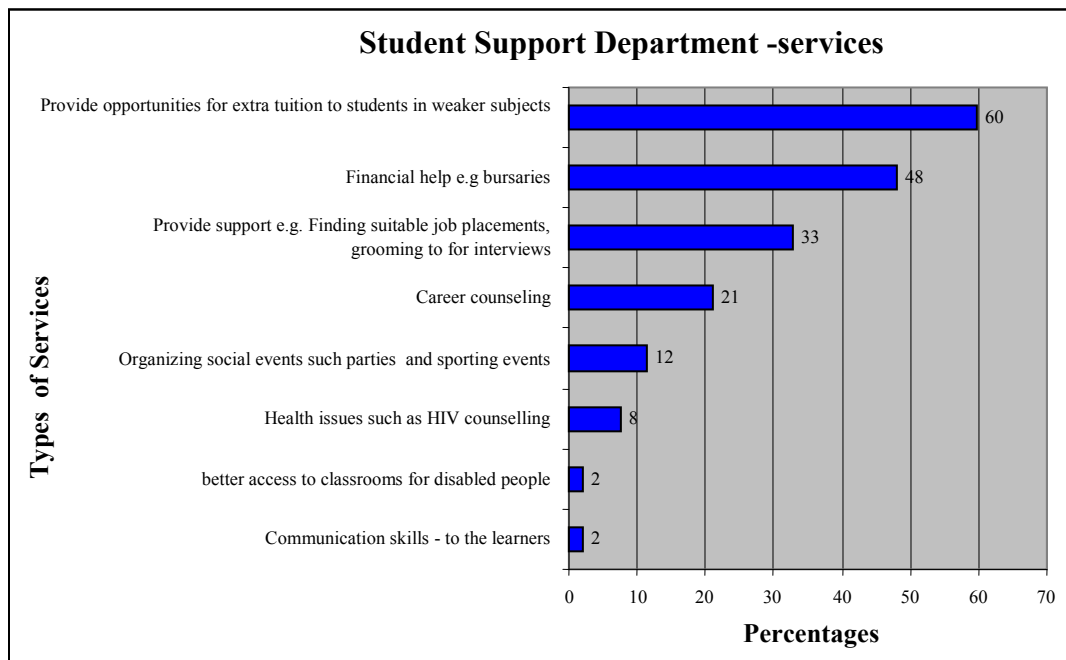
Black students do not only have a problem in South Africa but also in other countries like United States of America. Townsend expresses concern that the black students were encouraged to enroll at institutions but thereafter were forgotten and left to fend for themselves. Dr. Clinita Ford, Director of the National Conference on Retention stated “As a result, black students are still “dropping out like flies” (Townsend, 1995, p. 85).

Support for black students is important as Townsend states that Grambling University is one of many Historically Black Colleges and Universities (HBCU) which was able to attain the highest retention rate by having a good support system despite having an open admission policy with a large number of students from the low income group. According to their president Harold Lundy, “The real key is to convince young people that they have the ability to succeed” (Townsend, 1994, p. 86).

4.5. Student Support Department

Figure 10 (below) shows in descending order a range of services that students indicate that the Student Support Department can provide. 60% of the students believe that the most important support that they require is extra tuition and this is probably because ten weeks is too little time for the students to be adequately prepared. Yet, as discussed earlier, lecturers note the poor attendance by weaker students in tutorials. This seems to contradict the students’ call for extra tuition. When the lecturers do make time for extra tuition the weaker students decide that they are not going to attend. Consequently these students perform poorly which ultimately impacts on student retention.

Figure 10



Again 48% of students highlight the need of financial assistance which correlates with the most important reason provided by students for leaving.

Workplace placement is important to students who want to qualify for their diploma in mechanical engineering which is only possible if they have a minimum of two years relevant workplace experience. Students need the Student Support Department to assist them to access the employers for workplace experience. In addition students need support in preparing for job interviews so that they are successful in attaining jobs. Not surprisingly 33% of students rank assistance with job placement as the third most important support service (see Figure 10).

Frost, (1991, p. 30) points out that “Motivation is the primary focus of academic advising”. Also, Bean states “Many students use poor advising as an excuse for leaving” (2005, p. 226). One aspect of advising is career guidance. Hence, career counselling was ranked as the fourth most important student support service with 21% (Figure 10). Also, college career counselling only influenced a very low percentage of students (6%) to choose mechanical engineering (Figure 3). During the focus group discussion with lecturers the issue of career guidance was debated strongly. Some of the lecturers felt that career guidance at the college is not very good. Here is an extract from their focus group discussion.

Resp 6 *“And I am not very sure that they got the correct guidance. (Resp 7 “ hmmm”) What they should be doing? So they are told that they must go to a Technical college or FET College to go and study but they don’t know what to study. And then they go to a specific campus and that campus is offering that course, Okay we’ll do that.”*

Resp 6 *“I believe that’s a problem as well with regards you talk about mechanical engineering over here, there is no form of..of eh um student advice or vocational guidance, put it that way, at this*

campus. You find, and I've done this many times at registration, that a student pitches up, and virtually every lecturing staff member says, Well! What do you want to do? And they say I want to do electrical engineering or mechanical engineering and they simply get put into it without um being given advice (Resp 7 "Career guidance") whether they should be chef or a nurse or whatever it might be. To a large extent this institution really wants to get more and more students (cough) enrolled without actually gauging whether they should be really here or not in the first place." (Resp 8 "even if they don't have the ability"). (Cough) Exactly! Exactly! Ability... ability and the ...and the attitude at the end of the day. That is probably eh ...eh a problem throughout education institutions generally in this country. I believe that all institutions just try and get numbers without really considering whether the student is correct for the course that is being offered."

At the same time some other lecturers believe that there is an element of good career guidance offered at the FET college and they state

"Not all the time huh eh like I have also experienced that at Campus B. You get some of the lecturers that know the courses that are being offered and they can give good guidance to students. And I think that some like the new guys they don't have a clue about certain courses that are being offered."

The lecturers suggested that career guidance can be done during registration as follows

"So what I see eh at time we enroll we need to have maybe two or three areas where we really have experts who will explain to students that wah wah wah what you want is this and this and this and this depending on what the students knows about that career."

Seidman (2005) argues strongly that career guidance should not be a once off event but rather it should be continuous process. He cautions educators when he states “Start a career exploration process early on and do not assume that a student knows what he/she wants to do simply since he/she chose a major” (Seidman, 2005, p. 49). Also, in the discussion on career guidance it is noticeable that the lecturers want to begin with career guidance only during registration which is not in keeping with Seidman’s (2005) suggestion of a continuous process. However, lecturers seem to understand that career guidance is not the function of the Student Support Department only, and that they should also be involved in planning the students’ career. Astin confirms the importance of involvement when he states “Learning, academic performance and retention are positively associated with academic involvement, involvement with faculty, and involvement with student peer groups” (Astin, 1996, p. 394).

According to the model formulated by Tinto (1987, p. 113), the social and intellectual context of the institution and the formal and informal interactional environment plays a central role in the longitudinal process of individual departure. Astin (1996) refers mainly to academic involvement as a form of interaction whereas Pascarella (1980, p. 549) cites a study by Grigg, who sampled 31 seniors from 31 colleges in 16 southern states in 1965, and suggests that those students who have frequent informal conversations with a faculty member were significantly more likely to graduate on a full time basis than those students who had infrequent contacts or not at all. At the FET college the Student Support Department has employed student liaison officers (SLO) who plan some social activities and academic activities like extra tuition. Due to time constraints not many social activities are planned. But only 12% of the students consider social interaction at FET college as important (Figure 10).

The students also state that they require support on health issues like in HIV counselling (8% -see Figure 10). Students who are sickly tend to be frequently absent and consequently they may be regarded as “dropouts”, or “stopouts” or “attrition”. The SLOs are not qualified counsellors but do refer students for counselling when the need arises.

The lecturers suggested in their focus group discussion the following student support services in addition to those mentioned in Figure 10.

“Preparing of students for the workplace such as having mock interviews and CV writing.”

“Form links with industry for job placement and workplace experience.”

“Tracking students after they leave the college and create a database.”

“Follow up on students who are absent.”

The student support system is fairly new to the FET college which began in 2003. After almost 5 years students do not know much about the Student Support Department. This is a statement made by a student during the discussion

Resp 2 *“Honestly speaking I never knew about student support at this campus since I have been here. I never knew about it.”*

In conclusion, the Student Support Department is still a relatively new concept at the FET college but looking at the role of both the students and staff attach to this department I think that **it is** going to play a more important role in a student’s career in future.

4.6. Conclusion

My research has highlighted certain elements that are important in student dropout/retention which are common to many educational institutions. Firstly, the students need motivation which primarily occurs in the class through experiencing good lessons. Good lessons need a strong element of involvement. Secondly there is a need for good guidance to be given to students and this guidance has to be continuous. All persons working at the college should be involved with guiding and assisting the student. Thirdly, students need more support before, during and after they finish the course so that they can apply their knowledge and obtain jobs. As the lecturers have pointed out during their focus group discussions, the aim of the college should not be to get a large number

of students but to sincerely help the student to develop a career path. The FET college has a new mechanical engineering curriculum which was drafted by the Department of Education at NQF level 5 to be implemented in the year 2010. According to SAQA regulations the new mechanical engineering curriculum can only be offered in partnership with a Higher Education Institution. The new curriculum will be quality assured by the Higher Education, and this will pose different problems around the costing of the course, the educational level of staff, staff development, employment of staff, physical resources and classroom practice.

Chapter 5 Concluding remarks

In my research I have chosen to investigate whether there was a dropout/retention of mechanical engineering students. To understand the dropout/retention of mechanical engineering students, three aspects were considered namely:

- (1) Students' motivation to study mechanical engineering.
- (2) Factors affecting retention.
- (3) Staff and students' perceptions of the Student Support Department.

The above three aspects will be discussed.

The strongest motivational factor for students is the employment opportunities in mechanical engineering, which is an example of what motivational theorists have termed as extrinsic motivation. However, although extrinsic motivation plays an important role, some students study mechanical engineering because they like to do so which is an example of what motivational theorists term intrinsic motivation. However, as in the Expectancy for Success Construct Model (Pintrich & Schunk 1996) my research shows that motivation is not sufficient to retain students. The challenge in retaining students comes from trying to sustain a high level of motivation of students throughout the mechanical engineering course. This depends on the support from the community, parents, teachers and counselors. Furthermore, one of keys to retention of students, as Tierney (1999) states, is that there has to be a learning culture at an institution which can be developed when parents play an active role for example by interacting with the institution. This the college has identified as a strategy by having regular parents meetings as well as establishing Student Support Department on all campuses.

Sometimes the students are motivated but there are other factors that play a role in determining a students' continuation or early departure from the FET College. An instance is the interaction the students have with staff and other students. At the FET college my research shows that in mechanical engineering the interaction is formal between the students and lecturers, and occurs mainly in the classroom. But as Tinto's (1987) model suggests, for an effective learning culture there needs to be both formal and

informal interaction between students and lecturers. However, due to time constraints the lecturers are primarily concerned with the formal aspects. If there was more informal contact then probably the lecturers would be able to obtain information about students that could assist them in understanding students better.

Understanding the students' goals for studying mechanical engineering is important as this can determine the retention strategy that the college will employ. As Astin (1976) mentions, students may have their own goals which may not necessarily match the FET college's goal of having them complete the three levels (N4, N5 and N6) in the mechanical engineering course to obtain a national diploma. In my research students also indicated that they have their own goals, for instance they may want to transfer to other institutions, or want to enter the labour market.

One of the biggest challenges facing students and lecturers alike is the consequences of the apartheid policy in South Africa, particularly in regard to the long term effects of the deliberately inferior education given to black people. This policy has resulted in many students being disadvantaged, and the disadvantage continues to be inflicted on learners in many predominantly Black schools as they are taught by teachers who themselves are products of this inferior education system. This is especially so for the black African students who form the majority of the student population at the FET college. As the lecturers state, these disadvantaged students do not have a strong background in mathematics and science. Because of this they are unable to cope with the demands of the mechanical engineering course and ultimately this results in students leaving the college. Hence the students require extra tuition to help them to cope with the course. Another consequence of apartheid education which shows in my research is that black African students believe that lecturers perception of them is that "*blacks are stupid*" when they find that they are unable to cope with the demands of the mechanical engineering course. Linked to this is the language issue: for the majority of black students, English is a second language and not well understood, and as a result they may not understand the lecturer's explanation of complex mechanical concepts. Another

aspect that is worth noting from my research is that there is still an element of racism at the college although only 18% (see Figure 4) of the students indicated this.

My research echoes that of leading retention researchers in showing that the classroom is where the student is made or broken by the way the lessons are presented. If a student does not enjoy the lessons then the student will decide to leave the course. From research carried out in DEEP colleges and Astin's Theory of Involvement which suggests that those lecturers whose teaching style allows students to be active learners then the lessons become enjoyable for students which can result in greater student retention. My research shows the same thing.

The students and lecturers agree that besides using models, videos and pictures, there should be more practical training. One aspect that students stressed is that in practical training "they are able to see what they are doing." Another positive aspect of practical training is that while they watch what the lecturer is demonstrating, the students begin to understand the various mechanical concepts and thereby language barriers to learning are overcome. Currently, the mechanical engineering staff members are presenting their lessons in the classroom with occasional visits or tours to workshops. Even when the students visit the workshops, the lecturer is often not skilled enough to use the equipment. Practical training is much more demanding than theoretical explanations in that there is a need to have the right equipment, trained staff, and finance. Also the curriculum has to be revised so that more time is allocated to these courses so that there is sufficient time to practice skills. Currently I am aware that the FET college curriculum is being revised and the suggestions made by lecturers and students are considered especially with regard to practical training. To assist the FET college in offering more practical training, the government has allocated recapitalization funding to the college which has to be used for infra-structure, equipment and staff development. Using this funding many staff members have attended training but a problem that ensues is that these lecturers leave the college and go to industry where the remuneration is higher. This then creates a vacuum as a new lecturer has to be trained. With the new Further Education and Training act no 16 of 2006

the college council is the employer and they can negotiate remuneration with staff, and not be bound to notches set by the Department of Education.

Looking at my research it agrees with Bean's (2005) statement that finance is the most frequent reason given by students to leave the college. Compared to other institutions that offer mechanical engineering the college prides itself in charging a very low fee (for instance R1710 per trimester in 2007). To assist students further, this amount can also be paid in installments. Although, this is a low fee, many poor families may still not afford this fee and therefore there is a possibility that some students do leave the FET college for genuine financial reasons. Bean (2005, p. 234) also states "Many students who leave college for other reasons blame their departure on money problems." In my research the lecturers support Bean's idea that the students have other reasons for dropping out of the course but that they choose to blame their finances. In accordance, Tinto (1987, p. 158) states "For most students, persistence is more reflective of the character of their social and intellectual experiences on campus than it is of their financial resources". Although there are many views regarding students' finances the government has decided to provide FET college students, from 2007, access to the NSFAS bursary scheme to help students with their finances. According to Mlangeni (2008) a full bursary covers a student's books, accommodation and transport. The amount granted varies for each student depending upon the student's financial situation. Mlangeni (2008) mentions as an example where 875 students at the FET college qualified for the NSFAS bursary but only 244 completed the necessary documentation despite the numerous efforts made by the college to encourage them to apply. The actions of most of the students do not seem to match the statements made as participants in this study regarding finances. Maybe this aspect requires further research.

Under-preparedness among students will always negatively affect the FET college's retention of students in mechanical engineering. As mentioned earlier the majority of students are black African students who were severely negatively affected by the apartheid education policy and consequently are under-prepared to meet the demands of the mechanical engineering course. Compounding the retention of students is the issue

that the course is only ten weeks long which does not allow the student sufficient time to gain the skills and knowledge that they should. My research indicates that students believe that extra tuition will assist them to be better prepared but extra tuition sessions are poorly attended especially by students whose performance is poor.

The college does not have good student retention in mechanical engineering and therefore there is a need for the Student Support Department. My research shows that both students and lecturers feel that Student Support Department is critical to the FET college. Tinto (1987, pp. 180-181) suggests “ An institution’s capacity to retain students is directly related to its ability to reach out and make contact with students and integrate them into the social and intellectual fabric of institutional life. It hinges on the establishment of a healthy, caring environment which enables individuals to find a niche in the social and intellectual communities of the institution.” A student participant in this study wrote “*If you are black they don’t care*”. The key support that students say they want is a caring environment where students feel that they can be integrated into the college life, and the Student Support Department can play a leading role in enabling this to happen. Lecturers and students interviewed in my research identified the following services that will show that the FET college cares about the students welfare:

Good career guidance.

Organized workplace training for students.

Liaison with industry, parents, counselors, lecturers and students.

Tracking of what happens to students once they complete the course.

Follow up on absenteeism.

Provision of financial support.

Provision of counselling services.

After conducting 62 tests using the inductive method of research, Braxton and Hirschy (2004) were able to identify three empirical generalizations namely (1) commitment of the institution to student welfare, (2) Institutional integrity and (3) Communal potential. One of their generalizations indicated that commitment of the institution to student

welfare is important and this they stated is displayed by the caring manner in which faculty, staff and administrators interact with students. From my experience at the FET college the students do receive support but in a very unco-ordinated manner, like extra tuition that students participating in my research indicated that they required to improve their results. To try and make all departments work harmoniously towards a common goal, in 2008 the FET college developed a strategic plan involving all the departments in which each department shows its contribution to the college's common goal.

Finally, Seidman (2006, p. 32) reminds the FET college educators of the consequences of just recruiting students for the sake of meeting our targets. "Do not recruit students to your campus who will not be successful unless you are willing to provide programs and services to overcome deficiencies. Philosophy does not have to follow finance."

In the end a great deal of research conducted in student retention, as well as the anthropological studies conducted on groups where there are no drop-outs, show that the most common factor in retaining students is the support they receive. My research has revealed the same pattern at the FET college at which it was based. This support must be provided by everyone involved with the college, namely community, faculty, administrators and family, and the most critical aspect is that when support is being provided, everyone understands the common goal. In 2008 the college had a strategic planning workshop where all the departments were invited to plan the goals for the FET college. This helped in making all staff members aware of their roles and responsibilities in achieving the common college goals. The college uses parents meetings to make parents aware of the college goals and explains their roles and responsibility as well as the need for them to play an active role in the FET college. To sustain the interest of the parents and the community the Student Support Department should play a crucial role in the future. Kuh et al (2005) state that ultimately the FET College has to create a culture inside and outside the college that helps to address the student retention or dropout.

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9. Annexures

9.1 Questionnaire

Questionnaire

Purposes: To understand

- (1) Your reasons for choosing mechanical engineering
- (2) Your reasons for continuing or dropping out of mechanical engineering
- (3) Your perceptions of the Student Support Department.

For each of the following questions tick (✓) the appropriate box or boxes.

Indicate with a tick (✓) which group you belong to

N4	N5	N6
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1. *What made you choose the mechanical engineering course?*

Career guidance at school	
Career guidance at the college	
Friends that choose the same course	
Parents influenced you	
Employment opportunities in mechanical engineering	
Referred by University or Technikon	
Teacher influenced you	
No other course available when you were registering	

Any other reason(s) not listed above

2. *What do you enjoy about the mechanical engineering course?*

Working with machines or mechanical instruments	
Doing practical in the workshops	
Working with your classmates to solve mechanical problems	
The lecturer's attitude	
Extra tuition offered	
The other subjects related to the course gives you a better understanding	

Anything not listed above

3. *What do you dislike about the mechanical engineering course?*

Too much homework	
Too little time to practice in workshops	
Other subjects in the course are difficult to understand	
Lecturer's attitude	
Language used	

Anything not listed above

4. *What will make you want to complete the mechanical engineering course (to the N6 level)?*

You enjoy working with mechanical items	
Better job opportunities	
Workshop practicals are interesting which gives you a better understanding	
To obtain a national diploma in mechanical engineering-which includes experience.	
You enjoy the course- lessons are interesting	

Any other reason(s) not listed above

5. What may cause you to drop out or stop attending the mechanical engineering course?

Poor results	
Some subjects are too difficult	
You do not understand the language or terms used in the mechanical engineering field	
The methods used in teaching the subjects is not suitable to you	
Financial problem	
Health problems	
Personal problems at home	

Any other reason(s) not listed above

6. Do you think there is racism on campus?

no, there is no racism	
yes, from other students	
yes, from lecturers	
yes, from management	
List any other source not mentioned above	

If **yes** can you describe some incident(s)

7. In your opinion, to obtain good results in mechanical engineering you may need:

Nothing more	
Extra tuition	
Better qualified lecturers	
More effort from lecturers	
Better text books	
Better facilities(desks, air conditioned rooms, equipment)	
Doing practical training	
Include workplace training	

Say more

8. Which statement best describes the presentation of lessons?

Interesting – different ways teaching the content or subject information	
Challenging – with practicals - such as workshops are always included	
Too much theory in the content or subject information	
Lecturer does all the talking	
Boring – too little student participation	
Lecturer merely reads the information from the textbook	
Various other methods such as videos used to improve understanding	

Any other reason(s) not listed above

9. What service(s) should the Student Support Department offer?

Financial help e.g. bursaries	
Organising social events such parties and sporting events	
Providing opportunities extra tuition for students in weaker subjects	
Career counseling	
Provide support e.g. Finding suitable job placements, grooming to for interviews	
Health issues such as HIV counselling	

Any other services not listed above

10. Using the scale below please rate your lecturers in mechanical engineering. (Tick (✓)the appropriate box.)

1. Very weak	2 Weak	3 Average	4 Good	5 Excellent

Give reasons for your answer

9.2 Focus group - Topics for Discussion - Students

A. Can we discuss the reasons for students to choose to study mechanical engineering.

Prompt Questions

1. Discuss what makes studying mechanical engineering exciting?
2. Tell me what are your goal(s) or aim for studying mechanical engineering?

B. Can we talk about a lesson in mechanical engineering .

Prompt Questions

3. Lets talk about the language used by the lecturers during the lesson.
4. Tell me about the teaching methods used in mechanical engineering.
5. Lets talk about the facilities the college has provided to make the environment suitable to learning.

C. Can we talk about the relationships that exist with your fellow students in the Mechanical engineering class.

Prompt Questions

6. Describe how fellow students approach each other for assistance in understanding the lesson.
7. Tell me about the racial attitudes of students in your class.
8. Lets talk about any incident(s) of negative racial attitudes that occurred.
9. lets talk about the culture that exists in the class.

D. Lets talk about the reasons for you to complete the course up to N6 level.

Prompt Questions

10. Lets discuss the factors that would motivate you finish the mechanical engineering course up to N6 level?

E. Lets talk about the reasons for students not completing the mechanical engineering course up to the N6 level

Prompt Questions

11. Lets discuss the factors that would result in leaving the course.

F. Lets talk about the Student Support Department at the college.

Prompt Questions

12. Lets discuss the tasks of the Student Support Department.
13. Lets talk about the services available from the Student Support Department.

9.3 Focus group- Topics for Discussion – staff

A. Can we talk about what motivates the students to enroll mechanical engineering.

Prompt Questions

1. Tell me the reasons for the students to enroll for mechanical engineering.
2. Lets talk about the career counseling that students receive upon enrollment.

B. Lets talk about the ability of your students in the mechanical engineering course.

Prompt Questions

3. Lets talk about the strategies used to cope with students who are not performing up to the required standard.
4. Lets talk about the barriers or difficulties encountered in teaching mechanical engineering.
5. Lets talk about coping with these barriers or difficulties encountered in teaching.

C. Lets talk about the methods/techniques you use to keep the students interested in the lesson.

Prompt Questions

6. Lets talk about the practical work that students have to perform any.
7. Lets talk about inviting experts to address students especially innovative techniques.

D. Lets talk about the factors that contribute to students completing this course up to N6 level.

Prompt Questions

8. Lets discuss the type of students that are most likely to be successful in your mechanical engineering course?

E. Lets talk about the factors that you think contribute to students dropping this course.

Prompt Questions

9. Lets discuss the type of students have the least likely to be successful in your mechanical engineering course?
10. Lets talk about students who have dropped out or do they come back at a later stage to complete the course

F Lets talk about the relationship among students in your class.

Prompt Questions

11. Lets discuss the racial relationships of students in your class.
12. Lets talk about any experience any racial disharmony.
13. Lets talk about the culture that exists in the mechanical engineering class

G Lets talk about the Student Support Department at the college.

Prompt Questions

14. Lets discuss the roles or functions of the Student Support Department at the college
15. Lets talk about any interactions or experiences with Student Support Department.

H Complete the document below

16. Use the scale below

1= very poor 2= poor 3 = average 4= good 5 = very good

to rate the level of expertise/quality of teaching on the campus according to the following criteria

categories	Ability to adjust to demands from industry	Knowledge of subject matter	Innovative techniques used to present lessons	Keeping abreast with latest trends
scores				

9.4 Participation letter

179 Brixham Road
Orient Heights
PIETERMARITZBURG
3201

16 June 2007

Dear Participant

Participation letter

Thank you for volunteering to be participant in my research.

Please be informed that I am conducting research for my masters degree. All information gathered will be kept confidential.

The results of my research will be available from the University Library once the examination process has been completed.

During the presentation of my research no names will be mentioned which will then guarantee that no harm will come to you.

Only persons who have direct interest in my research will have access to the information gathered which will be my supervisor.

You have the right to withdraw as a participant at any time.

Thank you for your time

Yours faithfully

R. Maharaj
033 341 2131
082 457 3967

Supervisor
Ms Sandra Land
University of KwaZulu-Natal